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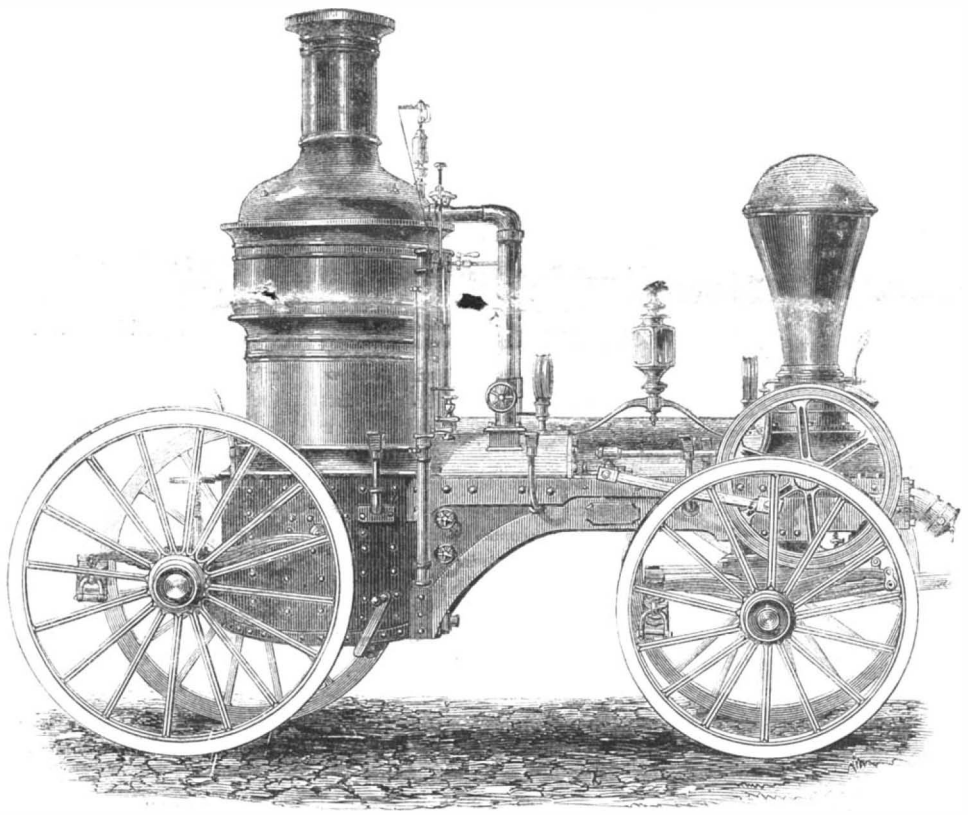
STEAM FIRE-ENGINE FOR RUSSIA.

Owing to the great number of wooden structures which were originally erected in the cities and villages of our country when it was new and timber so abundant, their combustible character naturally led to frequent and extensive conflagrations. To prevent and mitigate such evils, the energies of our people were aroused, and their natural mechanical genius was excited; and as a consequence, they became the inventors and builders of the most efficient hand fire-engines in the world. These were divided into several classes, and with some variations, generally consisted of two upright pumps, situated opposite one another, at the rear of a long water box placed on a carriage, and connected with a suction pipe behind and a discharge pipe before leading through an air-chamber to the hose and nozzle. The pumps had two valves—an inlet and discharging one. Some of these were furnished with springs, but the most common kind were simple flap valves. The suction valve opened into the cylinder, the discharge one opened outwards, thus forming a force pump. The two pumps were operated by a long horizontal lever or brake at each side, united by cross arms to an oscillating central shaft supported in bearings. The engine therefore was a large double force pump, by which a continuous stream of water was forced through the hose upon a fire by a row of men at each side working the brakes up and down as most of our readers have no doubt seen. Engines of this character, and of various capacities, are still made and used; but in cities and large towns, they are being rapidly superseded by steam fire-engines, in the construction of which some of our mechanical engineers have already obtained a world-wide celebrity. The annexed engraving represents the one which has been recently built for Messrs. Winans, Harrison & Winans, of St. Petersburg, Russia, by Messrs. Ettenger & Edmond, of Richmond, Va., and wherever it goes it will carry with it credit to the builders and to our country. The workmanship of it appears to be first-class as regards strength, beauty of finish, and efficiency. The boiler is a vertical-tubular, with an extensive heating surface, so as to generate steam rapidly. The entire machinery is secured on a strong four-wheeled spring truck; and the whole arrangement embraces great simplicity and compactness. Pressure and water gages, and every other device necessary to secure safety, convenience and efficiency, have been provided.



ETTENGER & EDMOND'S STEAM FIRE-ENGINE.

This engine was built from designs made by Mr. Alexander McCausland, and has proved itself equal in every respect if not superior to any engine of its dimensions heretofore built. The boiler, while running at an ordinary rate, is about twenty horse power; it is easily managed, and has the advantage of working very dry steam, not raising its water as most engines of the same class do. There is one 9-inch steam cylinder, with the steam chest beneath, and the valve is so arranged that, in case of any water working over from the boiler, it will work its own way out without having to open the cylinder cocks. The valve is worked by an eccentric on the fly-wheel shaft, in connection with a rock-arm, as on ordinary engines. The stroke of the engine is 15 inches. The pumps are of gun-metal, and set one above the other, and are reciprocating in their action, the cross-head of the engine being made in such a way that the piston rod from the steam cylinder is fastened in the center; the two pump pistons take hold, one above the other, below the steam piston, while the side or connecting rods take hold of the ends which project over the sides of the frame, and give motion to the fly-wheels. One of the pumps—the lower one—is cast solid in the vacuum chamber, so that, no matter how much the engine is jolted over the streets, the vacuum chamber will never leak. This arrangement of pump gives a chance for the valves (suction valves) to be placed between the pumps, so that the instant the engine changes its direction the water is taken off the valves, leaving them free to act without any dead water on them. A patent has been applied for, to secure this pump to the inventor of the arrangement. The pump valves are ordinary clack valves, and so arranged that one valve will fit in the place of another as well as it does in its own. The two pumps are each 3½ inches in diameter, same stroke as the engine, and are equal in area to a 5-inch diameter pump. The engine is placed low down on straight axles, and cannot turn over, no matter how fast it may be going while turning corners; the body of the engine rests on six *semi-elliptic springs*, and rides very easy. It weighs (all complete with wood and water) 6,500 lbs. The back wheels are 4 feet 9 inches high, and the front ones 4 feet 6 inches, and it is easily managed with two horses. The engine is furnished with a lamp; also, with a horse and a man-tongue. The boiler is handsomely jacketed with Russia iron, with heavy brass bands; a fly-wheel is on each side of the air chamber, which is tall and handsomely shaped. This engine, altogether, was thought to be equal in looks to any yet made, and the Chief-engineer of the Philadelphia Fire Department, in speaking of it, makes use of the following language:—"I consider it, on account of its size, *one of the best I have ever seen perform*; having thrown water 250 feet, which distance was measured in my presence by George Eckfield, engineer of the United States Mint." At a trial in Richmond, this engine was drawn up to a fire-plug on Main-street, and the fire lighted; in 10 minutes, an abundance of steam to start was made. The steam was then turned on, and a 1-inch stream was thrown high above the eagle on the American Hotel, and then along Main-street, a distance of 240 feet. It was then taken to the canal, and, while raising its own water, threw a 1⅛-inch stream 220 feet, a 1½-inch stream 143 feet, and two ⅞-inch streams 183 feet each. This trial was made when everything was perfectly new, and the boiler foaming from the grease or oil used in making it. It was pronounced by the Chief-engineer of the Richmond Fire Department worth the whole department put together at a fire. At a subsequent trial in Philadelphia, it threw the 1⅛-inch stream 250 feet, which distance the builders and those present at the trial think cannot be beaten by any 5-inch diameter pump made; and the builders are willing to put their engine alongside of any other of the same capacity for a trial at any time. Steam is guaranteed in *eight minutes*, and the boiler to maintain any pressure required for hours at a time; in fact to blow-off at 100 lbs. pressure all the time.

It is somewhat surprising that the power of steam was not applied at an earlier date to operate fire-engines in our large cities, as it is only a very few years since the first successful one was built and put into practical use. To the city of Cincinnati does the credit of first introducing the steam fire-engine belong. But if our mechanics have been tardy in applying, and some of our cities rather conservative in adopting steam fire-engines, a spirit is now abroad to redeem our credit, and make amends for past neglects. In Cincinnati, where they were first adopted, no other fire-extinguishers are employed; and St. Louis, Chicago, Philadelphia, Baltimore and New York, are each furnished with several, and the time is not far distant when they will be used exclusively. Sinews of iron and steel *never tire*, and if the boiler is furnished with food and water, and the joints lubricated with oil, the fire-horse will obey the behests of his masters and spurt copious streams by day and night, and scream defiance at weariness and sleep. It is much to the credit of Messrs. Ettenger & Edmond, and it affords evidence of their abilities and facilities in building engines, that this one was completed in 70 days from the date when the first line of it was drawn.

OUR SPECIAL CORRESPONDENCE.

The Corn-fields of Kentucky—Straight Rows at the South, Crooked Rows at the North—Cotton' Plantations—Plowing by Women—The Children of the Tropics—"Uncle Tom" and "Yellow Jack"—Novel Agricultural Implements—Southern Manufactures—A Great Invention Wanted.

MESSRS. EDITORS:—At half-past twelve at night, we were called from our rest, and entering the cars by starlight, at one o'clock on Monday morning, May 28th, we were soon whirled away from the banks of the Mississippi among the long straight rows of corn-fields of Kentucky. It is a curious fact that the Yankees, with all their ingenuity, have never learned to plow a straight furrow, while every negro in the South will lay-off a field, however large, without having a bend of a foot in a single row. The furrows are not only straight but parallel, the last one in a field a quarter of a mile square always coming out parallel with the fence. A Virginia farmer, sixty years of age, told me that he never had a short row in one of his corn-fields, in his life. In the new States, whenever you see crooked rows you may know you are among people from New York, New England and Ohio, and whenever the rows are straight, you will find that it is a settlement of Southerners. This accuracy is owing to the method of laying-off the ground. If it is desired to have the rows 3½ feet apart, two stakes are cut, each 7 feet long, one for each edge of the field. One of these is set perpendicularly, 7 feet from the end of the field, and the plowman, proceeding to the opposite edge, makes a mark there also, 7 feet from the end, and runs his furrow straight to the standing stake, operating in a direction to keep the unfurrowed portion of the field at his right hand. Returning, he splits the 7-feet strip with a furrow, thus hawing round—or, as the Southerners say, "turning haw"—at both edges of the field. The failure of Northerners to learn this simple art is mainly owing to the inveterate conservatism characteristic of farmers—their fondness for walking in the paths of their fathers—but it is also partly to be attributed to their mode of guiding their horses. I think that for driving a team attached to a wagon, the two or four reins used at the North are far preferable to the plan of riding the near-wheel horse and guiding the team by a single line on the near leader, which is in universal use at the South. But, for plowing, the single line is decidedly better than anything else that I have ever seen.

In Tennessee I saw, for the first time in my life, long rows of a broad-leafed plant, just peeping above the ground, looking something like beans. The cotton seed is planted in drills, on ridges about 3½ feet apart, generally as soon as the ground is dry enough in the Spring; and after it comes up, it is cultivated sufficiently to keep the field clean from weeds, requiring two or three plowings and sometimes two or three hoeings besides—depending on the dryness of the season. The first operationis the "scraping;" this consists in scraping the earth away from the rows of young plants by means of an implement resembling the plow, in which the share and the moldboard are replaced by a vertical plate of iron set at an angle with the beam, with the forward upright edge bent in a curve. The plants are then thinned by hand and hoed, if need be, when the ground is turned back towards the rows by means of a plow. Steel plows seem to be in general use, manufactured either at Louisville or St. Louis. The steel plow has been one of the most valuable inventions, perhaps the most valuable for all the clayey valley of the Mississippi, that has ever been made. This adhesive soil will stick to either cast iron or wood, but steel, of the proper curve and finely polished, will slip through it, requiring half the power and making far better work than the iron moldboard.

In Tennessee we saw the first slaves at work, in gangs of from two or three up to twenty. Men and women were both plowing and hoeing together, all dressed in coarse, white cotton, or that which was once white. Their movements were decidedly sluggish. There is no doubt that the negro is adapted to a hot climate. I have been told (and the assertion has been repeated to me during this ride) that sometimes, in the middle of August, when the negroes stop at noon, instead of going into the shade, they build a fire right in the open field, in order to enjoy its heat in addition to that of the sun! The negro is a child of the tropics. He is also admirably adapted to malarious regions. It is a mooted point whether negroes *ever* have the yellow fever.

The railroad from Columbus, Ky., just below the mouth of the Ohio, to New Orleans is a very good one and well furnished; the rolling stock is in admirable order. The names of the several manufacturers on our train of cars indicated not only the broad and liberal spirit in which the patronage of the road has been distributed, but also the great extent to which machine and other shops have been established in the country. The locomotive was made at Paterson, N. J.; the tender, at Wilmington, Del.; the passenger cars, at Dayton, Ohio; part of the freight cars, at Augusta, Ga.; and the others, at Charleston, S. C. All the work seemed to be good, and I noticed that the passenger cars, especially, were very thoroughly built, no rattle whatever being produced, but all parts fitting snugly.

But, oh, the dust! It is a very dry time and the clay of this valley, beaten to a very fine powder, is raised in darkening clouds by the lightest breeze, and smothers the unfortunate traveler who rides through it from morning to night. If Mr. Ruttan or any other person has got a plan for ventilating cars and keeping them free from dust, why do not our railroads adopt it? And if he has not, why do not some of our inventors produce one? It would be the greatest benefaction that has been bestowed upon travelers since the invention of the locomotive itself. If no one does it before I get back, I think I shall perform the mighty task myself! I have a plan which is a slight improvement on an invention already made, and which bears the same relation to efforts in this line that Fulton's wheel did to steam propulsion, just the last step to make the thing practicable. I will get a spirited capitalist to join me in the enterprise, take out a patent through your unequaled agency, publish, in your widely-circulated journal, an illustration by your incomparable artists, to say nothing of the transparent description that would accompany it, and having thus conferred an immeasurable blessing upon mankind and realized a great fortune for myself, I will resume my rambles about the world, writing no end of "special correspondence" to the SCIENTIFIC AMERICAN! B.

New Orleans, La., May 29, 1860.

AMERICAN NAVAL ARCHITECTURE.

[Reported expressly for the Scientific American.]

THE IRON SCREW STEAMER "SOUTH CAROLINA."

The hull and machinery of this vessel were built by Harrison Loring, Esq., of East Boston, Mass.; it ranks as a superior vessel of the first class, both in respect to speed and construction. The essential elements of its many parts we herewith annex:—Length on deck, from fore-part of stem to after-part of stern post, above the spar deck, 210 feet 6 inches; breadth of beam at midship section, above the main wales (molded), 34 feet; depth of hold, 17 feet; depth of hold to spar deck, 25 feet 3 inches; draft of water at load line, 13 feet 6 inches; tunnage, 1,155 tuns. Her hull is of wrought iron plates (angle iron), ½ to ¾ of an inch in thickness, and very securely fastened with rivets ½ and ¾ of an inch in diameter, every 2⅛, 2¼ and 2¾ inches. Distance of frames apart, at centers, 18 inches. There are 5 keelsons, each 17 inches deep, and shaped I. The floors are shaped Z L; depthl (molded), 4½ inches, and are 3 inches in thickness; the same are connected athwartships, 17 inches in depth, and sided 7-10ths and ½ inch. The shape of her keel is I, 9 inches deep and 3 inches in thickness.

The *South Carolina* is fitted with one vertical, direct, condensing engine; diameter of cylinder, 62 inches; length of stroke of piston, 44 inches; material of propeller) cast iron.

She is also supplied with one horizontal, tubular boiler; built in 1860, and located in hold, forward of mainmast; it has water bottom and no blower to furnaces. It has also one smoke pipe and one slip joint to smoke pipe. Bunkers are of iron; water-ways are constructed of white pine, 24 by 14 inches.

The protection against communicating fire from boiler to surrounding woodwork is ample, being of felt, zinc, sheet iron, &c. In addition to these features, it is supplied with one independent steam, fire and bilge pump, bilge injections, side and bottom, and has valves or cocks to all openings in her bottom.

It possesses four water-tight, athwartship bulkheads, and two cargo or loading ports on main deck.

The owners of this vessel are the Boston and Southern Steamship Company, and the particular points of her intended service are Boston, Mass., and Charleston, S. C.

