

A SHORT  
DESCRIPTION and LIST;

With the PRICES of the

Instruments of Husbandry,

MADE IN THE

F A C T O R Y

A T

*Laughlinstown, near Celbridge, in  
the County of Kildare.*

Established and Conducted

By Mr. JOHN WYNN BAKER,

Under the Patronage and Encouragement of the

Right Honorable and Honorable DUBLIN SOCIETY.

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M D C C L X V I I .

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# INTRODUCTION.

To the READER.

**W**HEN I began this Factory, I had no Conception that the Demand would, in many Years, be equal to the Calls of the past Year, and therefore the Plan was originally calculated upon a small Scalé. The unexpected Demand, I am sorry to observe, proves the Want of good Instruments for all the Branches of Agriculture in this Kingdom. Sensible of this Inconvenience, the Gentlemen who generously, in behalf of their Country, bend their Attention to that *Support* of every other Science and Manufacture, have heretofore been importing Instruments from such Parts of the World, as they have imagined could best supply them. But from a real Want of an Establishment of this Kind, for the making all Kinds of Instruments for Husbandry, the Importation of useful ones has not answered the laudable Purposes of the Importers; at least the Instruments have not been so generally introduced, as every Man of generous Sentiments must believe to have been the Intention of the Importers; for when they have been landed, they have been immediately carried to the Neighbourhood of the Importer, and at best, brought into Use only in that particular District; so that if a good Instrument should, by this Means, be introduced in the *North*, the *South* could receive no Benefit from it, and so, *vice versâ*: from which Cause the general Introduction of good Instruments must have been slow. But when we add the Consideration of an Unwillingness in Mechanicks to make from the Patterns so imported, and what is quite as inconvenient, a Want of Men to shew the Use of them, it is

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not to be wondered at, that Tillage is in no better State in *Ireland*, than it is in many Parts of *England*, where it is, from the same Causes, in as bad a State, I believe, as in any Part of the World; at least, any Part which pretends to the Practice of Agriculture. From the latter Cause, it has too often happened, that Instruments of real Use have been thrown aside, neglected, and abused, until they became unfit for the Use of the most experienced Hand.

It was conceived, that if a Factory were established, for making Implements of Husbandry, it would be a Means of dispersing throughout the Kingdom, Variety of Instruments of the best in their Kinds; but that alone would not have done, if the Maker had not a competent judgment in the Use of them, and a Notion of constructing such new ones as have been wanting, and improving such as have been defective. How far I have answered that Expectation of my Patrons, I shall submit to the candid Consideration and Experience of the Public.

In the mean Time I hope I shall be pardoned for believing, that my Factory has already prevented the Importation of many Machines for Agriculture, and put *Ireland* in Possession of several useful ones, which are to be found in no other Country.

Had this Factory been established in any remote Part, its Effects could not have been diffused through the Kingdom, as, I believe, the Demand will shew it to be. Had it been established immediately in the Metropolis, it would likewise have been less effectual, I am willing to believe, than it has been in its present Situation; for this plain reason, that the mere looking at the best Machines for the Manufacture of land, could not be sufficiently persuasive of their Importance and Use, unless the Management of them in the Field, or, at least, the Effects of their Operations could be seen. The Situation, being not beyond a Morning's Ride from *Dublin*, gives all People, from every Part of the Kingdom, who are occasionally brought to the Metropolis by other Calls, an Opportunity of examining, not only into the Nature and Quality of the Machines, but the different Methods of

of Husbandry carried on with them. The Reports of such as have been here, have induced others, not only to come when they happen to be in *Dublin*, but what must be conceived as more grateful to me, to undertake a Journey of more than an hundred Miles, on Purpose to spend some Days with me. It will hardly be necessary for me to say, it could not be from any personal Acquaintance, because it is well known I am a Stranger here; but from a Zeal in the Cause of Agriculture, which, I have the Pleasure to observe, is peculiar to the Gentlemen of *Ireland*.

I must be allowed to say, that I have frequently, since the Commencement of this Undertaking, felt great Concern, that it has not been in my Power to give so general a View of the different Machines I make, as I wish to do, to those who come on Purpose to see them; but it will be considered, that as fast as they have been finished, they have been sent away, because the Demand has always exceeded the Possibility of execution; besides which, I really have not Buildings to keep an Assortment in; a Point which I am exceedingly anxious to obtain, for the speedier Dispatch of the Orders, and the greater Convenience of the Public.

And I hope it will not be looked upon as extraordinary, that I am not equal to the erecting such Buildings as are necessary to the conducting so great a work as this is now grown, when it shall be considered, that it is very little more than a Year, since the Building which I had erected for a Part of this Undertaking, my Dwelling-House, Materials, and Part of my Furniture were consumed by Fire. And indeed, were it ever so compatible with my Circumstances, I know not whether it would be altogether so prudent, to lay out a large Sum of Money, for carrying on a Work, in which the Public are much more interested, than I can possibly be as an Individual; for I believe it is a well-known Fact, that many Machines which are purchased of me, are intended only as Patterns for others to work by; a Circumstance, which calls for Circumspection and Caution on my Part, in the Opinion of many. These Considerations, added to the unhappy Event of the Fire, *which*

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*came upon me by this Undertaking*, had almost persuaded me to decline this Façtory; but when I re-considered who were my Patrons, and the Country I was serving, I could not harbour a Doubt, but my Labours and Misfortune would, at the proper Time, obtain the friendly Interposition of *those*, who will consider them candidly and generously. Animated with these Hopes, I have persevered in the Re-establishment of this Undertaking, at an Expence, and under Difficulties, which Timidity and Diffidence would tremble at.