U. S. STEAM SLOOP-OF-WAR "SEMINOLE."

As the recent trial trips of this vessel of war have proved extremely satisfactory, and as she is claimed to be a very superior boat in every respect, we deem it advisable to lay before the readers of the SCIENTIFIC AMERICAN, the particulars of her construction; they will be found subjoined:—Length on deck, from fore-part of stem to after-part of stern post, above the spar deck, 210 feet; length at load line, 200 feet: breadth of beam at midship section, above the main wales (molded), 28 feet; depth of hold, 12 feet; extent of engine and boiler space, 38 feet; draft of water at load line, 14 feet 6 inches; displacement at this draft, 937 tuns; tunnage, 800 tuns. Her hull is of white oak, &c., and securely fastened with spikes, treenails, &c., of the requisite diameter, in the best possible manner.

The *Seminole* is fitted with two condensing, back-action propeller engines; diameter of cylinders, 50 inches; length of stroke of piston, 30 inches; diameter of screw 9 feet 6 inches; length at hub, 2 feet; expanding pitch of same,, 17 and 18 feet; length at periphery, 1 foot 9 inches; number of blades, 2.

She is also supplied with two of Martin's vertical tubular boilers, whose length are 22 feet; breadth of same, 10 feet 6 inches; hight, exclusive of steam chimney, 10 feet 3 inches; hight, inclusive of steam chimney, 14 feet 6 inches; number of furnaces in boilers, 12; their breadth, 3 feet; length of grate bars, 5 feet 6 inches; number of tubes in both boilers, 3,685; internal diameter of the same, 2 inches; length of these, 3 feet 1¼ inch; diameter of smoke pipe, 7 feet 6 inches; hight above grates, 50 feet. Maximum pressure of steam, 50 pounds; maximum revolutions at above pressure, 80; point of cutting off by link motion, variable; weight of boilers with water, 300 tuns.

She has one Pirsson's surface condenser; also one air-pump; diameter of cylinder, 26 inches; length of stroke of piston, 30 inches; she has, also, one fresh water pump; diameter of cylinder, 13 inches; length of stroke of piston, 30 inches; the condenser, air and fresh-water pumps being common to both engines. In addition to these features, she has one auxiliary boiler (Martin's) for donkey pump, two masts; all the blow-out cocks, &c., essentially necessary in a sloop-of-war of the first class.

The hull of this vessel was built by the United States government; her machinery was designed by Mr. T. F. Rowland, and constructed by the Morgan Iron Works, of this city.

It is certainly very evident that future wars on the seas are to be carried on mainly with vessels of war of this class and tunnage. Small craft, drawing but little water, and being able, by steam to defy wind and tide, are infinitely superior for the practical purposes of warfare, than immense line-of-battle ships and monstrous frigates. Some of the foreign powers are building gun-boats drawing 5 to 9 feet of water, and each carrying one gun of the largest caliber. They have proved, on various occasions, to be of much service and great advantage. It is well that this country follows, to some extent, their example, and continues to erect such vessels as the *Seminole*, *Brooklyn*, *Pocahontas*, *Iroquois* and others, rather than those of the expensive and larger class, such as the *Niagara*, *Susquehanna*, &c.

LOWERING HUGE WATER PIPES.—In the Eighth-avenue, this city, a huge main pipe for conveying the Croton water is being lowered to suit the change of grading in the street. This is being executed in an ingenious manner while the water is flowing through. In some places the pipe is lowered about 14 feet, in others only a few feet, all to suit the grade. The section of pipe which is exposed and operated upon at one time is about half a mile in length, which affords a long and easy incline in lowering. To provide against accidents from the pipe becoming loose and separating during the operation, and the water thereby permitted to flow out, iron flood gates has been put on at each end, so that the water can be shut off suddenly if required. The pipe is supported on blocks, while the earth is being excavated to the allotted depth around it, after which it is lowered to its seat by screws while the blocks are being removed. The operations are conducted with great care and practical skill.

THE CORRELATION AND HOMOGENESIS OF PHYSICAL FORCES.

The following article, written by L'Abbé Moigno, was recently published in the London *Photographic News*:—

All the forces of nature—motion, heat, light, electricity, magnetism, chemical affinity—have intimate relations, or correlations with each other. These forces engender each other; so that, one being given, we can by putting it into action, produce all the others. This generation or homogenesis of the various forces by each other takes place in definite proportions, or according to the law of fixed equivalents; so that the quantity of any one of these forces expended in the act of generating another force is always represented by a corresponding quantity of the force engendered. Thus, for example, if, to create a mechanical force, we expend, without loss, the quantity of heat necessary to raise a kilogramme of water one degree of heat, the mechanical force produced will be capable of raising, in a second of time, 427 kilogrammes to the hight of a meter; and reciprocally, if, to produce one degree of heat, we expend the force capable of raising a meter in hight, in one second, a weight of 427 kilogrammes, the quantity of heat engendered will be that necessary to communicate, and will suffice to communicate to a liter of water one degree of temperature. M. de Beaumont's machine admirably demonstrates this fundamental principle, which will receive its full development when science shall have become able to define and accurately determine the mechanical, thermal, photogenic, electric, magnetic, and synergic equivalents, as clearly and accurately as it has arrived at determining the chemical equivalents of various simple and compound substances.

But this is not all. In making another step in advance, we have established, as a certain proposition, that the generation or homogenesis of the various forces nature is accomplished by areal transformation of one into another; so that, for example, heat, under given conditions, is transformed into a motive power, into light electricity, magnetism, and chemical affinity; or rather, becomes motive power, light electricity, magnetism, and chemical affinity. The beautiful experiment of Faraday, completed and fully developed by Foucault, of a cube submitted to rapid motion becoming hot when this motion suddenly stopped, is the sufficient and certain demonstration of the transformation of the quantity of motion into the quantity of heat—a transformation regulated by the principle of equivalents. At length we arrive at the theory or metaphysical reason of these intimate relations of the homogenesis, of these mutual generations or transmissions, always obeying the laws of equivalents. Our profound conviction is, that Mr. Grove and M. Seguin are perfectly correct when they assert that in nature there are only two things, matter and motion; matter under two forms and submitted to the law of universal attraction; motion once impressed on matter, which cannot augment either in its quantity or in the sum of its active forces, which may be successively transformed and modified.

When a ray of light falls upon a daguerreotype plate, forming part of a galvanic circuit which includes a galvanometer and Breguet's metallic thermometer, there is instantaneously and simultaneously produced chemical affinity on the surface of the plate, an electric current in the galvanometer, an elevataion of temperature in the thermometer, motion in the two needles of the galvanometer and thermometer, &c. As a concrete and striking example of homogenesis, we may instance what we will term the human machine, that masterpiece of creative power. It is sustained solely, first by alimentary provision, composed of carbon, hydrogen, nitrogen, and assimilative mineral principles, then by atmospheric air introduced by respiration. The vital phenomenon, *par excellence*, is the combustion of carbon and hydrogen by the oxygen of the atmosphere—a combustion which, it appears to us, is summed up in a first disengagement, in a first motion, in a first circulation of μ. Now, observe to what this first motion gives birth: a very intense heat, which maintains our whole body, even in winter, at a temperature of 98° Fah., an electric or nervous current, of which M. Helmholtz has established the existence and measured the velocity; the circulation of the blood in the entire system of arteries and veins; a mechanical force sufficient to transport the entire body which, upon an average, weighs 160 lbs., with a velocity of several yards per second; the muscular force exercised by the various organs which make of an active man one of the strongest animals in creation; chemical affinity under a thousand diffierent forms, with the very complex series of. combinations and decompositions, assimilations and secretions, &c.; evidently, this is not only the correlation of physical forces, it is also their homogenesis, their mutual transformation, their identity in cause and also in nature, &c.

RENDERING TEXTILE FABRICS FIREPROOF.

The large number of casualties which are caused by the very combustible nature of the dresses of ladies, and other wearing apparel, has called the attention of eminent philosophers to provide a cheap and effective preventive against the same, and one of them—Mr. Doebereiner—publishes his ideas on this subject in a long treatise. After having given his advice, in cases of clothes taking fire, to avoid violent emotions, to lay down and to cover oneself up with quilts or anything of this kind that may be on hand, then he describes preventives. Substances have lately come into common use for wood and building materials, but for textile fabrics—which are generally made of flax or cotton—nothing has as yet been proposed which has been used to any extent to render them fireproof.

The principal preventives against the combustibility of textile fabrics, which have been proposed, are borax, alum, soluble glass and phosphate of ammonia. The three first named materials are equally good for coarse, combustible bodies, but they are not fit for the fine woven or knitted fabric. Borax, when it dries, puffs up under the action of the hot smoothing-iron, and it not only renders the fabric hard, but it also comes off in the form of dust. The same thing takes place with alum, which furthermore is liable to render fine textile fabrics brittle, so that they tear when subjected to a slight torsion. Soluble glass renders the fabric hard and brittle, and it acts to a certain extent on the fibers themselves, weakening the same, and causing the fiber to tear very easy.

Nothing of this kind takes place with the phosphate of ammonia. It leaves the fabric, after the same has been dried in the open air or by the hot smoothing-iron, sufficiently soft and pliable with the least effect on the fiber, and it may even be mixed with the paste used for starching. One ounce of this salt is dissolved in one quart of water, and the solution is applied to the fabric either by itself or mixed with the starch, and the fabric is afterwards dried in the open air or by the application of a hot smoothing-iron.

Careful housewives may make an experiment by saturating a worthless piece of linen or cotton cloth with phosphate of ammonia, and they will find that said cloth, on being held over the flame of a lamp or candle, will char after a certain time, but it will not burn except on some places, and then only after several minutes. If dresses, shirts and other articles of linen, cotton or paper, would be commonly treated with phosphate of lime, the danger arising from the catching fire of wearing apparel, bedclothes, &c., would be greatly lessened.

The principal difficulty thus far has been the high price of the phosphate of ammonia, and we will therefore point out several methods by which this salt can be produced in large quantities and at a comparatively small expense. It can be produced nearly pure by treating five parts of pulverized burned bones with three parts of sulphuric acid and twenty parts of water, and adding pure carbonate of ammonia, or it can also be produced from the liquid obtained in the manufacture of glue from bones by treating with muriatic acid. This liquid is neutralised by adding carbonate of ammonia, and after separating the precipitate from the liquid the latter is crystallized by evaporation. The mixture thus obtained of phosphate of ammonia and sal ammonia can be separated by repeated crystallization; but this operation can be dispensed with, as sal ammonia does not interfere with the effect of the phosphate of ammonia, and, to a certain extent, it enhances the quality of making the textile fabrics fireproof.

One ounce of this mixture can be produced for two cents, and when mixed with one quart of water, it will be sufficient for a large quantity of clothes.

[The above is translated from the Breslau (German) *Gewerbeblatt*, expressly for our columns, and the information should be extended far and wide. There is much scientific and practical information that is exceedingly useful, but is only applicable to certain trades and professions; but this is valuable knowledge for every household, and every female in the country should be acquainted with it. If the phosphate of ammonia were commonly employed in all households for treating outer garments made of textile fabrics, we would seldom hear of deaths from clothes taking fire.—EDS.

OUR NATIONAL PROGRESS.

At the period of the Revolution, our population did not exceed 3,000,000, and now it is nearly 30,000,000! In 1850, our total population was 23,191,876, and we had about 1,000 miles of telegraph in operation. The census will be again taken this year, and it is expected that our population will now number about 30,000,000. In this important particular, we have excelled, by rapidity of increase, all nations, whether ancient or modern. At the Revolution, we found but 13 States; but now we have 33 States and 7 Territories. Did mankind ever before witness such magical enlargement as this?

Our commerce, in 1791, was valued at $52,000,000 imports and $19,000,000 exports. In 1858, it amounted to the enormous sum of $282,613,150 in imports, and $324,644,421 in exports (specie included). Our exports of cotton alone—a product entirely new since the Revolution — reached the unprecedented value of $131,386,561.

Our common schools now educate 4,000,000 of individuals annually.

The geographical features of our country are as follows:—

	Miles.
Mean breadth of the United States from the Atlantic to the Pacific	2,480
Length from north to south	1,840
Land frontier	4,070
Sea coast	5,430
Lake shore	1,250
Navigation of the Mississippi and its tributaries	22,000
Public lands, worth (at $1.25 per acre)	$1,250,000,000
Manufactures and mining procuce in 1850	1,013,336,463
Agricultural produce in 1850	1,600,000,000
Real and personal estate	9,000,000,000

The last three items have been largely increased since the census of 1850; and we think that one-fourth may be safely added to the totals. Our manufactures at that time employed 2,000,000 of persons, at an annual cost of $233,000,000 for labor.

SPHEROIDAL CONDITION OF BODIES.—M. Boutigny d'Evreux, the gentleman whose work on the "Spheroidal State of Bodies" has gained for him a well-deserved reputation, has just sent to the Academy of Sciences (Paris) a few words of objection to the limited manner in which this spheroidal state is viewed in many works on physics. M. Boutigny objects to the term *spheroidal state of liquids*, taken exclusively, as *solids* are likewise susceptible of taking it. Some solids, such as chloride of ammonium, bichloride of mercury, nitrate of ammonia, camphor, iodine, stearic acid, margaric acid, wax, suet, &c., pass directly to a spheroidal state without at first becoming liquid. If a piece of ice be made to take the spheroidal state, and be then thrown upon the back of the hand (in this experiment the product is partly in the spheroidal state and partly solid), one feels, at a very short interval, two very distinct sensations; first, that of a temperature of +208° (nearly that of boiling water), next, that of cold=32°. On operating upon larger quantities, and with the aid of a thermometer, these temperatures are easily determined.

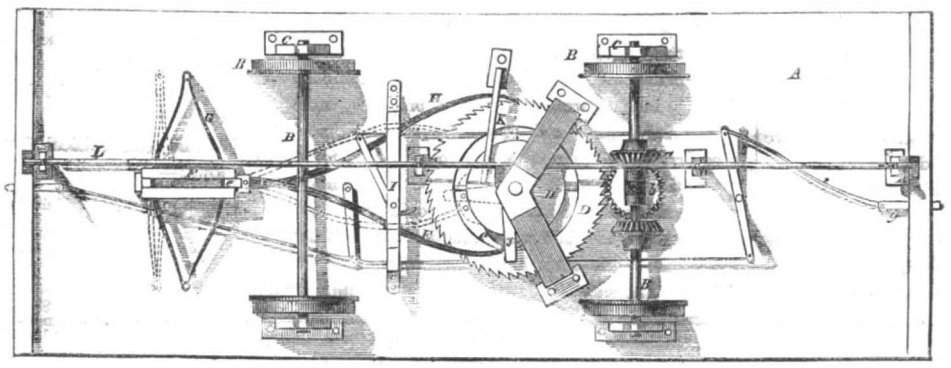
CLEANING GLASSES AND CAPSULES.—There is often a difficulty in cleaning glasses or porcelain capsules to which organic matters have adhered and in course of time become so hard and dry that they resist all solvents. The following process will be found to answer in almost every case:—The spots to be cleaned are moistened with concentrated sulphuric acid, and powdered bichromate of potash is sprinkled upon the acid; the objects are then left standing for some hours (through the night) in a moderately warm place. All organic matters are by this means destroyed, with formation of sulphate of chromium, which may be removed by water with the residue of the acid.—*Dingler's Polytechnic Journal.*

ARMSTRONG GUNS.—Very great activity prevails in all the Britith arsenals and dockyards. The gun factories are at work night and day on a prodigious scale, forging Armstrong guns of all sizes, from 6 up to 100-pounders. It is expected that twelve hundred heavy guns will be ready this year. During the past nine months, forty complete batteries of field rifle artillery have been equipped for service, besides two hundred 40-pounders for navy uses.

BRAKE FOR STREET RAIL CARS.

That increased facilities for commerce and transportation cause greater influx of traffic and travel to the principal streets of large cities is indisputably recognized, and where the consequent inconvenience of narrow thoroughfares cannot be corrected, it must be modified, by economizing time and space. Since the introduction of street railroads in some of our principal cities, in place of the antiquated stage-coach, the public have experienced great convenience in the facility of transit—the sidewalks are relieved from pedestrians and the center of the street from vehicles. Space is thus economized, because omnibuses are in a great degree abolished; while the work heretofore inadequately performed by three of those vehicles is easily accomplished by one car in half the time, notwithstanding it is concentrated and confined to one channel. The cars being quickly stopped by the application of the brake, the most refractory horses are immediately arrested.

We here present to the notice of our readers an illustration of an improved system of brakes, the object of which is to lessen, to a great extent, the labor of stopping and starting the cars on street railroads, which consists in employing the momentum of a car to wind up a spring and apply the brakes at the pleasure of the driver, and to apply the counteracting influence of the spring when wound up to the brakes in such a manner that they give the car a forward impulse when relieved, and thus overcome the extra power at present required of the horses in starting from a "dead stand." For street railroad cars these advantages will be more readily felt, as the cars are continually stopping and starting to receive and discharge passengers, and where passing vehicles are on the track.



JENKS & STEERS' BRAKE FOR STREET RAIL CARS.

The annexed cut represents the bottom of a street railroad car, with the system of brakes applied thereto, which, with a short description, will be made plain to such of our readers as are skilled in this class of inventions.

A represents the flooring of the car body, B, the wheels, C, pedestals in which are hung the axles, B', all of which parts are in common with those of the present construction for city cars.

On the forward axle are keyed two bevel gear-wheels, *a a'*, either one of which is kept in gear with a bevel gear wheel, *b*, which engages with a spur wheel (not shown in the engraving) that gives motion to a small pinion which, in its turn, actuates the large horizontal ratchet wheel, D, with a rapid motion. On the bottom of the ratchet wheel, D, is fixed a hub, D', having an annular groove in its circumference, in which groove plays the brake block, *c*, and this block is jointed to a curved arm, E, that proceeds to the rear of the car and connects by a joint to a sliding block, *e*, which plays longitudinally back and forth in a grooved box, F, and which is acted upon by an elliptic spring, G, so as to be forced forward. H is a curved pawl bar that is also jointed to the sliding block, *e*, and which is acted upon by the ratchet wheel, D, simultaneously with the movement of the arm, F. Both the bar, H, and arm, E, pass through, and are guided by the slotted hanging bracket, I.

J is a clutch arm that is capable of moving up or down on the ratchet wheel (D) shaft, but which will allow this shaft to turn in it freely until it is clutched with the ratchet wheel, D, where it then fixes the block, *c*, to the ratchet wheel and causes the block to turn with this wheel and compress the spring, G, which operation brings the wheels gradually to a stand still, and the pawl bar, H, keeps the spring, G, in this compressed state until it is relieved from the ratchet wheel, D, in starting the horses by an arrangement of levers that are connected to the draught pole, *g*, which levers merely disengage the pawl from the wheel, D, when the spring, G will throw the break block, *c*, around to its normal position.

After the brake block is applied to the hub, D', it is carried one quarter round and stopped by a wedge bar, K, which disengages the block and clutch arm, J, from the ratchet wheel; the ratchet is then capable of rotating, but still it is under the influence of the brake block, *c*.

The application of the brake block to the hub, D', is effected by a rod, L, that extends from end to end of the car, and a hand lever projecting up from the platform in a convenient position to the driver, with a vibrating yoke plate that actuates the hub of the clutch arm, J; the driver has only to move the hand lever to one side or to the other to apply the brakes.

The operation of stopping or starting the car is as follows:—The driver, when he wishes to apply the brakes, moves the lever that is attached to rod, L, which engages the brake block with the ratchet wheel, D, and causes this block to press upon the periphery of hub, D', in consequence of the action of the spring, G, the car is thus gradually stopped. In starting the horses again, they relieve the brake block suddenly, as before described, and cause the spring to act indirectly upon the car wheels, so as to propel the car forward when the movement is kept up by the horses.

This comparatively simple improvement is another beautiful illustration of the employment of mechanical instead of animal power, the patent for which was procured through the Scientific American Patent Agency, and any further information in relation to it may be obtained by addressing the inventors, R. W. Jenks, Jr., and F. A. Steers, at Providence, R. I.

SUGAR.

Until a comparatively modern epoch, sugar was neither considered a luxury nor a necessary of life. It is a question whether it was known to the ancients; but Salmarius in his exercitations upon Pliny, and Matthiolus on Dioscorides, lead us to believe that it was so, and indeed, the former assures us that the Arabs have used the art of making sugar, as we now have it, for nearly a thousand years. In the Bible, allusions are made to "the sweet cane which came from a far country;" but the cane was not cultivated, and the saccharine matter was allowed to ooze out of the cane itself, and to harden like gum. It was known as "Indian salt," and only used as medicine, for which purpose, about 800 years ago, it began to take the place of honey.

Our word sugar is derived from the Arabic *soukar*, but its Latin name is *saccharum*, now applied to all sweet-tasting fluids. The sugar-cane grows in any hot climate, and is supposed to have been brought into Europe first from the interior of Asia to Cyprus, thence to Sicily, Madeira and the Canaries. The Portuguese and Spanish navigators introduced it into the West Indies and tropical America, whence we now obtain our supplies of sugar.

There are other varieties of sugar produced by different plants. Thus, in North America a large proportion is extracted from the maple tree, and in France from the beet-root. Sugar in plants is analogous to fat in animals; as if it were the end a plant had in view by its vitality to produce and lay up in store within itself—sugar; hence, the subservience of plants to man in this case is self-evident. Nearly every flower-cup contains a minute portion of sugar, which, being gathered by bees, we are familiar with as honey, the peculiar flavor of which depends upon the blossoms it is taken from. Grapes are so full of sugar that, when dried, white crystals of it are found within the fruit, and which may be seen when resins are cut open.

Manna is a kind of sugar which exudes from certain plants (*algul*) as we see gum does from plum-trees in our gardens; but the analogy is not correct unless we understand that manna covers the whole plant leaves and branches. The Arabians have a tradition that the manna mentioned by Moses fell from the clouds upon the plant algul. It is now pretty well understood that the natural constituents of plants do change from one substance to another; as the worm becomes the chrysalis and then the moth, so will starch become sugar, and sugar turn acid at the plant's behest.

Sugar is a most excellent and useful food, and the "sweet tooth" of youth instinctively induces us to eat it at a time of life most befitting the animal economy. One quality, however, of sugar renders it most remarkable—the most important of all vegetable products to man—and that is its convertibility into alcohol or spirit. When sugar is dissolved in water in contact with certain fermenting substances, or when the sweet expressed juice of fruit is allowed to remain exposed for a few days an intestine revolution takes place spontaneously—the saccharine or sugar disappears, and in its place is found that all-potent liquid alcohol. Chemically speaking, the phenomenon of this change was the most difficult, the most inscrutable of explanation; hence the enormous research of the philosophers for a solution of the problem.

Where the laborers are many, the harvest should be fruitful; and so it has been in this instance. The researches into this elixir of life, or *aqua vitæ*, as it is termed, have been the foundation of the most sublime of sciences—chemical philosophy. As we have stated, starch is convertible into sugar, and this often takes place without our cognizance. Potatoes consist of nearly all starch; when "frosted" they become sweet, the starch turns to sugar. Nearly all seeds contain starch; and when they begin to germinate, the starch becomes sugar, fit food for the young plant till it has acquired leaves; thus barley is made to grow. In the hands of the maltster the starch in the barley becomes sugar; the conversion of this malt into liquor, whisky, &c., is then the new garb of sugar.

The following are the approximate quantities of sugars produced annually in different parts of the world:—Cane sugar, 25,000,000 cwts.; beet root sugar, 3,250,000 cwts.; palm sugar, 2,000,000 cwts.; maple sugar, 405,000 cwts.; manna and honey, 10,500 cwts.

SEPTIMUS PIESSE.

WHALE LEATHER.—Squeezing oil out of stone coal was a thing to be thought of as a miracle that might some day convert the heathen; but to get shoe leather from the skin of a whale is so reasonable a probability, that one is amazed it should not have been long ago attempted. A Frenchman has obtained a patent for whale leather, and remarkably pliant stuff it is. The skin is so thick that, after removing the inner portion, which is spongy, the remainder is split to make it of the usual shoe thickness. It is remarkably tough, but as soft as buckskin, and it repels water well. The Yankee boot is most miserable; the leather is spoiled by bad tanning and worse working-up. This makes an unfair relation between supply and consumption, which it will need all the whales of ocean to equalize. The discovery comes at a time when land leather is growing alarmingly scarce; and we behold in it a beautiful provision of Providence, only excelled by the discovery of coal oil at a juncture still more critical in the history of human progress.

TROWS' CITY DIRECTORY FOR 1860.—The seventy-fourth annual "New York City Directory," has just been published by Mr. John F. Trow; H. Wilson compiler, No. 50 Green-street. It contains over 1,000 pages, and 150,303 names—an increase of 2,978 more than the volume of last year. It is the most useful book for business men published in the city, and the present volume is in many features the best that has ever been issued.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

[Reported expressly for the Scientific American.]

On Thursday evening, June 6th, the usual weekly meeting of the Polytechnic Association was held at its room in the Cooper Institute, this city; Professor Mason presiding.

MISCELLANEOUS BUSINESS.

Brakes Operated by Steam.—Mr. A. Mortara exhibited drawings of his method of operating rail car brakes by steam. As Mr. Mortara does not speak English, the drawings were explained by Major Serrell. The working cylinder is placed on the tender or first car, and by means of suitable mechanism, the power of the piston is transmitted simultaneously to all the brakes of the train. The brakes are thus under the control of the engineer or a single brakesman. Mr. Mortara proposes the same device for operating hoisters and the wheels of ferries.

Measuring Faucet.—Mr. Whitman presented his patented measuring and registering faucet. This faucet is simply a force pump with a solid piston operated by a lever or crank. The cylinder is of the capacity of the unit of measure (pint, quart, &c.), and at each discharge an index on a dial-plate moves forward one degree. Mr. Whitman thinks this invention will supersede the use of funnels in grocery stores, abate the nuisance of flies about molasses casks, and detect frauds in the capacity of barrels. The faucet, made of cast iron and capable of measuring quarts, is sold for $4.

DISCUSSION.

The regular subject of this meeting was the report of the committee (Messrs. Bartlett, Butler and Serrell) proposing a re-organization of the club. During the discussion, the history of the origin and operation of the club was given, from which we select the most important facts.

The Polytechnic Association, under the name of the Mechanics' Club, was brought into existence March 2, 1854, by a vote of the Institute, and placed under the immediate care and supervision of the standing Committee of Science and the Arts. The organization of the club and its rules of proceeding were of the most simple character. A president and secretary—the only officers—were appointed by the committee, to hold office one year. The meetings were public, and all persons who attended them were considered members of the club, with equal privileges of speaking and voting. The Institute assumed the payment of current expenses, and provided for the publication of the proceedings. The first hour of the regular meetings was devoted to the examination of new inventions, discoveries, or communications on science or the arts, and the remainder of the evening (till 10 o'clock) was spent in the discussion of a subject previously appointed.

The first regular meeting of the club was held January 15, 1855. In the procedings, as published in the transactions of the Institute, the following names occur:—Renwick, Stillman, Mapes, Pell, Meigs, Maynard, Simpson, Everett, Serrell, Fisher, Pirrson and Stewart. Among the subjects proposed for discussion were—"Will the addition of sand in large quantities increase the amount of steam from a steam boiler, other things being in the same condition?" and "What effect will a jet of cold air have upon the effective force of a steam engine if ejected into the cylinder of the engine while in operation?"

On March 16, 1859, the name Mechanics' Club was changed to Polytechnic Association, but no change was made in the organization; indeed, up to the present time no change in the object or machinery of the club. The few simple rules first given have been adhered to from the beginning. The presidents of the club have been H. B. Renwick, S. D. Backers, C. H. Haswell, T. B. Stillman and C. Mason. Henry Meigs has held the office of secretary from the first.

The organization of the club, proposed by the committee, is substantially as follows:—

1. Any member of the American Institute may be a member of the association, but is first required to subscribe his name to the rules.

2. Persons eminent in the sciences or useful arts may become members on nomination by the club, and approved by the Committee of Science and Arts.

3. Honorary members may be made by nomination of the club and approved by the committee.

4. The chairman may invite strangers to take part temporarily in the proceedings of the club.

5. Permission must be obtained from a standing committee, appointed for such purposes, to make a communication or exhibit an invention to the general meeting.

6. The president shall divide the members into permanent sections or standing committees on the various branches of arts and sciences.

7. The association will deposit in its archives discoveries and invention presented under seal.

8. The official report of proceedings shall be open to the inspection of any concerned on the day following the meeting.

The report elicited a lively discussion, showing a considerable variety of opinion and feeling; but at the final vote all the changes proposed were approved, and a resolution was passed referring the whole subject to the Committee on Arts and Sciences for their final action.

Subject for the next meeting—"Gas and Gas-burning."

TELEGRAPH INVENTORS.

Messrs. Editors:—I noticed, on page 356, present volume of the Scientific American, an article on "Modern Telegraphy," in which there is a mistake in accrediting the invention of the "combination instrument to A. A. Lovett. The combination instrument is the result of combining (by myself) of the House and Hughes patents with two patents of my own, and other improvements for which a patent has been applied for.

G. M. Phelps.

Williamsburgh, N. Y. June 15, 1860.

Nitrate of Silver.—The photographer's art, we may fairly say, almost entirely reposes upon nitrate of silver. I am perfectly aware that photographs may be obtained with a variety of other substances; but, up to the present day, no professional photographer could prosper without the use of the salt just named. Large quantities of it are consequently employed; and it is astonishing to observe how, with us in France, the manufacture of this important salt has improved since photography has assumed the position it now holds. Not only, however, has the manufacture of nitrate of silver improved; various means of sophistication have been imagined, various salts have been introduced into the pure article, and a fraudulent mixture has been frequently sold to the unwary photographer or to the unchemical medical practitioner. The nitrate of silver used in medicine as caustic often contains copper accidentally, and is sometimes sophisticated with nitrate of lead, as M. Millet has lately shown in the *Journal de Pharmacie.* The addition of nitrate of lead has, indeed, been practised for many years past. But recently it was found more advantageous to introduce nitrate of potash into the silver salt; and, doubtless, other fraudulent mixtures, still more advantageous, will be sooner or later put into practice. Once for all, then, I will give you an easy method for detecting the adulteration of nitrate of silver, whatever be the substance fraudulently mixed with it:—Take some of the nitrate, dissolve it in distilled water, and add an excess of hydrochloric acid. The liquid should be heated to make the precipitate of chloride of silver cohere well together. Then filter off the supernatant liquid, and, taking a few drops of it upon a slip of platinum or a watch glass, evaporate to dryness. If the nitrate of silver be pure, no residue will remain after this evaporation. If a residue appear, nitrate of lead or nitrate of potash may be looked for; and even were these found to be absent, some other substance must have been added to the nitrate of silver to produce a residue in the above circumstances.—*London Photographic News.*

The Trenton Iron Company have a stock of $2,000,000. They have three smelting furnaces at Phillipsburgh, N. J., where the ore is converted into pig iron, then sent to Trenton to be puddled and rendered malleable. They employ, altogether, about 2,000 workmen in the mines and at the furnaces. The principal establishment, at Trenton, covers 3½ acres under one roof, and is said to be the largest single building in the United States. Railroad iron, beams and girders are here manufactured at the rate of 1000 tuns per month. Some of the girders are 41 feet long and 9 inches thick. Connected with these works is a wire mill, where immense quantities of wire, varying in size from a hair's breadth to half an inch in diameter, are made. Some wire from this mill, a mile of which weighed but half a pound, received a prize at the World's Fair in London.

A COLUMN OF VARIETIES.

A fine needle may be floated on the surface of a bowl of water if laid down gently upon it.

No less than 200,000 hemlock trees are cut down annually in the United States to furnish bark for tanning purposes.

The price of good coal gas in the city of London is 4s. sterling (not quite a dollar) per 1,000 cubic feet, while in this city $2 50 is charged.

When a platinum wire is heated to redness by an electric current, a peculiar odor arises, which is caused by azone. It is formed in the air around the hot wire.

A bituminous substance has lately been discovered near Cairo, on the North-western Virginia Railroad, which contains a great amount of paraffine, and yields about 160 gallons of crude oil (similar to that obtained from coal) to the tun.

Canada balsam and turpentine, in equal parts, form a good varnish for making copying-paper for transferring. It is put on with a brush and allowed to dry.

Take three pounds of tallow, one of lard, and one of fine black lead, and two ounces of india-rubber, cut in shreds; heat them together until they are completely mixed, when it makes a most excellent anti-friction grease for the axles of wagons.

June is the great month for lobster fishing. These crustacea are caught on the American coast from the St. Lawrence river to the Gulf of Mexico. They leave the deep sea and come near the shore in warm weather, where they are taken in traps, each of which has a self-acting door that permits the lobster to come in but not to walk out. About 1,200,000 are taken into Boston alone every year.

Leaf gold is cemented to glass by saliva or a weak solution of gum arabic. Letters of gold may thus be easily put on and allowed to adhere to the glass by padding them with a wad of cotton. When dry, scrape off the superfluous leaf and allow the gilt letters to remain.