I have understood, that it has been imagined, the Loss I sustained by the Fire has been fully made up to me. I wish I could confirm such Imagination; but the Case was far otherwise, though I shall defer, for the present, entering further into the Particulars of that distressing Event, than to seize this first public Opportunity, of declaring myself much indebted to the Friendship of the Gentlemen who have appeared on my Behalf, and whose Names are too well known, to need a Repetition.

But although my Instruments and Methods of Husbandry are passing into many Parts of the Kingdom, with a Rapidity, which the greatest Vanity on my Part could not have expected; yet, should I live, to be by any Means enabled to carry my Undertakings for the general Improvement of Agriculture in *Ireland*, to that Extent, which, what I have done, assures me is infinitely wanting, I do flatter myself, that a very few Years might be productive of this Kingdom's obtaining the first Character in the Article of Tillage, which will necessarily pave the Way to Perfection in every other useful Art, as the Neglect of it, must, on the contrary, be attended with the most fatal Consequences both to the Affluence and Honor of the Nation. But I shall defer saying more upon the extending my Plan, till another Opportunity.

I shall now endeavour to give a short Account of the Uses of some of the Instruments named in the following List, every one of which I have numbered, for the more convenient Reference of the Reader.

*A short*

*A short Account of the Uses of the Instruments, referring, by the Numbers, to their Names, and the Description of their Parts in the List of them hereafter given.*

**M**Y former Publications have shewn, that the Instruments for the Drill Husbandry are calculated only for that particular Species of Culture; and therefore I shall take no other Notice of their Uses in this Place, than just to say, that for the Information of those who may adopt that particular Husbandry, I have ranged the necessary Instruments together, that they may appear at one View, under the Heads, N<sup>o</sup>. 1, 2, 3, 4, 5, and 6, in the List.

N<sup>o</sup>. 7. Contains an Account of the necessary Harness for the using these Instruments, the bulk of which, it is to be presumed, most People have; those who have them not, will please to order them with the Machines, otherwise they will not be sent,

N<sup>o</sup>. 8. Is a Drill Plough, to which I have given a Place in my List, because I have met with some Persons, who have conceived an high Opinion of that Species of Husbandry, for which that Plough is calculated. My Sentiments upon *that Practice* of the Drill Culture will be found in my Report for the Year 1766, Page 38.

N<sup>o</sup>. 9. Is a Plough which has been found to answer all the Purposes of the breaking and manufacturing Fallow of any Kind; the Draft has been found easy to the Cattle, and the Plough, from the Manner in which it is fortified with Iron in every Part subject to Distress, is rendered irresistible, save, that the Coulter, Sock, and Ground-Plates, from the constant Friction in the Soil, must wear, and therefore will sometimes want repairing. What recommends this Plough very much to the Practice of the common Ploughman is, that it approaches the Plough he has been used to, more than any other I make, except the Chip-Plough, N<sup>o</sup>. 10, which I cannot recommend the Use of to any Man, because the Chip is never large enough to take a Share with a large Socket, by which Means all Chip-

## The Description of the Uses of the

Ploughs are apt to break off behind the Sock or Share; whereas, my Socks are made large in the Socket, and are always put upon the Point of the Cross.

The Plough, N<sup>o</sup>. 11. is calculated for throwing up the last Sod, in sowing Wheat under the Plough in small Ridges, in order to bring the Furrows narrow in the Bottom; and which I believe answers the Purpose very well, though I have not used it myself, for Reasons which will appear presently. See p. 9. No. 15.

N<sup>o</sup> 12. Is a Plough for the Purpose of skinning Ground for burning; and I have the Pleasure to understand, that this Plough has compleatly answered the Purpose to those who have used it. I shall just be allowed to say, that the burning some Kind of Land is undoubtedly a very good Practice, upon its first Improvement; but in other Cases it is altogether as bad a Practice as can be introduced. See my Hints upon Husbandry, published by Mr. *Flinn* in *Castle-street*.

N<sup>o</sup>. 13. Is a Plough calculated for two Horses, said by some People to be capable of the first breaking, and compleatly manufacturing any Ground for Fallow. I must dissent from that Opinion, because I am sure there is much more Land which two Horses cannot effectually break, than there is which they can. To support this Opinion, of two Cattle being sufficient to break Land in general, shallow plowing is recommended as a general Practice; a Practice so contrary to all Principles, that it is hardly worth answering. But let any Man *carefully* examine the Roots of the Plants which are in the Farmers Department, and he will find, that they pass a great Way into the Soil, if the Tiller will, by proper Tillage, allow them to do so; but if he will only just skin the Surface, particularly in a strong Soil, he must not expect the Roots of small Plants to penetrate in Search of Food, where he has not introduced his Coulter and Share to a proper Depth; and with the Strength of two Horses he cannot; though I defy any Man to hurt this Plough, as I make it, with four, by fair Work. But if, from a Plan of Oeconomy, the Farmer wishes to introduce this Plough, he certainly



tainly may do it to Advantage, after he has deeply broken his Fallow, and well reduced it by the Harrow, provided he does not let it remain too long to consolidate. And if, by this Saving, he can be prevailed upon to add one more ploughing than usual, he will undoubtedly find his Account in the Use of these Ploughs in the manufaturing his Land; but 'till he can be dispossessed of the inconsistent Notion of its being possible to make his Land *too fine*, I fear we shall not introduce the Extra-ploughing. The established Method of not exceeding four Times ploughing Fallow, is founded in Ignorance; every Fallow should be ploughed, until it is well reduced to receive the Seed.

N<sup>o</sup>. 14. Is the Lomax-Plough for four Cattle, to draw double, and is such a one as Pra<sup>c</sup>tice has induced many People to approve, I having sold many of them; but every common Ploughman does not like them so well as they do the one I mentioned before, N<sup>o</sup>. 9, neither are they, indeed, so fit for *stony* land, as that, but in every other respect, answer all the Purposes of compleatly working fallow.

N<sup>o</sup>. 15. Is the Plough which I have called, in my Report for the Year 1766, p. 40, the *Seeding* Plough; in the Use of which the Farmer will find many Advantages: but I shall say no more in the Recommendation of it, than to refer him to the Report already mentioned, and leave his Experience to examine the Merit of the Instrument, in the sowing Corn under the Plough. I before said, when I was speaking of the Hunting-Plough, N<sup>o</sup>. 11, that for Reasons which would appear presently, I never had used that Plough; which are, that I find this Plough answers all the Purposes of *that* and the four Horse Ploughs, which are used for the *sowing* or rather *burying* Wheat. Some indeed, who pay Attention to their Tillage, have very properly had two of these seeding Ploughs, which, with one four Horse Plough, we call a Set of Ploughs for the common Husbandry. The two small ones are the one wider, the other narrower in the Sole: the latter of which always follows the wider one, and clears up the Huntings, by which the Work goes on mathematically; whereas,

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whereas, it would be inconsistent, in finishing the Ridges, to have the wider Plough following the narrower. A Point not sufficiently attended to in the general Construction and Use of Ploughs.

N<sup>o</sup>. 16. Is a Plough of the same Kind, to be worked with only one Horse, either in the Field or Garden, which I think may very advantageously be introduced in the Field for sowing Corn under the Plough in broad Ridges, provided the Land be first *well manufactured*; and I am so convinced of it, that this Year I intend to sow ten Acres with this Plough, but then I shall add a small Harrow to hang to the Plough, to be drawn by the same Horse. See Report for 1766, p. 42.

N<sup>o</sup>. 17. Is a Plough which is calculated for keeping Land flat in its Tillage; I presume first introduced on very dry Land, the better to retain Moisture, in which, I have no Doubt, but that it may answer; and it has also been introduced for the Purpose of laying Land flat, which is intended for Lawns and Meadows. I shall not enter into the Merits of this Instrument, further than to say, that I have endeavoured to divest it of the Wheels, by which to render it a cheaper and less complicated Machine, than it can be when worked with a Carriage.

N<sup>o</sup>. 18. Is a Plough, which Mr. *Tull* sensibly calculated for the speedier Reducement of Ground; but the Draft of it is no less heavy than its Expence; and at the Time he invented this Plough, the Scarificator, No. 22, had not been thought of. But as we are now in Possession of that Machine, which will so effectually cut the Ground into Slips or Strings of three Inches broad, that by preceding the four Horse Plows, N<sup>o</sup>. 9 or N<sup>o</sup>. 14, a little while before the Ploughs begin to turn the Land, all the Purposes of Mr. *Tull's* four-coultured Plough will be answered.

N<sup>o</sup>. 19. and 20. Are Wheel-Ploughs, which, from my Observations upon their Operations, I conceive cannot be so effectual in general Use, as Ploughs without Wheels, for this plain Reason, that as the Wheels are the Gauge for the Depth of the Plough, wherever

wherever they meet with any Thing which raises them, the Plough consequently rises so as to plough shallow, and sometimes not to touch the Surface; at other Times, when the Wheels sink into any Declivity, the Plough immediately sinks in Proportion, so that the *Ploughing* is render'd irregular by those Kinds of Accidents, and will continue to be so until the Ploughs have been at Work upon the same Land for some Years. Another Consideration against them is, that they are in general complicated, and not a little expensive.

N<sup>o</sup>. 21. Is an Instrument, calculated for the Purpose of marking out Drains with strait Edges, in order to save the Expence of that Part of the Work being done by a Spade and Line, which is attended with Delay; and the Machine is so constructed, that the Drain may be marked out from sixteen Inches to two Feet wide, at Discretion. Where large Quantities of this Kind of Work is to be done, the Machine will save considerable Expence; but where the Quantity of Work is but small, it will be an unnecessary Purchase.

N<sup>o</sup>. 22. Is the Scarificator mentioned before, when I was speaking of Mr. *Tull's* four-coultered Plough, to which it will be a very useful Substitute: and as to its other Purposes, I refer the Reader to what I have said of it, in my Report for the Year 1765, p. 41, &c.

N<sup>o</sup>. 23. Is an Instrument which I built upon the two preceding ones, in order to lessen the Expence to those who may have Occasion for them both, and which I have the Pleasure to observe, operates compleatly in either Case.

N<sup>o</sup>. 24. Is calculated for sinking Ditches by the Strength of Horses, after they are laid out, in order to save *Spade Work*; but after the Ditch shall be sunk, the Sides, it will be imagined, must be dressed by the Spade. This Plough has also been found very useful in sinking Potatoo Furrows, which saves the Labour of the second Spitting, and reduces the Soil at once to the Command of the Shovel. It has also been found useful

in

## The Description of the Uses of the

in deepening the Furrows, for the second covering of Corn by the Shovel.