The first steam-power printing press which found its way west of the Alleghany Mountains was an Adams, built in Boston for the *Cincinnati Gazette* in 1836. It is now at work printing the *Logansport* (Ind.) *Journal* at the rate of 400 impressions per hour. A Hoe's eight-cylinder press will take 14,000 impressions per hour.

By saturating writing paper in a concentrated solution of neutral chloride of zinc, then washing and drying it, the sheets contract in size, become thicker, and resemble parchment. The solution may be used either cold or hot; but in all cases, the paper must be washed in water before it is dried.

Aqua regia is composed of three parts hydro-chloric acid (muriatic) and one part of nitric acid (aquafortis). It possesses the property of dissolving the king of metals—gold. When these two acids are mixed and heated, and some tin or gold thrown in, they give off yellowish fumes, and the metal disappears like sugar in hot water.

The earliest account of mechanism, in which heat is made to perform work by means of steam, is contained in the Pneumatics of Hero, of Alexandria, who lived about 130 B. C. In that book the author describes a sort of a steam turbine wheel, as it was proposed to drive it by the reaction of the steam issuing through orifices in revolving arms.

The highest speed hitherto attained by steamers in Europe has been 17½ nautical miles per hour—about 20 statute miles. A new steamer, named the *Giraffe*, is building in Glasgow to run at the rate of 20 nautical miles per hour, and is to be the fastest boat in the Old World; but she can be beat in the New.

A turbine is a water wheel with a vertical axis capable of moving when immersed in the water of the lower level. This is Morin's definition, and he says that the name was first used in 1833 by M. Burdin, a French engineer of mines, who applied the name to a wheel of his own invention.

The *Commercial Bulletin* says the great manufacturing interests of New England never stood better than at present, and thinks some or many of the mills there will make such exhibits in June as will surprise people, and remind them of "the good old times."

A needle may be magnetized permanently by passing the north pole of a magnet from the eye to the point several times, the friction being always in the same direction. The magnet must always be lifted up when it reaches the point.

LOOM WARP REGULATOR.

The art of weaving, although one of the oldest and most universal, having come down to us through the remotest periods of antiquity, cannot be said to have arrived at a state of complete perfection, even in the present state of arts and manufactures. There has, as is well known to all manufacturers, always beeen more or less trouble in producing cloth in that state of perfection so much desired by the devotees of the spindle and loom; the chief difficulty consisting in not being able to overcome the irregular tension of the warp in weaving. All efforts hitherto made in this direction have met only with partial success, owing mainly to the imperfect theory and manner of construction of the various devices, in the first place; and secondly, to the great difference between the outside and inside diameter of the warp—in giving off as the weaving proceeds; and thirdly, to the constant jerking of the warp as the shades pass each other, and the lay beats up the filling. These render the operations of ratchet, and similar motions used for let-off motions, uncertain, and limited in their operations, and not unfrequently materially reducing the profits of a business by producing inferior goods, when the stock and expense of preparation had given promise of a better if not a perfect article.

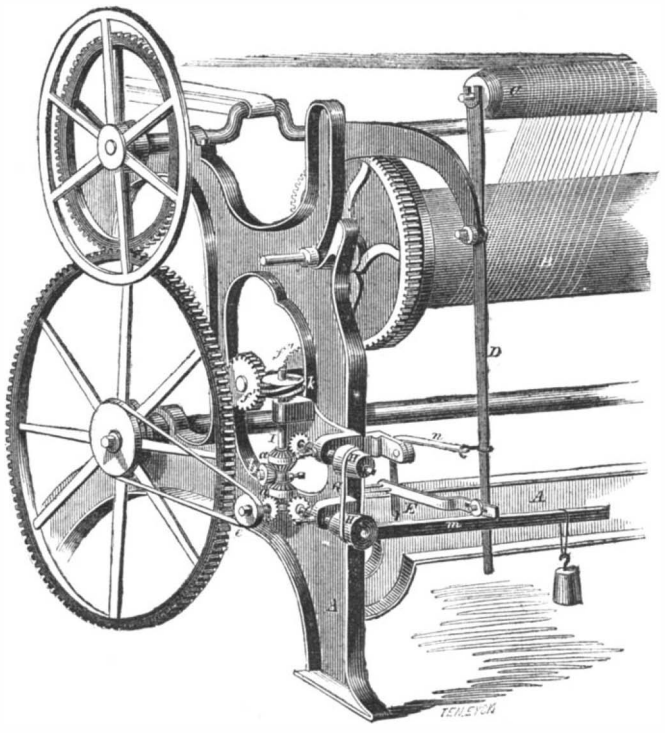
The invention which is here illustrated has been tested on various styles of goods, from the lightest silk to the heaviest woolen; and the inventor feels confident that it will fully meet the wants of manufacturers in this respect, and bring the art of weaving nearer to a state of perfection than before attained.

A A A is the frame of the loom, B B is the warp beam, and C C is the whip roll, over which the warp passes in weaving. This roll is mounted on levers, or in a swinging frame, in such a manner that, if the warp does not unwind as fast as woven into cloth, it will be pressed forward or made to yield thereto, for the purpose hereafter explained. Upon the side of the loom is a short upright shaft, I, furnished with a worm, *k*, connected to the geared head of the warp beam, B, by means of the intermediate gears, *f* 1 and *f* 2, so that, as the shaft, I, revolves, it will operate to turn the warp beam. Upon the same shaft are two double-beveled gears, *a a*, which revolve loosely thereon in opposite directions, each engaging with a small planetary gear, *b*, which revolves loosely upon the stud, *c*, which is fast to the shaft, I. It will be seen by this arrangement that, when the two gears, *a a*, revolve at the same rate of speed in contrary directions, the gear, *b*, will revolve without changing its relative position; but if the upper one revolves while the lower one is held stationary, it will roll around upon the face of the lower gear, carrying the shaft, I, with it, at a rate of speed equal to one-half that of the impelling gear. Hence, it will be seen that whenever there is a difference of speed betweeen the gears, *a a*, the shaft, I, will revolve, and always in the direction of the greatest impulse.

The manner of its operation is as follows: Motion is imparted to stud gear and pulley, *e*, in any convenient manner, as shown, driving the lower gear, *a*, in one direction, and through it and another gear and shaft the lower conical pulley, H, which, by means of the small belt, G, and upper conical pulley, H, operating through a similar shaft and gear, drives the upper gear, *a*, in a contrary direction. Now, if at the point where the belt, G, is represented as running, the gears, *a a*, are driven at an equal rate of speed, the shaft, I, will not revolve at all; but, as the process of weaving goes on, the shortening of the warp will depress the roll, C C, causing the belt guide, E, attached to an arm, D, of the supporting frame, to move the belt, G, away from that point, which will, by the varying diameters, cause a difference in the speed of gears, *a a*, and thereby produce a slow motion in shaft, I, which will unwind the warp; the rate of delivery being always regulated hy the position of roll, C C, entirely independent of the tension of the warp, said tension being obtained by means of the weighted lever, *m*, and strap, *n*, or by a spring or other equivalent device.

By a careful examination, it will be seen that this is a strong and substantial arrangement, not liable to get out of order, very sensitive, and, most of all, sure in its operation. Friction straps require constant attention, and are an everlasting source of trouble. Ratchet motions require frequent sharpening and adjusting, are limited and uncertain in their operations, liable to be deranged by a single thread of warp being caught in it; while this, being composed of gearing which cannot disengage, will cut to pieees any ordinary amount of dangling warp threads, and can only be prevented from doing duty by throwing off the belt or chocking the gears. It is simple, cheap, requires no attention (more than a drop or two of oil per day), will last as long as any other part of the loom, will save three-fourths of the trouble of managing it, is applicable to old as well as new looms, to the lightest as well as the heaviest fabric, will always keep the tension of the warp uniform from one end to the other, irrespective of the inside or outside diameter of the warp, and will, on a good loom, with even stock, produce a perfect article of cloth. As an evidence of its importance, it has been already adopted by Messrs. Cheney, Bros., of Manchester, Conn., the pioneers of silk weaving in America, who, after careful inquiry and repeated experiments with various devices, have given this their unqualified approbation. Other parties engaged in cotton and woolen manufactures in various parts of New England are testing it, and the inventor has received numerous testimonials of its satisfactory operation.

The patent for this invention was granted April 17, 1860. Applications for foreign patents have also been made. Further information may be obtained by applying to H. Conant & Co., Willimantic, Conn.



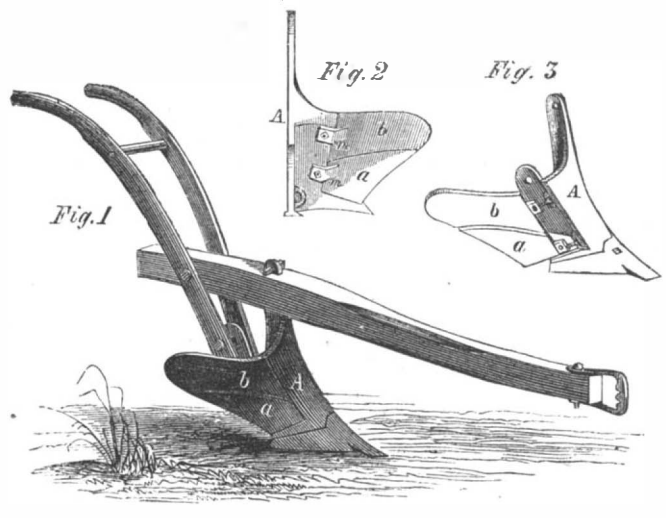
CONANT'S LOOM WARP REGULATOR.

GOOCH'S UNIVERSAL PLOW.

The plow may be truly called the first and master-implement of the farm, as the entire superstructure of practical agriculture is based upon it. The crops are entirely dependent upon the plowing operation. If this is improperly executed, owing to a defective plow, the crop will be poor in proportion; if the plowing operation is executed in the best manner possible, the crops will be in proportion, all other things being equal. Every farmer knows this; how necessary then is it, that the very best and most perfect plows—and none others—should be used! Although one of the most ancient implements, yet until within the present century, the plow was a most rude and clumsy instrument; and it is but of very recent years that our farmers and inventors have devoted much attention to its improvement. All the efforts which have been expended in this direction have been amply rewarded with success, and we present in the annexed engravingsan invention which embraces several important features. It consists of a combination plow—a quadruple implement—which, by the construction and arrangement of its different parts, forms a cultivator subsoil, half-mold-board and common turning plow. Fig. 1 is a perspective view of the complete plow; Fig. 3 is a front view showing the parts ready to be united together; and Fig. 2 is a rear end view. Similar letters indicate like parts. The beam and arms are similar to others. The part, A, is constructed with dovetails and recesses, as shown in Fig. 2 and 3, and to this the extension parts, *b a*, are united by screws. These extensions have flanges, *m m*, for the screws to pass through, and the nuts hold them firm in their places. These parts and their combinations will be readily understood.

We will now describe their offices:—By attaching the extension piece, *b*, to A, it forms a subsoil and turning plow, for as it moves in the soil, a gap of about four inches wide is left between the point and mold board, and through this a portion of the broken soil passes and is left well pulverized in the furrow, and at the same time a sufficient portion is turned over. The land is thus left well broken and level, and in good condition for receiving wheat and oat seed. It is also well adapted for plowing between rows of corn and tobacco, as the middle of the furrow is left half-full of loose earth, which will prevent washing of the soil by heavy showers. By detaching the portion, *b*, and securing the part, *a*, it forms a half-mold-board plow, which turns the bottom part of the soil, while the surface part turns over the top of the mold-board, and drops into the furrow well broken. When the parts, *a* and *b*, are secured to A, as represented in Fig. 1, it forms a complete turning plow. As a cultivator it is very superior in its operations; and with this single combination implement a farmer has a plow for performing various necessary operations on a farm without being at the expense of purchasing several entire implements. It is very simple in its construction and can readily be changed to perform any of its offices.

A patent was issued for it on the 6th of May, 1860, and more information may be obtained by letter addressed to the patentee, J. H. Gooch, Oxford, N. C.



GOOCH'S UNIVERSAL PLOW.

A correspondent of the Ohio *Cultivator* asserts that the only way to obtain a sure peach crop is by grafting upon the wild plum stock.

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

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VOL. II., No. 26.....[NEW SERIES.]....*Fifteenth Year.*

NEW YORK, SATURDAY, JUNE 23, 1860.

RETROSPECT.

THIS number completes the second volume of the New Series of the SCIENTIFIC AMERICAN; and in glancing back over its pages, we find, in the full record which they contain, abundant proof that the wonderful progress of man in his conquest over the forces and elements of nature, which marks the century in which we live, above all the centuries that have preceded it, has experienced no check during the last six months, but is moving onward with accelerated rapidity. Though no brilliant discovery in science or art has startled the world during this brief period, there is hardly a department of either art or science which has not been marked by evidence of broader development and more steady growth than during any previous period of equal length.

In science, the greatest activity is displayed by the naturalists. Not in the days of Buffon, Linnaeus, or Cuvier, nor in any earlier day, have so many powerful intellects been directed to the study of all departments of natural history as in the day that now is. And these intellects are now stimulated to unusual activity, by the earnest discussions of the origin of species excited by the publication in England of Darwin's book, and the issuing in this country of the first volumes of the incomparable work of Agassiz. One year ago the age in an intellectual view would have been designated as the age of great historians, but during this time the scythe of death has made a fearful sweep in the ranks of these illustrious men. We now never lay down a volume of Prescott, Irving, or Macaulay, without a sad feeling of personal regret that, except in re-reading their priceless productions, we are no more to derive pleasure and instruction from their profound, comprehensive, and richly-stored minds. Notwithstanding that Grote, Carlyle, Guizot and Bancroft are left, we presume the age now would be styled the age of great naturalists.

In our own more special department of the mechanics arts, our columns record a constant progress in every branch. Baudelot's Beer-cooling Apparatus, Burley's Dovetailing Machine, Holmes's Machine for Dressing Staves, Lum's Power-accumulating Windmill, Normandy's Freshwater Apparatus, Fletcher's Surface Condenser, Decker's Stave Machine, and Davidson's Boat-lowering Apparatus, and several others, would have been famous a hundred years ago, as great inventions, but they now take their places almost unnoticed among the crowd of admirable ideas which the busy brains of this generation are pouring forth in inexhaustable succession.

Besides a full description of the leading inventions in this country and Europe, with our usual variety of intelligence in science and art, and our correspondence, which is constantly becoming more extensive and valuable, this volume contains an account of three of the leading industrial interests of the country—statistics of the growth of the railroads and shipping, and a full illustrated description of the plan of telegraphing at present in use. In all three of these great interests, this country is considerably in advance of all others.

Thoroughly identified with both the intellectual and material interests of the country, the SCIENTIFIC AMERICAN has moved onward in the van of increasing intelligence, propagating useful information, stimulating invention, and advocating the rights of industry. Our retrospect is pleasant, and our experience of the past animates us with renewed zeal to labor with redoubled energy in the cause of science and the mechanic arts.

THE JAPANESE, THEIR PROFICIENCY IN MECHANICS, AGRICULTURAL SCIENCES, &C.

The advent of the Japanese Embassy, and the interest in this but partially known people, which the event has awakened in the minds of our citizens, has induced us to give some account of their acquirements in the agricultural and mechanical departments. In many things our oriental visitors may shake hands with us upon the same platform of progress; but whether we look upon them in the light of equals or from the hight of our own superior attainments as a nation yet in the middle stages of advancement, we cannot but look upon them with great interest; and nothing affords better indices of a nation's advancement than its attainments in mechanical or agricultural pursuits.

The seclusion of the Japanese has rendered them chiefly dependent upon the products of the soil for their subsistence; and being compelled to make the most of their not very extensive and rather poor soil, they have arrived at a very high state of perfection in the arts of agriculture. Though a great part of the country is hilly and mountainous, yet almost every available foot of land is cultivated and very abundant crops are raised. Where the land is unaccessible to the plow, it is cultivated by manual labor. In many places terraces are made, and these, adding the beauty of regularity and domestic cultivation to the natural scenery, renders the landscape exceedingly beautiful—a charm which none appreciate better than the Japanese themselves; for over all the islands, temples are built in positions commanding the best views, and around these temples are gardens set apart for entertainment and pleasure; and we might add not always of a character comporting with the neighborhood of the sacred edifices.