N<sup>o</sup>. 27 to N<sup>o</sup>. 37, both inclusive, are Harrows of different Kinds; Instruments so universally known, that I need not say more of their Use, than just to observe, that the Harrow, in general Use in this Kingdom, is too often ineffectual in its Operation, by its being made only in *one* Frame; but by mine being made in two Frames, united together by what I call coupling Bolts, they lie close to the Ground, even in irregular Places, and therefore, I flatter myself, fulfil the Purpose of the Machine, namely, harrowing; whereas, the Harrow which is made with one Frame rides all rising Places in the field, and consequently passes over hollow Places very frequently. The triangular Plough-Harrow, N<sup>o</sup>. 32, is indeed an Exception to this Observation, because it consists of only one Frame; but then this Instrument is made in a particular Manner in the Pins, to *bite* the Ground, (if I may be allowed the Expression) because the Operation of it is diametrically opposite to that of the common Purpose of Harrows; for this Instrument acts like a Miner under the Surface, the others act above it. And, indeed, the very *Name* which I have given to this Instrument seems to indicate, that it is to act somewhat like a Plough, as well as an Harrow. This Instrument is wonderfully powerful in reducing Ground, clearing Weeds, Stubble, &c. and is really easier in its Draft, than would be imagined by looking at it.

N<sup>o</sup>. 38. Are Sledges and Truckles for various Purposes. I shall only just add, that I wish it were more generally the Practice, to introduce Sledges for removing our Ploughs and Harrows from Field to Field than it is; for by the too general Manner of removing them, they often receive more Injury than by a Month's Work; besides which, the Cattle are sometimes hurt.

N<sup>o</sup>. 39 to 49, both inclusive, are Waggons and Carts of different Kinds. Were I to enter into a general Description of their Construction, it would swell this Paper greatly beyond the Bulk of what I intended; and therefore I shall only beg Leave to inform the  
Reader,

Reader, that I have given very particular Attention to the Improvement of this Kind of Carriages; and I have the Pleasure to think, that the Demand I have for them, is as strong an Indication as I can have, that in the Judgment of others, I have not been unsuccessful in that Attempt.

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*Some Considerations upon the Construction of the Two Sorts of CARS in general Use, throughout this Kingdom; with a Description of One of a new Construction, No. 50. calculated to carry greater Burthens, and with much more Ease and Safety to that generous Creature, the Horse.*

**T**HE Advantage which is apprehended to be gained by the Lowness of the Wheels of common Cars, is said to arise, from the Weight of the Load, pressing them forward. And yet, I have generally observed, that the *greater* Weight of the Load, is put on *before* the Wheels, and that *entirely* in loading stones. Hence it should seem, that if the Weight of the Load, does at all contribute to the Motion of the Wheels, instead of its contributing to their Motion *forward*, it must on the contrary, press them *backwards*. And the *lower* the Horse, the *greater* will be *that Effect*. But to be mathematically full upon this Head, would require more Room, than the intended Bulk of these Considerations will admit of.

The Lowness of the Wheels of an Outside, and Inside Car.

The Gudgeons are in Contact with the Bolsters, which are always *Wood*, and therefore the Friction must be more laborious to Cattle, than when in Contact with Metal or Brass. Besides, the Bolsters are generally about four Inches broad, and therefore bear four Inches upon each Gudgeon, which must still cause a greater Resistance, by an *Increase* of Friction. Whereas a small Spok Wheel, when *properly bung*, will not have a Friction of more than an Inch and an half, and that will be lessened by its being Steel against Metal or Brass.

The Friction upon the Gudgeons of an Outside Car.

The inside Car is yet a more laborious Carriage to Cattle, because the Friction in that is between *Wood* and

Inside Cars, their Friction.

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and *Wood*, which is in Contact *eight* and *ten* Inches: The Axis is of Timber made round; and the Sides of the Car are laid upon that: To prevent the Axis wearing, in the Place of Friction; it is often stuck with Nails. I have lately seen a few Instances, where the Axis has been covered, in the Places of Friction; with Cast Mettle, which is an Amendment.

Wheels;  
how made,  
and how  
fixed upon  
the Axis.

Both the Carriages of this Kind, and which are the common ones of *Ireland*, have their Wheels made of Plank, commonly called *Block Wheels*. Through these Wheels pass the Axis, which is of Wood, and generally about four Inches *square*. The Wheels have a *square Mortice* made through them to receive the Axis upon which they are *firmly wedged*.

Consequen-  
ces.

The Consequence is, that the Axis must always turn *with* the Wheels: And one Wheel cannot turn *independent of the other*. Hence follows infinite Distress to Cattle.

For when the Carriage is to turn short, as soon as the Point on which the Horse presses at his Shoulder, forms an acute Angle with the Wheels, the Wheels *cease to turn*, for they immediately drag. The Horse is obliged to exert *all* the Power he has against this Resistance; which in *this* Operation is *Sideways*, and therefore he is deprived of at least half his Power, in the very Moment, in which he wants an Exertion of the greatest he has, to conquer the natural Obstruction of the Machine. But if Straw, stiff Dirt, or a Stone, meet the Wheel which *should go forward*, the Horse actually stops, and cannot move the Carriage; till the accidental Obstruction be removed.

And this Effect arises, in turning *either* of the Carriages named. The Body of the Carriage is frequently racked and broken, and the Horse often falls.

The Block Wheels in deep Roads, collect and carry with them great Quantities of Clay, which very soon come in Contact with the Car Sides and Inside Back, by which the Horse is infinitely distressed, and at last will be obliged to stop, unless an unmerciful  
and

and giddy Driver force him on, until he falls by Drawing. Careful Drivers are much interrupted in their Journies, by removing these Obstructions, which frequently require a good Deal of Labour.

In drawing Hay home, the Outside Cars are often stopped by a Collection of Hay between the Wheels, Sides, and Gudgeons, which take so much Time to remove, that I have often had Delay, Irregularity and Interruption ensue, in the drawing home Hay, and which the Farmer must often have experienced.

The Ends of the axis to an outside Car, come so nearly in contact with the Sides, that there is a continual Friction between them. In turning the Carriage, the Ends of the Axis immediately lock firmly against the Sides. All tending to the Distress of the Horse.

Another Cause of Friction.

#### *A short Description of the NEW CAR.*

Having thus shewn the Inconveniencies which attend the Construction of the common Cars, I shall now shew how far I have endeavoured to remove them, in the Construction of the Car, named in the following List, N<sup>o</sup>. 50.

The new Car.

I apprehended, a Carriage which adhered, as closely as might be, to those in common Use, would be most likely to make its Way into general Use.

Why the Form of the common Car was adhered to as much as could be, Friction, why less in this Carriage than a common Car.

First, as to the Objection made to the Friction in the common Cars, I have endeavoured to lessen that in this Carriage, by iron Arms, steeled; running in Metal Boxes, touching in each Wheel, only about an Inch and an Half.

The one being *Steel*, and the other *Metal*; both hard Bodies; it is apprehended the Friction must be considerably less than in a common Car; and consequently the Resistance lessened at equal Weights.

Brass Boxes would have been chosen, were it not, that it is apprehended they would be too dear for the lower people.

Why Brass Boxes were not chosen.

The

The Height  
of the  
Wheels.  
The Body  
raised. And  
why.

The Height of the Wheels exceed those of a common Car only about six Inches: But notwithstanding that, the Body of the Carriage is raised, by the Manner of hanging the Wheels, which will appear in the Machine. The Reason for which is, to bring the Shafts as near upon a strait Line as may be, to the Point of Draft in the Horses Shoulder; whereas, in the common Cars, the Points of the Shafts (commonly called the Sides) are so high, caused by the Lowness of the Wheels, that when the Draft is from the Points of the Shafts, the Shafts, and Point of Draft in the Shoulder of the Horse, form an obtuse Angle, by which the Horse is drawing upon his Back, greatly to his own Distress. To remove this Inconvenience, some have a Chain running as far back, under the Shaft from the Collar, as brings the Draft upon a direct Line. But this is liable to two capital Objections, particularly in the common Cars. Because in the Action of turning the Carriage, the Shaft from which the Beast draws, is a Lever to him, and by so much as he loses of its Length, in Proportion he is deprived of the Use of it, as a Lever. And every Man knows that the Ease of a Purchase, depends upon the Length of the Lever. The other Objection is, that when the Carriage inclines to fall backwards, which is too often the Case, the Horse cannot prevent it so effectually by his Draft's being so far back upon the Shafts, as he can when his Draft is from the Points, upon the same Principles, that his Lever is considerably shorter, than when he draws from the Points of the Shafts. But in this Case, the Purchase is perpendicular; whereas in the former it is horizontal.

Wheels turn  
independent  
of each  
other.  
And why  
Spok  
Wheels are  
chosen.

As to the Inconvenience, which attends the common Car Wheels not turning properly; in this I have *totally* removed it, by using Spok Wheels, which are to turn *upon* the Axis, *independent of each other*; but the Axis is not to turn, as in a common Car.

Further Reason why  
Spok  
Wheels are  
chosen.

Another Reason for choosing Spok Wheels is, that they are by no Means so liable to collect Clay or Dirt in



in their Passage, as the Block Wheels to a common Car, and therefore less liable to the Obstructions caused thereby; unless when they are improperly hung, which I am sorry to observe is too prevailing in this Kingdom, and even in *England*, as may be explained to such Persons as shall wish to understand it. As may also, the Manner of clouting a wooden Arm, or making an Iron one to most Advantage, which as much as possible, is kept a Secret in the wheeling Business; for there are many Men of that Trade, who can make a good Wheel, and yet know not how to bush and hang it. Upon which *totally* depends the easy Draft of a Carriage.

In common Practice, Wheels hung improperly.

And why?

To bush a Wheel in the best Manner, and most expeditiously should be done with an Engine, calculated for that Purpose only.

Best Manner of bushing a Wheel.

Block Wheels cannot be bushed properly, as Experience has often proved; for there are Gentlemen of Ingenuity in this Kingdom, who have seen the great Inconvenience attendant on the Operation of the common Car, and have attempted to remove it, by putting Boxes in Block Wheels, in order that they might turn independent of each other, upon Iron Arms; but it has been found, that great Difficulty attended the fixing the Boxes, because, if put really into the Plank, they cannot be wedged, it being impossible to drive the Wedges across the Grain of the Plank. To remove that Difficulty, a Piece of Timber has been lodged in the Centre of the Wheel, placing the Grain of the Block horizontally, and thereby the Boxes could be firmly fix'd in that Piece: But the Remedy was almost as bad as the Disease; for the Block, or Piece of Timber, which is so lodged in the Centre of the Wheel, soon became loose by Labour and Contraction, and consequently that Part of the Carriage must fall into a crazy Fabrick; abstracted from Labour being increased to the Horse, as soon as the Wheels, in their revolutions, form that offensive Sight, zigzag Lines, which is the unavoidable Consequence of being out of Square, be the Wheels what Kind they may.

Block Wheels can't be effectually bushed.

## The Description of the Uses of the

Manner of putting on Tire improved.

In the Article of putting on the Tire, I flatter myself some Amendment is also made, and which I now pursue in all the Carriages made in my Factory.