Like the Chinese, they pay great attention to manuring and to irrigation. The grain principally raised is rice, which is of a superior quality. The tea-plant is next in importance to the cultivation of rice. Sugar is obtained from the sap of a tree. The gardeners of Japan have attained to the art of dwarfing, and also of unnaturally enlarging all vegetable productions. In the gardens of their towns they exhibit full grown trees of various kinds, only three feet in hight, with heads of about the same diameter. As long ago as 1826, a box was shown to to the president of a Dutch factory at Nagasaki, 4 inches long, 1½ wide, and 6 inches in depth, in which were grown a bamboo, a fir, and a plum tree, the latter in full blossom. They sometimes stimulate the growth of their trees to such an extent that the branches stretch to a great distance from the trunk, and are supported by props.

In the manufacture of cotton fabrics, the Japanese display considerable skill; their best silk is said to be superior to that of China. They are also said to excel the Chinese in the manufacture of porcelain; like them they have long manufactured paper and glass, although not until comparatively later years have they understood the process of manufacturing flat glass for windows, and probably what they make now is of an inferior quality. They manufacture paper in great abundance as well for writing and printing as for tapestry and handkerchiefs. It is made of various qualities, and some of it is as soft and flexible as cotton cloth. Indeed that used for handkerchiefs might easily be mistaken for cotton cloth, so far as toughness and flexibility are concerned. The peculiarities of this paper we think sufficient to warrant us in giving a description of the process of its manufacture.

It is made of the bark of the mulberry (*moras papyifera*). In December after the tree has shed its leaves, they cut off its young shoots, about three feet in length, and tie them up in bundles. They are then boiled in a lye of ashes in a covered kettle, till the bark is so that half-an-inch of the wood may be seen at either end of the branch. When cool the bark is stripped off and soaked in water for three or four hours until it becomes soft, when the exterior black cuticle is scraped off with a knife. The coarse bark, which is full a year old, is then separated from the fine, which covered the younger branches, and which makes the best paper. The bark is then boiled again in clear lye, continually stirred with a stick, and fresh lye from time to time added to make up for the evaporation. It is then carefully washed at a running stream by means of a seive and incessantly stirred until it becomes a fine pulp. For the finer kinds of paper this process is repeated, a piece of linen being substituted for the seive. After being washed it is beaten with sticks of a hard wood, on a wooden table till it is brought to a pulp, which is put into water and dissolved, and dispersed like meal. This is put into a small vessel with a decoction of rice, and a species of *hibiscus* and stirred until it has attained a tolerable consistence. It is then poured into a large vessel whence it is taken out and put in the form of sheets in mats or layers of grass and straw. These sheets are laid one upon another with straw between, and pressure is applied to force the water out. After this they are spread upon boards in the sun, dried, cut and gathered into bundles for sale or use.

They excel all other people in lacquering on wood. They manufacture steel swords, unapproachable in quality, and also make from steel excellent mirrors. They are skillful in carving and die-sinking, and in the casting of metal statues. Their iron wooks, tobacco factories, breweries, distilleries, and other manufacturing establishments are frequently on a large scale, employing hundreds of men. These are mostly situated at Miako, Yeddo and Osaki. At Miako are made damasks, satins, and silk fabrics of every kind, lacquered articles, caps, scarfs, screens, fans, pins, bow strings, paints, tea boxes, grindstones, porcelain and earthenware; at Osaki, cotton goods and iron ware, and at Yeddo nearly every species of manufacture is carried on.

The short time the embassy has already been with us, shows how eager they are to profit by the experience of foreigners, and to imitate their useful arts. The inhabitants of Japan are already supplied with microscopes, telescopes, clocks, watches, knives, spoons, &c., made by themselves from European models. They manufacture Colt's revolvers and Sharp's rifles, and it is said that they have made improvements upon them. At Nagasaki works have been erected for the manufacture of steam-engines without European assistance, and a screw steamer built, which has been successfully navigated from Nagasaki to Yeddo, by native seamen and engineers.

In no portion of the world is education so thoroughly disseminated as Japan, all children—poor and rich, male and female—being obliged to attend a school.

They are proficient in medicine, astronomy and mathematics, but their superstition has prevented their dissecting human bodies, and consequently they are deficient in surgery. Among their inventions are acupuncture and moxa-burning, both of which, though now superseded by other processes, were long practiced in Europe, into which they were introduced from Japan. Their most remarkable discovery, however, is that of a powder called *dosia*, which is reputed to possess great and beneficial power in child-bearing, diseases of the eye, and for other maladies; taken in perfect health, it cheers the spirit, and refreshes the body. But its most remarkable effect is to restore a dead human body to as great a degree of flexibility as it had while living. This is done by introducing the powder into the ears, nostrils and mouth of the deceased. We have thus narrated some of the attainments in which our curious eastern visitors excel, in the hopes that they will lead us to better appreciate the importance of the events which are now transpiring in our midst. To America belongs the honor of again opening communication with this interesting people, so long shut out from the rest of the world, except the Hollanders. No one can calculate the immense good that will flow from the opening of the country of Japan to the rest of the world. We can only wait, watch, and note it down upon our journal of progress.

W. S. COLEMAN, a London publisher, has just issued a work on British insects, in which he expresses the belief that insects do not feel pain. He states that when insects are mutilated in such a manner as would cause the death of vertebrate animals, they afterwards perform all the functions of life—eating, drinking, &c.—with the evident power of enjoyment.

Two young men in Epsom, N. H., profess to have found gold upon a farm in that place, and one of them has exhibited a chunk worth over $10. Two returned Californians have visited the spot, and report that they found gold, but whether it exists in quantities that will repay digging remains to be seen.

WASHINGTON CORRESPONDENCE.

THE PATENT BILL IN THE HOUSE—PATENT REPORTS—SEEDS—CATTLE DISEASE.

On the 11th inst., Judge Niblack, of Indiana, on behalf of the Committee on Patents, reported the Senate's bill to amend the Patent laws, with some modifications, and moved to take it up. On motion of Mr. Hoard, of New York, the consideration of this bill was postponed to the second Wednesday in December next. This movement coming from Mr. Hoard, who is himself an inventor and patentee, is not well understood here, and needs some explanation. The friends of the bill may consider it effectually killed, as there is not much chance for it to become a law. The fact is, political scheming has become so much a part and parcel of modern legislation, and members have so many axes to grind of their own, that they are jealous of any measure which may take time, to the possible exclusion of their own pet projects.

Mr. Gurley, from the House Printing Committee, reported a resolution (which was passed) to print 50,000 extra copies of the mechanical part of the Patent Office report—10,000 for the use of the office, and the remainder for the members of the House.

In discussing the Appropriation bills in the Senate, the amendment appropriating $40,000 for seeds and cuttings for the Patent Office was stricken out, but afterwards restored. In the debate one of the senators stated his conviction that the agricultural bureau had abused the appropriation, paying the funds out to mere sinecures and buying seeds from New York and Pennsylvania, and distributing them in other sections at immense expense to the government, which could be bought at any store in any town in the country. Another senator pronounced the whole thing a humbug, and doubted if the Patent Office ever sent out any valuable seeds; and, upon being informed that the agricultural bureau was about to investigate the cattle disease, expressed the hope that the nation would not become a "cow-doctor." And in reference to the agricultural reports, a senator remarked that they were made of material plagiarized from books which ought to be in the library of every agriculturalist. Grave senators get a little hyperbolical at times, and allow themselves to speak lightly even of solemn topics. They are sometimes very waggish also, and bandy the joke and repartee with much good humor.

The Commissioner of Patents has appointed Dr. Thos. Antisell, who is at the head of the Chemical Department of the Patent Office, to investigate the subject of the cattle disease in New England. He is familiar, it is said, with cases of the pleuro-pneumonia in cattle, in Europe. If this is so, the doctor ought certainly to shed forth his light at once. The Patent Office is going on swimmingly, and has a large amount of business on hand. It is thought that Commissioner Thomas finds his official duties quite as onerous as he expected. CHURN.

Washington, June 16, 1860.

THE CATTLE DISTEMPER.—This terrible disease (which—under the name of *pluero-pneumonia*—broke out, a short time since, in Massachusetts, as has been previously noticed in our columns) seems to be extending its ravages, but we hope it will soon be restrained and disappear. It has visited several sections of the New England States, and has recently appeared in a locality in New Jersey, a few miles from this city. Great excitement and consternation has taken possession of the farmers in various uninfected districts. Town meetings have been held, and commitees appointed, for the purpose of excluding all strange cattle, and to demand the slaughter of all those that may be affected, whenever the first symptoms are shown as has been done by State authority in Massachusetts. It is not much to the credit of modern veterinary science in New England, that the slaughtering of infected eattle has been carried out as the only means of preventing the spread of this disease. We are of opinion that by carefully separating the infected from the healthy cattle in the same locality, and treating them upon the same principles as human beings are dealt with in cases of sickness, that the distemper would be just as effectually controlled as by the old barbarious mode of slaying the diseased. It would be a great calamity were this cattle distemper to spread throughout our country generally, but we don't believe it will. As it was produced in winter and spring by poor food and close ill-ventilated stables, it will disappear, in all likelihood, with the free air and abundant pasturage of summer.

WHAT WE PAY TO ENGLAND FOR HARDWARE.

The Treasury Department furnishes the following table of the value of goods, manufactured from iron and steel, which were imported into this country during the last fiscal year:—

Imports of Iron and Steel Manufactures.

Anvils and anchors	$64,315
Bar iron	1,185,441
Cables	174,701
Cutlery	1,761,103
Arms	314,519
Hoop iron	387,198
Muskets and rifles	16,851
Nails, spikes	84,804
Needles	254,984
Scrap iron	107,702
Pig iron	1,049,200
Railroad iron	2,274,032
Rod iron	332,801
Saws	26,495
Sheet iron	752,975
Side arms	5,716
Cast steel	1,141,871
Other steel	905,859
Wire	14,299
Manufactures of iron	2,150,625
Manufactures of steel	1,043,405
Total imports	$14,048,896

Of all this vast value there was not, we presume, a single article, nor an ounce of raw material, except steel (for which we are still dependent upon Sheffield) which could not have been furnished in this country, and not a day's labor which our own skillful mechanics might not have performed. Does it not seem incredible that more than a million should have been paid for bar iron, more than a million for pig iron, and two millions and a half for railroad iron, when the machinery for manufacturing can all be found in existence within less than a hundred and fifty miles of the port where all these things were landed? But yet we can refer with pride to the above list, as indicating—as well by what it omits as by what it expresses—the triumphs and successes of American industry. 26,495 dollars' worth of saws seems an insignificant amount of this great staple article to be imported into this country in a whole year, and yet the fact is so. But an examination of the list will show that vast varieties of "shelf hardware" are entirely left out—no *carriage bolts*, no *screws*, no *locks*, appear among the list of imports; and our readers conversant with the hardware trade know that the great bulk of the Birmingham goods which used to be imported into this country, within the last fifteen years, is now almost entirely superseded by those of domestic manufacture.—*The Iron Age.*

COVERING ZINC WITH BRASS OR COPPER.—To give zinc a coat of copper or brass for the purpose of subsequent silvering or gilding, the following solutions are used:—For copper alone, a solution of sulphate of copper, saturated at the common temperature, is mixed with a solution of cyanide of potassium, adding as much of the latter as is necessary to dissolve the precipitate thrown down at first. The hydrocyanic acid disengaged during this operation must be carried off by a draft or flue. When the mixture is clear, one-tenth or one-fifth of its volume of liquor ammonia is added, and dilluted with water to a density of 8° Beaume. For brass, blue and white vitrol are used in equal proportions, and prepared as before. Two parts of sulphate of zinc and one of sulphate of copper give a bright brass coating. Previous to their dipping, the articles of zinc are rubbed thoroughly with finely-powdered pumice-stone and rinsed with water, after which manipulation they are placed in the bath, and remain there for 24 hours. After that time they are again rinsed in water, and simply wiped off. The copper or brass coating has a very bright look, as if polished, and adheres perfectly. The thickness of the coat may be increased afterwards by the aid of a battery.—*Le Technologiste.*

TANNING SKINS WITH THE FUR ON.—Nail the fresh skins tightly and smoothly against a door, keeping the skinny side ont. Next proceed with a broad-bladed blunt knife to scrape away all loose pieces of flesh and fat; then rub in much chalk, and be not sparing of labor; when the chalk begins to powder and fall off, take the skin down, fill it with finely-ground alum, wrap it closely together, and keep it in a dry place for two or three days; at the end of that time unfold it, shake out the alum, and the work is over.

WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

MARINE DOCK.

This invention consists in combining with a suitable platform or staging, furnished with bilge and keel blockings and braces for keeping the vessel in an upright position, a suitable number of columns upon which the cradle is supported; said columns to be pointed at their ends to the cradle and to base timbers, and capable of swaying to and fro, at the same time keeping the cradle in a horizontal position, whatever be the inclination given to these columns or supports; whereby the cradle may be let down into the water under the vessel's bottom, and the vessel elevated with a forward movement, until the columns are in a vertical position, when they will serve the very important object of permanent supports, so that the vessel will not rest upon or be supported by the lifting power. The credit of this contrivance is due to H. J. Crandall, of New Bedford, Mass.

BOILERS.

This invention consists in a certain arrangement of water tubes, in twos, one within another, within the flue-box of a boiler with the lower ends of both extending below the grate, and their upper ends even, or nearly so, with the crown of the flue-box, and below the surface of the water, whereby a very rapid generation of steam is obtained, accompanied by a very free natural circulation of water to supply the place of what is converted into steam. The inventor of this improvement is M. R. Clapp, of Seneca Falls, N. Y., who has assigned his invention to Silsby, Mynderse & Co., of the same place.

HOSE PIPE.

This invention consists in making the pipe of two, three or as many more sections as may be desirable, and in attaching the sections together, when slipping into the other, in such a manner that they will be secured water tight, and so that they may be taken apart or put together and secured with great ease and freedom while the water is flowing through the hose; the invention combines in one pipe three nozzles of a different size, either one of which may be employed as necessity may require; thus the pipe-man can always have with him on his pipe a complete set of nozzles which he can regulate at pleasure. This improvement was designed by George Smith, of Macon, Ga.

TYPOGRAPHY.

J. Villet-Collignon and L. George, of Paris, France, have obtained a patent for an improvement in typography, which consists in the formation of types of two or more letters by the soldering together of two or more types of single letters. The advantage of this construction of the combined types over the casting of the letters together is supposed to consist in the fact that if one letter becomes damaged it may be taken away, and the remaining letters are useful; while when the letters are cast together, if one becomes injured the others are useless except as old metal. The inventors use a solder or metallic cement which does not require the use of heat

NEW CEMENT.—Professor Edmund Davy, lately read a paper to the Royal Dublin Society, on a cement which he obtains by melting together in an iron vessel, two parts (by weight) of common pitch, with one part of gutta-percha. It forms a homogeneous fluid, which is much more manageable for many useful purposes than gutta-percha alone, and which, after being poured into cold water, may be easily wiped dry, and kept for use. The cement adheres with the greatest tenacity to wood, stone, glass, porcelain, ivory, leather, parchment, paper, hair, feathers, silk, woolen, cotton, &c.

THE CUBAN MESSENGER.— We have received a copy of a weekly newsaper published in the English language at Havana, Cuba. Scott, Ackley & Co., No. 53 William-street, this city, are its agents.

C. F. HALL of Cincinnati, has started with his party, to search for the living or dead remains of Sir John Franklin's expedition to the North Pole, in the whaling bark *George Henry*, and the schooner *Amareth*, from New London.

The fourth "National Exhibition of Horses" will take place at Springfield, Mass., on Sept. 4th, and continue four days.

Patent Claims

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 12, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN New York.

28,642.—T. J. Alexander, of Westerville, Ohio, for an Improvement in Mechanism for Starting Sewing Machines:

I claim, first, So constructing and hanging or arranging the lever or its equivalent, which serves for the knee or knees of the operator, to set in motion mechanism for starting the treadle-driven shaft in a forward or given direction, as that said lever requires the lateral action of the knee or knees to actuate it, essentially as set forth.

Second, The employment, in combination with a treadle, and for starting the treadle-driven shaft, in a forward or given direction, of a friction pad or wheel set in motion against a band or other wheel, connected with said shaft, and actuating the same substantially in the manner described.

Third, So hanging and operating the friction pad or wheel which is employed to start the treadle-driven shaft in a forward or given direction, as that the same movement on part of the operator, which serves to rotate or communicate driving motion to the friction pad or wheel, firstly brings said friction pad in close rubbing contact with the wheel it operates, and whereby the friction pad or wheel is made self-freeing, after having started the wheel or shaft, it is employed to direct the movement of, and give starting impetus to, substantially as specified.