In the common Manner of putting Tire on Wheels, the Nails are apt to start, and the Heads break off, by either of which Accidents the Tire gets loose, and the Wheel is suddenly racked or shaken. To prevent this, I put every Strake on with Screw-bolts, which draws up the Tire, and keeps it to its Place, from which it never can start, till the Tire be worn out.

Roads how to be preserv'd by the Manner of making Tire-Nails.

The Manner of making the Heads of the Bolts, and punching the Tire, I apprehend, would be a great Preservation of our Roads, were it in general Use. And therefore seems to merit the Attention of the Legislature; for by the general Manner of making the Nails for Tire, the Law for the Establishment of broad Wheels is defeated.

Dirt and Grit, how prevented getting into the Boxes.

To prevent any Dirt or Grit getting in between the Boxes and Arms of the Carriage, Sand-pans are put upon the Ends of the Stocks, and Cuttoos over them, which will appear upon View. And which are put upon all the Carriages made in my Factory. The Iron Brackets which are mentioned, as being added to this Carriage, N<sup>o</sup>. 50. in the following List, are disposed in such Manner, as to fortify the Parts most liable to fail in a Car; the Shafts or Sides are plated with Iron from the Axis to the Tuck-pin Holes, and in every Part firmly affixed with Screw-bolts, which renders this Carriage a Machine of almost irresistible Strength and Permanence.

I might have been much fuller in my Description of this Car, but the Demand I have had for them is a stronger Proof, than any other I can give, of their superior Convenience, in every Kind of Business, in which a Car can be used; and therefore I shall only add, that one Horse has drawn, at one Load, upwards of 26 Hundred Weight upon one of them on a very rough road; and I am well persuaded, that the same Horse can draw upwards of 30 Hundred on the same Carriage, without any great Distress; and what seems

to be a pretty strong Fact is, that since I introduced these Cars, my People will not use the old ones, if they can seize these.

And it is allowed by competent judges, that they are compleatly calculated, not only for the Use of the Farmer, but for Sumpter Carriages on Circuits, military Baggage, Linen Cloth, Carriers, Millers, Timber, and Luggage of all Kinds; because severe Trials in the Use of them have shewn, that a Horse travels with Pleasure under a Load from 12 to 20 Hundred Weight upon one of them, when, on the same Journey, an Horse, under a common Car, with 6 and 7 Hundred upon him, has been suffering exceedingly by his distressing Draft, of which we have had many Instances, and very remarkable ones in bad Roads.

It must be confessed, that the Price is higher in the *first* Purchase than a common Car; but yet, when it is considered that this will last much longer, and that the same Horse which draws 5 Hundred on a common Car, will, with more Ease, draw 12 Hundred on this, Candour must admit it to be a much cheaper Carriage, for all the Purposes of Business and Profit. And all Men will allow, that no *perfect* Machine can be had at the Price of an *imperfect* one.

For the Convenience of such Persons as use Turf in their Houses, I have lately put a Cradle to this Carriage, to be put on and taken off occasionally, (see N<sup>o</sup>. 51.) by which it is said, by those who are acquainted with Turf, that as much may be drawn at one Load, as at three or four, in the common Manner.

N<sup>o</sup>. 52 to 78, both inclusive, contain a List of various Articles, which, from their Names, shew their Uses, altho' some of them are new; those which are improved in their Construction will shew for themselves.

N<sup>o</sup>. 79. Is an House and Boxes, calculated for the Preservation of Bees, by which large Quantities of Honey and Wax, it is said, may be taken, without murdering those laborious Insects. I have, in some of my former Papers, professed not to understand the Treat-

## The Description of the Uses of the

ment of Bees ; but from an Attention which the DUBLIN SOCIETY have lately given to their Preservation, I was animated into an Application towards the Management of them, and have received great Information in reading Mr. *Moses Rufden's* Treatise upon that Subject, and from whose Book I have built one of these Houses, &c. described, N<sup>o</sup>. 79. The Pleasure I have received, in seeing their Industry and Mechanism, which this Manner of keeping them admits of, I have conceived to be a full Recompence for the Expence of building their little Habitation, and the Success which the Method promises, induced me to give it a Place in my List. The Edition which I have of Mr. *Rufden's* further Discovery of Bees was printed in the Year 1679; whether it has gone through many Editions I know not, but I fear it is now out of Print, which being, I think such Gentlemen as are reputed Judges of this Management of Bees, would do the Public a Service, to recommend the re-printing this Book.

N<sup>o</sup>. 80. Is a neat and convenient Kind of Crib, for the more commodiously foddering black Cattle without Waste of their fodder, calculated more as a Pattern for Gentlemen and Farmers to build them by, than with any Expectation of selling them, they being too large to be carried to any great Distance, but may very conveniently be removed from Place to Place upon a Farm.

N<sup>o</sup>. 81. Is a Machine, calculated for the slicing Turneps for black Cattle with Expedition. An Instrument which I was induced to bend my Attention to the Construction of, from observing that the Society of Arts in London had offered a Premium for the Construction of such a Machine. In that which I have made for the Purpose, it is conceived by competent judges, that I have not been unsuccessful, because the Machine is fortified by great Strength, at the same Time that it has powerful Execution. The Simplicity of its Construction will render it intelligible to any Man, immediately upon a View of it. The Reasons why it is prudent to slice Turnips for Black Cattle, will be found in my Report for the Year 1764.

N<sup>o</sup>.

## INSTRUMENTS of HUSBANDRY.

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N<sup>o</sup>. 82, and N<sup>o</sup>. 83, are sufficiently described in their respective Places.

N<sup>o</sup>. 84 to 92. Are Geers and Traces of different Kinds, calculated for the Safety of Cattle, in their Work, in which, with the common Tackling they are often cut and hackt on their Sides and Backs.

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## A LIST of the INSTRUMENTS.

N<sup>o</sup>. 1. **T**HE DRILL PLOUGH, upon an improved Construction, with Brass Boxes, and compleatly mounted with Swingle-trees, Straps, Turnip-box, and Standards; and for sowing Wheat, Barley, Bere, Oats, Peas, Beans, Turnips, Sainfoin, Bur-net, Buck-wheat, &c. 8 Guineas. See p. 7.

N<sup>o</sup>. 2. The DRILL HARROWS, of a new Construction, rivetted and mounted with fifty-four Harrow-pins, hung to a Carriage with Chains, Hooks, Keys and screw-bolted Staples. The Carriage mounted with Iron-arms, affixed with Screw-bolts and screwed Staples, Spoke-wheels bound with Iron, a Pair of Shafts, double-twisted Back-band, Staples and Hook, Tuck-pins and Chains. 5 Guineas. See p. 7.

N<sup>o</sup>. 3. The HOE PLOUGH, compleatly mounted with double Bands, four Iron Wedges, Coulter, Bolts, Keys and Hook, Rider and Screw-bolt, the Mold-board, Land-side and Bottom, plated with Iron, Cross and Beam united by a thorough Screw-pin, a Steel Coulter and Iron Share. 40 Shillings. See p. 7.

N<sup>o</sup>. 4. The SINGLE CULTIVATOR, mounted in the same Manner, only that this Instrument has no Mold-board, but is made with a Chip which is plated with Iron. 1*l*. 14*s*. 1½. See p. 7.

B 3

N<sup>o</sup>.

## A LIST of the

N<sup>o</sup>. 5. The DOUBLE CULTIVATOR, mounted in the same Manner, but instead of a Share with one Fin, this has two, made of wrought Iron and steeled. 40 Shillings. See p. 7.

N. B. The Instruments, N<sup>o</sup>. 3, 4 and 5, are for Horse-hoing Drilled Crops, and to work them require a single Swingle Tree, and Swivel Chain, and therefore I shall enter it here as N<sup>o</sup>. 6. Where any Person shall chuse to have one for each of them, they will please to Order them.

N<sup>o</sup>. 6. The SINGLE SWINGLE-TREE and SWIVEL CHAIN. 5*s*. 5*d*. This Swingle-tree will answer for any other Plough, which is to be drawn by Cattle lengthways, which is always to be the Manner in in Horse-hoing Drilled Crops.

In my former List I named the Marking Plough, and Double Mold-board Hoe Plough, but I there mentioned them as not being absolutely necessary to the Drill Culture, and in the Continuation of my Practice I am confirmed in that Opinion, and therefore I shall not give them a Place in this List, the above Instruments being all that are necessary for the compleat Execution of the Drill Husbandry, except the Harness, and two Muzzles, which I describe for the Convenience of such Persons as have them not, or who cannot conveniently get them.

N<sup>o</sup>. 7. The HARNESS for the Drill Husbandry, consists of three Bridles, three Collars, two Pair of Collar Hames, one Pair of Draft Hames, one Cart Saddle and Crupper, two Pair of Traces and one Stretcher, two Back-bands, Belly-bands and Pads, two Pair of Trace Pipes and two Muzzles. Where the Ground shall be of so strong a Nature as to require more than two Horses for Hoing, Harness for a third will be necessary. For the Prices, see Number 83, &c.

N<sup>o</sup>. 8. The DRILL PLOUGH of a new Construction, for sowing Drilled Crops in the Flat Way at equal

equal distant Rows. 6 Guineas. *N. B.* I would not be understood to recommend this Instrument, because I conceive but an indifferent Opinion of the Husbandry. But as others may form another Opinion, I give a Place to the Instrument in my List. See p. 7. No. 8.

N<sup>o</sup>. 9. The BLOCK PLOUGH improved, for four Cattle to draw double, compleatly mounted with Beam-plates and Screw-bolts, Mold-board, Side and Bottom plated with Iron; the Beam and Cross united by a thorough Screw-pin, double Bands and Iron Wedges, Rider and Screw-bolt, a screw Staple, Hook and Washes, Collar, Bolts, Keys and Hook; a strong steeled Coulter and an Iron Share of a new Pattern. 2*l.* 10*s.* For its Use, See p. 7. No. 9.

N<sup>o</sup>. 10. The CHIP PLOUGH, mounted in the same Manner. 2*l.* 10*s.* See p. 7. No. 9.

N<sup>o</sup>. 11. The HUNTING PLOUGH with an Iron Chip, the Cattle to draw single, mounted in the same Manner. 2*l.* 10*s.* See p. 8, No. 11.

N<sup>o</sup>. 12. The BAITING PLOUGH, mounted in the same Manner, with a wrought Iron steeled Share. 2 Guineas and an half. See p. 8. No. 12.

N<sup>o</sup>. 13. The ESSEX PLOUGH, *i. e.* a Plough to work with two Cattle, both a-breast, and the Plowman to drive, mounted in the same Manner. 2 Guineas. See p. 8. No. 13.

N<sup>o</sup>. 14. The LOMAX PLOUGH, for four Cattle to draw double, mounted in the same Manner. 2*l.* 10*s.* See p. 9. No. 14.

N<sup>o</sup>. 15. The LOMAX PLOUGH for two Cattle to draw single, mounted in the same Manner. 2 Guineas. This is what I call my Seeding Plough. See p. 9. No. 15.