28,643.—Wm. A. Akins and Darius Babcock, of Dryden, N. Y., for an Improvement in Machines for Cleaning Grain when fed to the Mill, and Cooling Millstones:

We claim, first, The tube, Q, arms, c, and inclines, a, in combination with the hopper, X, and the upper surface of the revolving cone N, and the pin, P, when used for feeding grain from a hopper, as described.

Second, We claim the cone, N, and tube, R, in combination with the fan, L, when the fan L, surrounds the cone, N, and tube, R, the cone distributing the grain radially from its upper surfaces, its curved sides guiding the blast of air so as to most effectually dislodge all impurities.

Third, We claim the air passage between the upper surface of the stone, B, and the curb, U, formed by closing the opening, X X, and inserting the holes, V V, for the admission of air at the outer edge and upper surface of stone, B, for the combined purpose of cooling the stone in its passage over it, from its periphery to its center or eye, and supplying the fan with air to clean the grain.

Fourth, We claim the manner of reversing the wings of the fan, L, by hanging them upon the pin, O, so that they may be swung around to the position shown by the red lines, No. 2, and latched over the pins, P3.

Fifth, We claim running the fan, L, directly from the bail, E (or from the driver, D, which would be equivalent thereto), at the same speed of the stone, thereby avoiding the use of gear, band or belt.

28,644.—N. S. Bean, of Manchester, N. H., for an Improvement in Pumps:

I claim the concentric arrangement and combination of the pump cylinder, suction and discharge passage, caps, and valve plates, with valves located in opposite sides thereof, all operating substantially as described.

28,645.—G. H. Beard, of Cincinnati, Ohio, for an Improved Claw Bar:

I claim the instrument for drawing spikes and similar purposes, constructed as described, comprising the three following and several features, viz., the U-shaped space, E, receding towards the heel to allow the necessary traverse to the spike in the process of drawing the heel, C, and the recess formed by the inclined surfaces a a, to receive the head of the spike, all substantially as described.

28,646.—N. W. Brewer, of Williamsport, Pa., for an Improvement in Self-loading Fire-arms:

I claim, first, The arrangement of the cylinder, A, with the spiral plate, S, and cap, L.

Second, The cup-box, T, and manner of capping described.

28,647.—John Butler, of Brooklyn, N. Y., for an Improvement in Flexible Gas Tubes:

I claim, as an improved article of manufacture, a flexible gas conductor, composed of a flexible leaden tube covered with braid or other suitable pliable non-metallic covering, substantially as shown and described.

This invention consists in the employment of a tube or lead pipe possessing the desired flexibility or pliability, and which at the same time will keep perfectly air-tight; and in covering this pipe with any suitable material, either braiding or the ordinary india-rubber tubing, which shall be of a suitable thickness to prevent any liability of the lead pipe collapsing, either by weights which may be put upon it, or by coiling it up, or bending it in short curves for establishing the stand upon the table, or from becoming injured in any way from usage.

28,648.—Hugh Campbell, of Newtown, Conn., for an Improved Steam Stuffing-box for Revolving Rolls:

I claim the arrangement of pipe, n, within pipe, d, as described, in combination with the stuffing box, b, and its appendages, and roll, a, for the purposes and operating substantially in the manner fully set forth.

28,649.—C. D. Chism, of Albany, N. Y., for an Improvement in Shingle Machines:

I claim the crossbar, I, as attached to the rack feed bar, J, in connection with the recess or chamber, N, in the oscillating feed head, G, all in the manner and for the purpose specified; and these parts or means I only claim when they are connected with the adjustable lever feed bar, with the lateral adjustable screw, W, and feed pawl attached to handle, U, regulated by the spiral spring, as represented, all for the purpose and in the manner specified.

28,650.—Francis Cist, Wm. K. Kossak, and Wm. H. Godfrey, of St. Louis, Mo., for an Improved Tool for Laying and Stretching Carpets:

We claim the combined arrangement of the wedge, W, the recess, R, behind the wedge, and the slit, S, in the wedge, with each other and with the pliers or nippers, all constructed and operating substantially in the manner and for the purpose described.

28,651.—James Clark, of Newark, N. J., for an Improvement in the Manufacture of Prussian Blue:

I claim supplying atmospheric oxygen by artificial means in manufacturing Prussian blue, in the manner and for the purposes specified.

28,652.—Joseph Clarke, of Syracuse, N. Y., for an Improvement in Vapor Lamps:

I claim the construction of the conducting tubes, H and G, in one solid piece of metal, E, substantially in the manner and for the purpose stated.

28,653.—Wm. A. Clark, of Bethany, Conn., for an Improved Tenoning Auger:

I claim an adjustable hollow auger having the longitudinal lines of the periphery of the inner surfaces of the barrel at all times parallel to each other, within the entire limit of the adjustability of the instrument, constructed substantially as described.

28,654.—M. C. Cogswell and John McKiernan, of Buffalo, N. Y., for an Improved Bolting Chest:

We claim, first, The hollow shaft, A, for the purposes and substantially as described.

Second, We claim the perforated cylinder, D, in combination with the hollow shaft, A, for the purposes and substantially as set forth.

Third, We claim the combination and arrangement of the rotating reel head, S, with the stationary head-board, Q, and stationary cylinder, R, for the purposes and substantially as set forth.

Fourth, We claim the relative arrangement of the cant boards, G, cylinder, H, brush, I, bridge, K, and openings, T T, for the purposes as set forth.

28,655.—Leonard Coleman, of New Orleans, La., for an Improvement in Mills:

I claim the metal frame, A, and hoop, B, of the mill in one piece, constructed as described and in combination with the parts above claimed, I claim the feed-pipe, R, supporting the hopper, and adjusted by a screw, substantially as described.

28,656.—T. M. Coleman, of Philadelphia, Pa,, for an Improvement in Horse-shoes:

I claim the horse-shoe composed of the two plates, A and B, permanently secured together with an intervening strip, c, of gum elastic or other equivalent material, when the latter as well as the plate, B, has recesses or slots, b, arranged in respect to the nail holes of the plate, A, in the manner set forth, so that the entire shoe can be secured rigidly to the hoof by simply driving the nails and without separating the plates.

28,657.—J. S. Colvin, of Pittsburgh, Pa., for an Improved Steam Boiler:

I claim, first, The combination and arrangement before described of the small air-tight furnace, supplied with a blast of air, with a heating cylinder inside of a steam boiler in the manner substantially as before described, for the purpose of securing the more uniform distribution of the heat of the furnace than is practicable when the bottom of the boiler is exposed to the direct action of the fire, so that the greatest degree of heat shall be applied near to the surface of the water in the boiler.

Second, Placing the escape flue for the air and products of combustion of the furnace in the position in relation to the furnace and boiler, substantially as described, so that the air and products of combustion gradually descend as they part with their heat until they find their exit at the lowest point, thus preventing the escape of the products of combustion, until they have parted with us much as practicable of their excess of caloric, and thus by economizing heat, effecting a great saving of fuel.

Third, Connecting the surface of the boiler with a heating chamber inside the boiler, by means of the confined throat of the fire-chamber, substantially as described, so that the furnace being air-tight and supplied with a blast, forces the heated air to rise directly to the top of the heating chamber, and thus apply the greatest heat near to the surface of the water, for the purpose of securing the more rapid generation of steam.

28,658.—H. J. Crandall, of New Bedford, Mass., for an Improved Marine Dry Dock:

I claim combining with a cradle or carriage, D, the supporting and guiding columns, C C C, when the same are in any suitable manner jointed or hinged to the cradle, so as to allow of its being raised or depressed at the same time keeping the carriage horizontal and serving as supporting columns, when the carriage is at its highest point, essentially in the manner and upon the principles set forth.

28,659.—J. W. Crane, Jr., of Freeport, Ill., for an Improved Washing Machine:

I claim the arrangement of the hinged concave frame, C, in combination with the frame, D, the vertically-acting spring, E, adjusting connecting rod, c, pendant, H, rod, G, and the horizontally-acting spring, I, all as and for the purpose shown and described.

[This invention relates to an improvement in that class of clothes-washing machines in which a corrugated or fluted cylinder is employed in connection with an apron or concave made of rollers. The object of the invention is to give the operator complete control over the pressure to which the clothes are subjected, so that the clothes will not be unduly acted upon and injured by excessive friction, and still be sufficiently acted upon to be perfectly cleansed.]

28,660.—Wm. W. Culpepper, of Augusta, Ga., for an Improvement in Car Couplings:

I claim the peculiar form of the throat, H, combined with the sliding plate, C, spring, O, stop bolt, a, bumper rods, r, and keys, t, arranged and operating with bumper, A, and link, S, as and for the purpose set forth.

28,661.—Isaac Edge, of Jersey City, N. J., for an Improved Torch for Night Processions:

I claim a procession torch made or arranged in the manner set forth.

28,662.—Philip Estes, of Leavenworth, K. T., for an Improvement in Quartz-crushers:

I claim, first, Combining a friction lifter, m, pair of anti-friction rollers, n, tooth, S, and tongue, r, with a pestle rod, a, and a double cam, p p, in the manner and for the purposes set forth.

Second, Combining the screw-threaded end, c, of a pestle rod, a, with a ferrule screw, i', in a ratchet plate, l, in the manner and for the purposes specified.

28,663.—Samuel Frazer, of Galena, Ill., for an Improvement in the Distillation of Oil from Resin:

I claim the mode of obtaining oils from resin by distillation, as set forth, by the distillation of resin at the temperatures and in the manner set forth.

28,664.—G. E. Frew, of Brooklyn, N. Y., for a Pen and Pencil Case:

I claim the arrangement of the endless chains, D H, tubes, B C C' E F G J, pen slide, I, and pencil tube, A, substantially as and for the purpose set forth.

[The object of this invention is to obtain a pen and pencil case that may be folded within a small space and admit of being extended sufficiently to be of convenient length, when used either with the pen or pencil; also, to have the case constructed in such a way that it may be very readily manipulated.]

28,665.—A. T. Gove, of San Francisco, Cal., for an Improved Wrench:

I claim, first, In combination with the rack or racks on the shank of the movable jaw, the lever and pin or stop connected to the handle for the purpose of holding and releasing the movable jaw, substantially as described.

Second, In combination with the rack on the movable jaw, and the stop and lever on the handle, the coiled spring, s, for throwing out the movable jaw when the lever is compressed or the stop raised out of the rack, substantially as described and for the uses and purposes set forth.

28,666.—E. J. Hale, of Foxcroft, Maine, for an Improvement in Lamps:

I claim the arrangement and application of the stationary spring catch or wick-retainer, C, relatively to the lamp cap, A, and the wick tube, B, made adjustable vertically by means substantially as described.

And I also claim the combination of the rack plate, g, with the adjustable wick tube, B, and the spring catch, C—the same being for the purpose as specified.

28,667.—A. B. Hawkins and John Puntenney, of Canton, Ill., for an Improvement in Molds for Drain Plows:

We claim, as a new article of manufacture, a mole for draining machines constructed in the form and in the manner as above set forth.

28,668.—G. E. Hays, of Buffalo, N. Y., for an Improvement in Apparatuses for Vulcanizing Rubber:

I claim, first, A spring clamp constructed and operating for the purposes and substantially as described.

Second, Constructing the flask with a recess, I, for the purposes and substantially as set forth.

Third, The circular emboss, g', in combination with the corresponding depression, j3, for the purposes substantially as described.

28,669.—J. R. Henshaw, of Middletown, Conn., for an Improved Self-mousing Hook:

I claim as an improved article of manufacture, a mousing hook having a slotted bar, g, arranged to open outward, as shown, so that it cannot become entangled in the rigging when otherwise made, as represented and described.

[This invention is an improvement on the self-mousing hook patented Oct. 26, 1850, which consists in attaching to the hook a snap or spring bar, in such manner that said bar will open outwards instead of inwards, as in the aforesaid patent, and allow the hook to pass through the thimble or other object to which it is to be connected without stopped by the bar; said bar is then thrown back to its place and held there by a spring, cap and tenon, so as to be fully protected from accidental displacement and injury by the article through which the hook passes, and which is retained on the hook by such a spring bar.]

28,670.—Nehemiah Hodge, of North Adams, Mass., for an Improvement in Railroad Brakes:

I claim, first, The flexible air-chamber, D, constructed substantially as described, whereby, in combination with the air pump, I employ common atmospherical pressure as the force to operate the brake machinery and brakes of railway carriages as herein set forth.

Second, The combination of the pump, A, chamber, B, cock, C, and flexible air-chamber, C, arranged, combined and operating as and for the purpose above named.

28,671.—J. C. Huntley, of Philadelphia, Pa., for a Burglar's Alarm:

I claim the arrangement of the shaft, i, with its projection, m, and boss, j, in connection with the hook, n, on the inner plate, l, of the alarm, the arm, g, with its opening, h, on the pallet shaft, e, and the clamp, B, attached to the shaft, i, substantially as and for the purpose set forth.

[This invention relates to that class of burglar's alarms which are portable and are designed to be readily detached from and applied to doors and windows. The object of the invention is to obtain a simple device that will be capable of very general application, and one that may be conveniently carried in a valise or trunk by travelers who may apply it, on retiring, to a door or window in a moment of time.]

28,672.—H. W. Jelliff, of Appleton, Ohio, for an Improvement in Dovetailing Machines:

I claim, first, The arrangement of the obliquely-cutting chisels, a a, in combination with the two carriages, j and g, and the adjustable gate, B.

Second, I do not claim the cutter, m, in Fig. 2, except when arranged and operated substantially as shown and set forth.

28,673.—S. S. Jewett, of Buffalo, N. Y., for an Improvement in Cooking Stoves:

I claim the inner brick oven constructed as described, in combination with the outer walls of brick, D D2, for the purposes and substantially as set forth.

28,674.—Alfred Johnson, of Philadelphia, Pa., for an Improvement in Hydrants:

I claim the diaphragm, E, when arranged in the described connection for the purposes set forth.

28,675.—H. L. Justice, of Nashville, Tenn., for an Improved Apparatus for Regulating the Draft and Preventing the Explosion of Steam Boilers:

I claim connecting the piston rod, C, of the piston head, B, with the damper, Q, and the flue doors, u u, by means of the bent lever, G, and the rods, L L and P P (or their equivalents), when the said piston rod, C, is acted upon by the spring, F, and when it is made to act upon the safety valve, K, by means of the bent lever, H—all arranged and operating substantially in the manner set forth.

28,676.—John Lee, of Bolivar, Ohio, for an Improved Machine for Forming Cornices of Sheet Metal:

I claim, first, The use of the wedge or key, D', in the roller or cylinder, D, operating as described and for the purposes set forth.

Second, The arrangement of the adjustable braces, B and B', in combination with the sliding braces, A', as set forth.

Third, The arrangement of the slide, E, brakes, H and H', or roller, D, operating as set forth and for the purposes described.

28,677.—James Lord, of Minersville, Pa., for an Improvement in Fire-arms:

I claim the combination of the parts described for exploding a cap, pellet or pill within the barrel of a gun or cannon, without the use of a vent hole substantially in the manner and for the purposes set forth.

28,678.—Paul Marcelin and Ernest Eude, of New Orleans, La., for an Improvement in the Manufacture of Sulphurous Acid:

We claim the above-described process of making sulphurous acid gas by the use of steam heat, substantially as described for the purposes set forth.

28,679.—W. F. McGahey, of McGaheysville, Va., and H. C. Foote, of Fredericktown, Ohio, for an Improvement in Grain Separators:

We claim, first, A conducting board, d, with sieve, b, in combination with a partially-perforated screen, i h, and apron, j, spout, e f, and angular directors, c, substantially as and for the purposes set forth.

Second, An inclined plate or board, h l, which presents a screening and blasting surface on the same plane, in combination with the inclined conducting board, d, and inclined tailing discharge board, J, substantially as and for the purposes set forth.

Third, An apron, m, having spouts, n, in combination with a conducting screen, p, substantially as and for the purposes set forth.

Fourth, A shoe, a t, containing a conducting board, d, partially-perforated screen, i h, spout, f, apron, j, sieves, k l, conducting screen, p, and apron, m, having spouts, n, in combination with a single revolving screen, r q, substantially as and for the purposes set forth.

28,680.—Marvin Mead, of Bedford, Mich., for an Improved Tweer:

I claim the arrangement with the case, A, of the water passages, C C, the air passage, D, and the disk, B, as constructed—the water being made to pass on two sides of the air passage and entirely around the case, as represented—the several parts being connected, constructed and used substantially as and for the purpose specified.

28,681.—Samuel Moore, of Wellsburgh, Va., for an Improvement in Grinding Mills:

I claim the employment of the horned bail, F, in combination with the notched driver, E, rod, e, spindle, C, and stones, A B, in the manner shown and described, so that the bearing point of the supporting rod, e, upon the spindle will be in a horizontal line or plane with the connecting points between the driver, E, and bail, F—all as set forth.

[The object of this invention is to avoid the lateral and wabbling movement which is frequently given the runners or upper stones of millstones, in consequence of the way in which the runners are hung; the usual curved bail or balance-iron being peculiarly favorable to the production of such result, and preventing a very rapid movement being given to the runners. The invention has for its object a novel ventilating device by which the meal may be kept in a cool state and the runner driven with a great speed, without heating and deteriorating the meal.]

28,682.—Albert Morehouse, of Farmer, N. Y., for an Improved Water Wheel:

I claim the combination with the bucket, 5 (which may be either straight or curved), so inclined as to deflect the water towards the center of the wheel, with the sheeting, 6, set away from the point of the bucket, to allow a portion of the water to pass between it and the point of the bucket, and so curved as to deflect the water against the next bucket substantially as and for the purposes set forth.

28,683.—Charles Miller, of St. Louis, Mo., for an Improvement in Lamps:

I claim the combination of a cooler with the regulators as herein described.

28,684.—D. C. Myers, of Richmondale, Ohio, for an Improvement in Corn Planters:

I claim the arrangement of the hopper, 4, dipping cups, 5 5, hopper, 6, foot valve, 9, connecting rods and crank by which it is connected to the trip shaft, 26, tripping pins, 28, and connecting rods, 16 and 17, operating the dripping cups—the whole being constructed and operating substantially as described for the purposes set forth.

28,685.—Ephraim Pierce, of Cincinnati, Ohio, for an Improvement in Feed-water Apparatuses for Steam Boilers:

I claim the spreader, D, applied between the flues, B B, below the water line to the discharge end of a feed-water pipe traversing the steam space of a steam boiler, substantially as and for the purpose set forth.

28,686.—A. P. Pitkin, of Hartford, Conn., for an Improvement in Steam Radiators:

I claim making a perpendicular radiator, a, with the inside connections, f, and contracted at the bottom, forming the steam, water and air passages at right angles with the sides, substantially as and, for the purpose described.

28,687.—H. A. G. Pomeroy, of Providence, R. I., and R. F. Hudson, of Hartford, Conn., for an Improvement in Plows:

We claim the combined arrangement of the rotary screw-shaped plows, C, on shafts, H H H, arranged parallel with each other and with the path of motion of the machine with the oscillating frame, D, when the whole is constructed and operates as described for the purpose set forth.

28,688.—D. D. Porter, of the United States Navy, for an Improved Marine Propeller:

I claim my improved propeller as constructed with the new arrangement of wings and flanches, substantially as above described and as represented in the accompanying drawings.

28,689.—Jacob Post, of Newark, N. J., for an Improved Door Spring:

I claim the combination with the sliding spring rod, D, and lever, G, of the stepped or inclined rack, B, projection, e, arm, J, and segment, H, in the manner and for the purpose shown and described.

[The object of this invention is to produce a door spring which will operate with its greatest force when the door is closed, and when the door is opened the spring will act with only sufficient force to close it again. The present devices applied to doors for keeping them in a closed state, are very inefficient both in respect to this intention of them and their durability, for however well they may at first operate, they will soon cease to close the door and deep it closed. This invention and improvement in springs for doors, shutters, gates and the like, consists in combining with a helical spring acting upon a bar having on its end a peculiar-shaped rack or lever, furnished on one end with rack teeth, and a lever arm having a friction roller on its end, which arm is acted upon by the spring when the door is in a nearly-closed state, with a force sufficient to keep the door tightly closed.]

28,690.—John C. Rankin, of Mt. Vernon, N. Y., for an Improved Apparatus for Measuring Liquids:

I claim the arrangement, in combination with the gage, G, and case, A, pipe, E, and two-way cocks, F, of the safety air pipe, J, as and for the purpose shown and described.

[This invention consists in attaching to the top of a two-way cock a vessel composed of metal and having a glass face, or a glass cylinder may be used, with suitable marks on its face for indicating the several quantities of liquid to be measured therefrom. This device, when properly constructed and graduated, constitutes the gage which is attached with the cock to the bottom of the reservoir containing the liquid, through which pipe the liquid passes to the gage, to be measured; the top of said gage communicates with the space above the liquid in the barrel, for permitting the air from said gage to escape above the liquid in the barrel as the liquid flows into the gage, thus keeping the parts tight and, at the same time, permitting the liquid to flow into and from the gage freely.]

28,691.—C. W. Richter, of Madison, Ga., for an Improvement in Vapor Lamps:

I claim, first, The arrangement of the air pipes, a a D, and draft tube, C, as and for the purpose shown and described.

Second, The employment of the cork layer, F, in combination with the cylinders, E C, and tubes, a a D, as shown, for the purpose specified.

Third, The lining of cork, h, or other suitable non-conducting substance, placed in the upper part of the wick tube, G, in connection with the cork or other non-conducting substance, k, attached to the under side of the button, j, of tube, I; k and i being arranged relatively with the top of the wick, H, to operate as and for the purpose specified.

[The object of this invention is to obtain a lamp for burning the heavier grades of coal oil with a good illuminating flame. The invention consists in a novel means employed for adjusting or raising and lowering the wick within the wick tube, so that the wick is allowed to remain loose and free from pressure within the tube, thereby favoring the capillary ascent of the viscid oil, and insuring a proper supply of the same to the flame.]

28,692.—Eben Seavey, of Boston, Mass., for an Improved Fire-brick:

I claim my improved fire-brick lining, as made with ribs and air channels or ducts combined or arranged relatively to each other substantially as specified.

28,693.—D. H. Shirley, of Boston, Mass., for an Improved Table Plate:

I claim a plate formed with one or more depressions or receptacles in its rim for the purpose specified.

28,694.—George Smith, of Macon, Ga., for an Improved Hose Pipe:

I claim the hose pipe described, when made in such a way that several nozzles or short sections of pipe are made to be coupled together and secured by means substantially as set forth, for the purpose described.

28,695.—Oliver Snow and H. S. Snow, of West Meriden, Conn., for an Improvement in Lamps:

We claim the method of securing the chimney in its position for use, by means of springs attached to the deflector operating on the inside of the chimney so that no outside circle points on other holders are needed, when the whole is constructed and fitted for use substantially as described.

28,696.—O. W. Stanford, of Cincinnati, Ohio, for an Improved Churn:

I claim the described combination with a vertical, circular tub, A, of the reciprocating rod, C, spherical or spheroidal dasher, D, and spiral wings, d, fitting the interior of the tub—the said parts being constructed and arranged in the manner and for the purposes set forth.

28,697.—Alfred Stauch, of Philadelphia, Pa., for an Improvement in Apparatuses for Inoculating:

I claim the combination and arrangement of the chamber, b, piston, p, spiral spring, h, circular hair brush, k, and ring, g, with the tube, a, spring, d, and needles, n, in the manner and for the purpose specified.

28,698.—W. H. Stevens, of Syracuse, N. Y., for a Toy Gun:

I claim, first, Constructing the metallic wire bow, A, with one or more coils, D, substantially in the manner and for the purpose stated.

Second, Providing bows with metallic wire springs, C, when the same are made with joints, E, for the purpose stated.

Third, Connecting the arrow or projecting rod, N, with the bow-string substantially as stated.

Fourth, The loading chamber, when so arranged with respect to the muzzle as to operate substantially in the manner set forth.

Fifth, The attachment to the muzzle of the gun of a yielding or elastic material (as the springs, P, or equivalent device), when the same operates to hold the ball substantially in the manner set forth.

Sixth, The arrangement of the several parts, or their equivalent, substantially as described, and operating as a whole, substantially in the manner and for the purpose stated.

28,699.—I. C. Tate, of New London, Conn., for an Improvement in Faucets:

I claim the arrangement and combination of the india-rubber diaphragm, C, valve, E, heavy spring, G, light spring, H, and knuckle, F, constructed and operating substantially in the manner and for the purpose stated.

[This invention consists in arranging a heavy spring in combination with a valve closing down on a rubber diaphragm, in such a manner that, on releasing the handle of the faucet, by the action of said spring, the valve is forced down on the diaphragm, and the faucet is closed; it also consists in combining with said india-rubber diaphragm, two prongs, one for the purpose of depressing the diaphragm and to shut the faucet, and the other to force the diaphragm up when the faucet is to be opened; also in the arragement of a knuckle in combination with the valve and diaphragm and with two springs, for the purpose of raising the valve and opening the faucet.]

28,700.—J. S. Topham, of Washington, D. C., for an Improved Hame Tug and Buckle:

I claim the arrangement of the tug, A, the clip, D, and the pin, B; the clip being in two parts and screwed to the tug, and the pin being provided with a head on one end and a screw near the other, when the same are used substantially as and for the purpose specified.

28,701.—Wm. Trapp, of Elmira, N. Y., for an Improved Stave Machine:

I claim, first, The annular cutter stock, H, as constructed, for enabling the staves to pass close to the path of the outer revolving cutters, in the manner substantially as described.

Second, So arranging and operating the two sets of revolving cutters, K and K', that they will act simultaneously but in opposite directions, in the manner substantially as and for the purposes set forth.

Third, The manner of adjusting the two sets of revolving cutters, K and K', so as to dress properly staves of various thicknesses, by raising or depressing the disk, L, of the inner cutters, K', in the manner substantially as specified.

Fourth, The arrangement, in relation to each other, of the two beds, M and M', as constructed, for the purposes set forth.

Fifth, In combination with the stave-dressing machine, N, I claim the rocking plane, Q, as constructed and arranged, for the purposes described.

Sixth, The adjustable spring lever, U U', as arranged, for regulating the pressure of the feeding rollers, in the manner substantially as set forth.

Seventh, In combination with the feed box, N, I claim the sliding spring carriage, X, as constructed and arranged, for the purposes set forth.

28,702.—Joseph Villet-Collignon and Louis George, of Paris, France, for an Improvement in Typography:

We claim the combined types described, composed each of two or more single types united by suitable solder or cement.

28,703.—Richard Vose, of New York City, for an Improvement in Car Springs:

I claim the arrangement and combination of the india-rubber disks, c c, with the concavo-convex metallic springs, e e, in my improved car spring, substantially in the manner and for the purpose set forth.

28,704.—Edward Wade, of Norwich, Conn., for an Improvement in Pumps:

I claim the arrangement and combination of the horizontally rotating cam disk, A, rising and falling yoke, F, and series of lazy-tongs, G, constructed and operating substantially in the manner and for purpose specified.

[This invention consists in the arrangement of a horizontally rotating cam disk, in combination with a rising and falling yoke and with a series of lazy-tongs, in such a manner that, by rotating the disk, a rapid reciprocating motion is imparted to a pump piston or other part of a machine attached to the extreme end of the lazy-tongs.]

28,705.—Wm. Watson, of Lowell, Ill., for an Improved Neck Stock:

I claim a stock of hard vulcanized gum as a new article of manufacture.

28,706.—Wm. H. Wiley, of Lockport, N. Y., for an Improved Butter-worker:

I claim the arrangement of the revolving table, F, upon the platform, A, the head or worker, E, the standard, D which is adjustable laterally and horizontally, the lever, C, and the slide, G, when the same are used substantially as and for the purpose specified.

28,707.—Richard Williams and Samuel Wilson, of Buffalo, N. Y., for an Improved Feathering Paddle Wheel:

We claim the stationary cam-grooved core, A, in combination with the crankshaft of the paddle and revolving cylindrical drum, H H1 H2, for the purpose substantially as described.

We also claim, in combination with the above, the arrangement of the stationary shaft, B, revolving shaft, J, and drum heads or hubs, H1 H2, substantially as set forth.

28,708.—S. E. Woodworth and J. S. Wethered, of San Francisco, Cal., for an Improvement in Gas-burners:

We claim the introduction of atmospheric air into the center of the gas flame, in the manner substantially as described and for the uses and purposes set forth.

28,707.—Wendell Wright, of New York, for an Improvement in Gas-burners:

I claim the partition plate, A, in combination with the piston, C, and valve, B, as described, and for the purposes set forth.

28,710.—Linus Yale, Jr., of Philadelphia, Pa., for an Improvement in Locks:

I claim the pieces M and F, when used in the manner (or an equivalent manner) and for the purpose substantially as described.

28,711.—M. R. Clapp (assignor to Silsby, Mynderse & Co.), of Seneca Falls, N. Y., for an Improvement in Steam Boilers:

I claim the arrangement of the inner tubes, G G, loosely within the outer one, with the lower ends below the fire and both their upper ends below the water level, substantially as specified.

28,712.—G. W. Banker, of Medford, Mass., assignor to himself and G. O. Carpenter, of South Reading, Mass., for an Improved Method of Securing Heads in Barrels:

I claim securing the heads of barrels or kegs, when composed of a series of staves, by means of a screw, as set forth, for the purpose specified.

28,713.—Wm. E. Durkee (asssignor to himself, A. S. Williams and J. H. Hopkins), of Fort Edward, N. Y., for an Improvement in Hay Elevators:

I claim the supporting frame, A, the inclined plane, C, jointed to the same, and the several parts combined therewith, as described, for the purposes set forth.

[The object of this invention is to afford a simple and cheap means whereby wagons or carts loaded with hay may be more easily and rapidly discharged, either into cocks or into barn windows.]

28,714.—E. A. Godfrey (assignor to Rogers, Smith & Co.), of Hartford, Conn., for an Improvement in Soldering Handles of Cutlery:

I claim the rods, A A, attached at one end to the cap, B, and having a plate, D, springs, F F, and nuts, E E, fitted on them, substantially as and for the purpose set forth.

[The object of this invention is to avoid the necessity of wiring the handle on the tang, as hitherto, in order to solder the handle to the tang, and thereby effect a considerable saving in time and greatly facilitate the work. The invention is applicable to metal handles, such as are most generally plated and formed of metal shells, swaged or struck-up in proper form, and connected together by solder.]

28,715.—E. A. Godfrey (assignor to Rogers, Smith & Co.), of Hartford, Conn., for an Improvement in Soldering Handles of Cutlery:

I claim the swivel plate, D, with the adjustable plate, H, and rods, F F, attached; the whole being arranged to form a clamp, substantially as and for the purposes set forth.

[The object of this invention is to facilitate the securing together of the two longitudinal parts of metal handles for cutlery, so that said parts may be readily clamped, and, at the same time, held together for the purpose of being united by soldering.]

28,716.—A. I. Gove (assignor to himself and Withered & Tiffany), of San Francisco, Cal., for an Improved Ships' Windlass:

I claim the arrangement of the gearing as represented by G and I I, with the crank plates or arms, H H, combined with the connecting rods, S S, the levers, K K, and pawls, P P, working the windlass, C, substantially as described and for the purposes set forth.

28,717.—J. C. Jennison and Augustus Hale (assignors to E. J. Hale and Augustus Hale), of Foxcroft, Maine, for an Improvement in Lamps:

We claim the arrangement and application of the spring clasp and its angular notches to the chimney carrier, so as to enable the clasp to be turned upward from, and to operate with, the notches and confine the chimney in place in the carrier, substantially as described.

We also claim the improved chimney carrier, as made to embrace, and close down upon and connect to, the lamp cap, and be separate from the deflector, and to have a shell or flanch for supporting the chimney arranged upon it, essentially as specified.

28,718.—E. M. Lewis (assignor to himself and George Williams), of Philadelphia, Pa., for an Improvement in Slide Valves for Steam Engines:

I claim the combination of the valve, B, outer box or casing, D, its rollers, d d, springs, f f, or their equivalents, and the power, C; the whole being constructed and arranged substantially; and for the purpose set forth.

28,719.—Thomas Morrison (assignor to C. P Safford), of Kingston, N. Y., for an Improved Chronometer Escapement:

I claim the arm, B (Fig. 1), of the depting bar, the form and peculiar position of the feather spring, D, acting in combination with, and and attached to, the depting bar, A, as a lever, the pin, C, in the arm of the depting bar, the notches, F and G, in the friction roller (Fig. 2) attached to the balance wheel, and the combination of the parts (as shown in Fig. 3) substantially as set forth and described.

28,720.—Levi Short (assignor to himself and C. S. Pierce), of Buffalo, N. Y., for an Improvement in Apparatuses for the Manufacture of Illuminating Gas:

I claim, first, A gas furnace, D, constructed and operated substantially as described, in combination with the retort, C, and retort house, B, for the purposes set forth.

Second, I claim the relative arrangement of the oil reservoir, A, retort house, B (including the retort and furnace), purifier, L, and gasometer, N, substantially as described, for the purposes set forth.

28,721.—I. N. Whitaker (assignor to himself, J. H. Frees and M. Hellar), of Foreston, Ill., for an Improved Apparatus for Heating Wagon Tires:

I claim the combination with the outer periphery of the tire box, B, of the furnace, D, and smoke box, C, when the said tire box is arranged to stand vertically, as shown, and is provided in its upper part with rollers, J J, by which the tires are suspended and rotated; all as set forth and represented, for the purpose specified.

[This invention consists in heating tires for wheels of any description by confining them within a suitable furnace and giving a revolving motion to the tire or tires by any suitable means of hanging them on, or by any proper prime-mover, so as to submit them uniformly to the direct heat from the fire. The apparatus is so constructed that it will be easy of manipulation, and so that it may be used equally as well within the workshop as out of it.]

28,722.—S. H. Whitaker (assignor to himself and Wm. L. Thomas), of Cincinnati, Ohio, for an Improvement in Gas Regulators:

I claim, first, In the described connection with receiving and discharging chambers, A and B, and a stationary seat, F, supported on a stem which passes through the diaphragm, the valved diaphragm, D E, or its equivalent, operated by the unequal pressures, on its opposite sides, of the entering and escaping gas, substantially as set forth.

Third, The nut, H, rod, G, and seat, F, in the described combination with the valve, E, for the purpose of adjusting the capacity of the apparatus from the exterior.

RE-ISSUES.

Wm. S. Carr, of New York City, for an Improvement in Water-closet. Patented Aug. 5, 1856:

I claim, first, A cylindrical plunger or plug, 3, substantially as specified, acting to close the water passage, 2, at the time the water-closet seat is depressed irrespective of the weight on the seat, as distinguished from a valve which requires compression to a given point before closing, as set forth.

Second, I claim the valve, g, cylinder, 3, and openings, x, in combination with the seat, v, and acting in the manner and for the purposes set forth).

Third, I claim, in a valve for water-closets, a cup leather for controlling the motion of said valve in closing gradually, substantially as specified; said cup leather moving freely in one direction and closing against the containing cylinder in the other direction, and the leakage of water in said cylinder allowing the movement of said cup leather, as set forth.

Fourth, I claim the lever, p, acted on by the seat and simultaneously controlling the movements of the pan, r, and valve or cock for admitting water, as specified.

Fifth, I claim the combination of the lever, p, latch, t, and valve spindle, g h, as described, for regulating the movements of the pan, r, as set forth,

Sixth, I claim the valve for admitting water to the closet, in combination with the trunk or hopper, when said valve is connected directly to the said hopper, for the purposes and as set forth.

Seventh, I claim, in a water-closet in which the cock is attached to the hopper, a hollow arm, o, or opening into said hopper, substantially as specified, for conveying leakage from said cock into the hopper, as set forth.

J. P. Collins, of Troy, N. Y., for an Improved Water Wheel. Patented Dec. 6, 1859:

I claim, first, The arrangement of the lighter plate, L, in the particular manner specified, and for the purpose set forth.

Second, The arrangement, in the particular manner specified, of the packing ring, i, for the purpose set forth.

Third, The arrangement, in the particular manner specified, of the lip or projecting piece, e, of the buckets, for the purpose set forth.

Fourth, The arrangement, in the particular manner specified, of the regulating plate, J, in combination with the peculiar specified device for operating it, for the purpose set forth.

Fifth, The employment or use of the dividing strip or ring inserted in the buckets, substantially as and for the purpose set forth.

Sixth, The fitting of the lower part of the box, G, over the annular flanch, n, of the wheel, as shown, or in an equivalent way, so as to form a joint as nearly water-tight as may be in connection with the openings, l l, in the plate, d, and the oblique plates, m, at the sides of the openings, as and for the purpose set forth.

Seventh, The employment, for united use in one wheel, of the lighter plate, B, packing, i, projecting lip or flanches, e, gage or regulating plate, J, and annular dividing plate, A*, the whole being constructed, arranged and operating in the manner and for the purpose set forth.

Nathaniel Drake, of Newton, N. J., for an Improvement in Corn-shellers. Patented April 3, 1860:

I claim, first, The combination of a plate, E, which presses directly upon the ear while the corn is being shelled therefrom, with a spring, F, arranged and operating as and for the purposes set forth.

Second, I claim the combination of the adjustable guard chain, j, with the plate, E, and spring, F, whereby the plate is prevented from falling against the shelling wheels, although free to adapt itself to different sized ears, and whereby the plate, E, and spring, F, can be raised by an attendant while the machine is in operation, substantially as described.

Third, I claim the combination of the plate, E, spring, F, with the wheels, B and D, constructed and arranged to operate in relation to each other, as and for the purposes set forth.

Fourth, I claim the combination of the adjustable shaft, e, with the plate, E, substantially as set forth.

Fifth, I claim the arrangement and combination of the obliquely-acting adjustable spring, F, set screw, k, plate, E, and adjustable guard chain, j, as and for the purpose shown and described.

P. G. Gardiner, of New York City, for an Improvement in Springs for Railroad Cars and Carriages. Patented April 26, 1859:

I claim primarily the combining and arranging two blades, bent elliptically, with an intermediate plate curved or corrugated, so as that the intermediate plate acts only by tension or strain apart from end to end, in the manner and for the purposes described.

I also claim the manner described of securing together the elliptical blades and tension bar at the ends without rivets, pins, bolts, hinges or screws.

William Godsoe, of Manchester, Mass., assignor to himself and Isaac Ayers, for an Improved Steering Apparatus. Patented June 7, 1859:

I claim the described steering apparatus, consisting essentially of the toothed segment, M, traversing on the curved way, P, and operating substantially as described.

John Wyberd, of New York City, for an Improved Night-light Reflector. Patented April 10, 1860:

I claim the arrangement of a series of reflecting surfaces in an arch or dome form, over gas burners, so as to permit a current of air through the reflector and strongly illuminate objects below the light.

Turner Williams and David Heaton, of Providence, R. I., assignees of said Turner Williams, for an Improved Window Stop. Patented Oct. 26, 1858:

I claim the described window stop, consisting of the roller, C, the shank, m, spring, E, and lever, K, or their equivalents, in combination with the inclined surface, d, and operating substantially as set forth.

ADDITIONAL IMPROVEMENT.

J. C. Dickey, of Saratoga Springs, N. Y., for an Improvement in Machinery for Crushing Quartz. Patented May 16, 1860:

I claim a stamper or stampers working in a mortar made on the top of a stationary cone by a hollow-revolving cone working on and projecting above the top of the said stationary cone, with the pulverizing surfaces made by the said cones coming in contact with each other, in combination with the projections, l l, made on the base of the said revolving cone, working in and on the side of one or more channels made on the base of the said staticnary cone, for the purpose of crushing, grinding and pulverizing quartz rock and earth containing gold, and forcing the said pulverized rock and earth into the bottoms of the said channels, in contact with quicksilver, for the purpose of securing the gold.

EXTENSION.

R. D. Granger, of Albany, N. Y., for an Improvement in Cooking Stoves. Patented June 13, 1846:

I claim locating the pipe communicating from the body of the stove to the elevated oven between the two back boilers, so that its front lower edge shall be contiguous to the fire, in combination with the division strips, h h h h, and the dampers, j j, arranged and operating as described and shown, viz., so as to form one center flue beneath the connecting pipe, k, which flue may be closed at pleasure by the damper, j j, in order to throw the heat through two side flues, i i, and cause it to pass under the rear boiler before it escapes into the connecting pipe, k.

I further claim forming the connecting pipe of the horizontal section shown and described; that is to say, having the pipe made broad on its front side next the fire for the purpose of obtaining a large capacity of pipe, and also to bring the broadest portion of its section in contiguity with the fire and accommodate the boilers in the rear.

DESIGNS.

A. C. Barstow, of Providence, R. I., for a Design for a Cooking Range.

Gardiner Chilson, of Boston, Mass., for a Design for a Cook's Range.

S. G. Smith, of New York City, for a Design for a Nut-cracker.

L. W. Volk, of Chicago, Ill., for a Design for a Bust of Abraham Lincoln.

S. W. Gibbs, of Albany, N. Y., assignor to North, Chase & North, of Philadelphia, Pa., for a Design for a Stove.

J. L. Jones (assignor to himself and A. McDowell), of Slatington, Pa., for a Design for an Ornamental Ridge for Roofs.

E. J. Ney, of Lowell, Mass, assignor to the Lowell Manufacturing Company, for a Design for Carpets.

E. J. Ney, of Lowell, Mass., assignor to the Lowell Manufacturing Company, for a Design for Carpet Patterns.

N. S. Vedder, of Troy, N. Y., assignor to Tibbets & McCoun, for a Design for a Cook's Stove.

Notes & Queries.

J. M., of Ohio.—The practice of betting, even on questions of science, is a most unscientific way of making money, which we emphatically condemn. Abjure it forever, and you will become a richer if not a better man. In answer to your question, however, we will state that your friend is right, and you have lost your wager, inasmuch as a gambler gazing upon a table could easily count the number of cards or coins spread upon another table in an adjoining room separated by a brick wall. For the philosophy of this paradox we refer you to page 325 of the present volume of the SCIENTIFIC AMERICAN.

D. S., of Ill.—We do not know where Dr. Maynard's rifles are manufactured. We believe he resides in Washington, D. C., and he can give you all the information you request concerning them.

J. W. W., of Iowa.—A cubic foot of hydrogen gas will raise about half an ounce at the surface of the earth. Oiled silk will expand and contract, and answer your purpose for a balloon.

J. L. L., of Iowa.—We do not recollect having received your former letter. Steam may be carried down to a depth of 200 feet in a mine with well-covered copper pipes, and its pressure maintained at nearly the same rate at the bottom as in the boiler above ground.

J. C. R., of Mich.—Not a single fact has yet been adduced worthy of notice in proof of a pre-Adamite race of men. The ridiculous attempts made by quasi-scientific men, to do this from broken china-ware dug up in Egypt and old flint arrows exhumed in France, are not worthy of attention from men of sound judgment.

McA. & Bros., of Ind.—Molds for wax figures are made of plaster, and are not oiled, but are first steeped in hot water for about half an hour, and then dried thoroughly. You state that your wax figures have adhered to both iron and plaster molds, and add you used "almond oil" in them. This explains the cause of failure. When you pour the wax into the plaster mold, allow it to become dry, then place the mold in water, after which the cast will be easily removed.

G. M. Jr., of Ill.—Two lightning-rods on a building—one at each end—are frequently connected together by a horizontal rod of the same size. In the absence of such a horizontal rod, common wires may be usefully applied to effect the same object. It is very dangerous, as you state, for persons to seek shelter under trees during a thunderstorm, because lightning always takes the nearest and best conductor to the earth, hence it passes in preference from the cloud by the tree.

D. H. Jr., of N. Y.—The aluminum bronze has been patented in England, and its mere application to any purpose, excepting as new articles of manufacture, is not patentable.

G. R., of Vt.—Your idea in regard to obtaining butter from milk is to apply an air-pump to the churn and exhaust all the air from the cream, by which operation you expect the cream to swell, and the butter globules to burst from it, and float on the top in golden-colored balloons. You ask our advice about trying the experiment. We exhort you to use your own judgment in the matter, but inform you that your plan is the very opposite of that which is carried out in what are called atmospheric churns. In these air is forced in to swell the globules, not exhausted, as you propose.

O. P. P., of Ind.—Rough sea shells can be polished smoothly by first rubbing them down with a file, then with emery paper, and finishing off with rottenstone or tripoli. Some shells, when polished, have a very beautiful appearance, but those which possess the most variegated hues and glossy surface are found so in their natural state.

H. A. B., of N. Y.—We do not know what you mean by inquiring, "Does the velocity of water give the overshot an advantage over the breast wheel?" Venice turpentine is extracted from the larch pine, and contains succiinc acid. It came from Venice first to England, hence its name. We have not space to give you a treatise on dialling. Any old encyclopædia will furnish you with the information.

C. F. R., of N. Y.—The constant operations of a siphon depends upon the pressure of the atmosphere on the outside, and a perfect freedom from gas or air inside. If carbonic acid or sulphurous gas in the water gets into the siphon, it offers resistance to the outside pressure, and as a consequence, the flow of water is impaired. You will always find it difficult to keep a siphon free from air and gas; make up your mind to irregularities in its operations.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, June 16, 1860:—

J. M., of N. Y., $30; J. S., of N. Y., $30; W. J. C., of Pa., $250; H. N., of N. Y., $30; C. J. S., of N. Y., $55; W. D, M., of Va., $55; J. C. A., of Texas, $30; E. M. J., of N. Y., $25; J. W. T., of Vt., $25; W. S. H., of Miss., $25; N. A. P., of Tenn., $110; M. F. J., of Tenn., $32; J. B. F., of Ohio, $25; J. R. L., of Mass., $30; W. M., of Mass., $25; R. M. G., of N. Y., $30; H. B., of N. Y., $20; D. C. T., of Wis., $30; L. & L., of N. Y., $30; J. W. D., of Tenn., $30; H. Y. W., of Pa., $30; J. B. S., of Mich., $30; J. I. B. R., of N. Y., $30; A. J., of N. H., $25; P. & O., of N. Y., $25; J. H. H. B., of N. Y., $10; J. S. G., of Mich., $5; C. & M., of Texas, $5; C. C., of N. Y., $25; S. A., of N. Y., $30; E. S. C., of Mass., $25; E. & W., of Ga., $5; C. E., of La., $50; E. C., of La., $25; J. C. C., of Conn., $1,550; A. H., of Iowa, $10; A. A., of N. Y., $30; G. W. L., of N. Y., $30; J. L. B., of N. Y., $30; L. S. & J. E., of N. Y., $30; S. U. C., of Md., $100; J. E., of Tenn., $25; A. J. V., of Mo., J. B. W., of Pa., $30; J. M. H., of Cal., $10; C. M. Y., of N. Y., $25; J. F. K., of N. Y., $30; H. L., of Ind., $25; C. H. B., of R. I., $30; J. H. H., of Ga., $30; W. H., of Ill., $30; S. S., of Mass., $30; E. B., of Mich., $30; O. H. W., of Miss., $30; H. & S., of R. I., $250; J. B. McE., of Pa., $15, J. H. F., of Cal., $30; T. O. S., of Cal., $25; H. & P., of N. Y., $300; P. K., of R. I., $20; J. W. B., of La., $15; C. G., of Mich., $30; D. T., of Ohio, $30; S. J. P., of S. C., $30; M. B., of Ohio, $30; H. H. H., of Pa., $30; J. G., of Fla., $30; W. E. B., of Conn., $50; H. F., of Ind., $25; S. A., of ——, $30; T. & G., of Miss., $30; H. A. R., of Ohio, $21.80; J. S., of Pa., $25; J. E. L., of N. Y., $55; C. G. G., of Ala., $25; J. J., of Maine, $30; W. H. G., of N. Y., $30; W. H., of Ohio, $30; I. G. M., of N. Y., $30; W. F., of Mass., $60; W. W., Jr., of Pa., $250; E. S. B., of N. Y., $30; Z. D., of Ga., $25; E. H. B., of Mich., $55; J. C. of S. C., $30; W. J. S., of N. J., $30; C. & L., of N. Y., $25; F. N., of N. Y., $25; W. H. D, of N. Y., $25; A. S., of N. Y., $25; E. W., of N. J., $25; H. L. N., of N. Y., $25; C. P., of N. Y., $75.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 16, 1860:—

N. A. P., of Tenn.; J. B. F., of Ohio; E. M. J., of Conn.; W. S. H., of Miss.; J. W. T., of Vt.; R. S. W., of Ga.; K. & H., of N. Y.; A. L., of Mich.; F. A. G., of Ill.; D. W. M. L., of Iowa; G. V. C., of N. J.; N. Q. M., of Wis.; O. & L., of N. Y.; G. A. L., of Ill.; F. N., of N. Y.; J. C. C., of Mass.; W. H. D., of N. Y.; A. S., of N. Y.; H. L., of Md.; O. H. W., of Miss.; E. B., of Mich.. J. H. B. B., of N. Y.; A. M. W., of Ga.; E. S. C., of Mass.; H. B., of Ohio; C. C., of N. Y.; J. H. B., of N. Y.; B. & T., of Ohio; A. J., of N. H.; J. W. D., of Mass.; W. M., of Mass.; H. L. N., of N. Y.; E. M., of N. J.; J. S. G., of Mich.; T. E., of Tenn.; E. C., of La.; A. J. V., of N. P.; C. M. Y., of N. Y.; M. D., of Minn.; J. O. C., of Conn.

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ILLUSTRATIONS.

MISCELLANY.

* Figures followed by stars refer to illustrated articles.

PATENT CLAIMS.

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