N<sup>o</sup>. 16. The GARDEN PLOUGH, mounted in the same Manner as N<sup>o</sup>. 3. 1*l.* 14*s.* 1*d.*<sup>½</sup>. This is a Plough

## A LIST of the

of the same Make, calculated for one Horse. See p. 10. No. 16.

N<sup>o</sup>. 17. The TURN-WRIST, or Kentish Plough, with or without Wheels. See p. 10. No. 17.

N<sup>o</sup>. 18. Mr. TULL'S Four Coultered Plough. See p. 10. No. 18.

N<sup>o</sup>. 19. The HERTFORD-SHIRE, or double Wheel Plough. See p. 10. No. 19.

N<sup>o</sup>. 20. The OXFORD-SHIRE, or single Wheel Plough. See p. 10. No. 19.

N<sup>o</sup>. 21. The DRAIN PLOUGH, to mark out Drains of different Diameters, mounted with a Spok-wheel bound with Iron, Iron Axis, double Wheels behind, plated Sliders, Swivels, Staple, Bolt Key and Lip; twelve strong Plates bedded in the Beams, Body Screw-bolts, Brackets and Screw-bolts, thorough Screw-bolts to hind Axis, two strong steeled Coulters and Iron Wedges, with Swingle-trees and Chain, mounted. 5 Guineas. See p. 11. No. 21.

N<sup>o</sup>. 22. The SCARIFICATOR with four Coulters, for taking Moss off Meadow Land, and otherwise improving it, mounted with a Spok-wheel bound with Iron, double Wheels behind, double Iron brackets, plated Sliders, swivel Staple, swingle-tree Brogues and Loops, five steeled Coulters, their Holes double plated and the Table-screw bolted. 4 Guineas. See p. 11. No. 22.

N<sup>o</sup>. 23. The SCARIFICATOR DRAIN PLOUGH, being a Scarificator and Drain Plough comprized in the same Instrument, mounted with Body-bolts, Brackets and Screw-bolts, a Spok-wheel bound with Iron, and an Iron Axis, two hind Wheels, thorough Screw Bolts and Brackets to the hind Axis, plated Sliders, swivel Staple, Bolt Key and Lip; twenty-two strong Plates bedded in the Beams; two strong steeled Coulters for marking



marking out Drains, and seven steeled Coulters for the Purpose of Scarifying Meadow Land; Wedges, Swingle-trees, Swivel Chain, Brogues, Loops, &c. 6 Guineas. See p. 11. No. 23.

N<sup>o</sup>. 24. **THE DITCHING PLOUGH.** This Instrument is mounted in the same Manner as N<sup>o</sup>. 4, with the Addition of Beam-plates, and is an Instrument of the same Kind, only that it is much stronger. 40s. See p. 11. No. 24.

*N. B.* This Instrument is to be worked with the Horses one before the other, and therefore requires a single Swingle-tree. No. 26, which is to be ordered, if required with it.

N<sup>o</sup>. 25. **SWINGLE-TREES** which are for drawing double, and a Swivel Chain, Brogues, Loops and Rivets. 12s. and without a Chain, 9s. a Set.

N<sup>o</sup>. 26. **SINGLE SWINGLE-TREES** and Swivel Chain, Brogues, Loops and Rivets. 5s. 5d.

N<sup>o</sup>. 27. **DOUBLE HARROWS** for *four Cattle*, of a new Construction, with the Pins steeled screwed and nutted; Washers, coupling Screw-bolts, and Nuts; screwed and nutted Staples and Hook. 5 Guineas. See p. 12. No. 27.

N<sup>o</sup>. 28. **DOUBLE HARROWS** for *two Cattle*, of a new Construction, mounted in the same Manner. 4 Guineas. See p. 12. No. 27.

N<sup>o</sup>. 29. **SWINGLE-TREES** for *two hind Cattle* of N<sup>o</sup>. 27 and N<sup>o</sup>. 28, mounted with strong-eyed Bands, Brogues, Loops, Hooks and Chains. 16s. 3d.

N<sup>o</sup>. 30. **A LARGE HARROW** upon Wheels, a new Instrument. See p. 12. No. 27.

N<sup>o</sup>. 31. **HARROWS** for *two, and four Horses*, with Chains, and affixed to a Carriage with a Pair of Wheels and Shafts. See p. 12. No. 27.

## A LIST of the

N<sup>o</sup>. 32. The TRIANGULAR PLOUGH-HARROW, for the reducing Ground; strong Bulls, Iron-slats affixed with Screw-bolts, Anchor-pins, steeled, nitted and screwed; Collar-bolts, Keys and Hook. 5 Guineas. See p. 12. No. 27.

N<sup>o</sup>. 33. DOUBLE HARROWS for four Horses, eight Bulls mounted with square Pins, coupling Screw-bolts and Nuts, screwed Staple and Hook. 3 Guineas. See p. 12. No. 27.

N<sup>o</sup>. 34. DOUBLE HARROWS for two Horses, mounted in the same Manner. 3*l*. See p. 12. No. 27.

N<sup>o</sup>. 35. The TRIANGULAR PLOUGH HARROW for one or two Horses, chiefly for Peas.

N<sup>o</sup>. 36. GARDEN HAND HARROWS:

N<sup>o</sup>. 37. FLAX HARROWS.

N<sup>o</sup>. 38. SLEDGES and TRUCKLES of every Construction, for Ploughs, Harrows, Bushes, Timber, Sacks of Corn, Lead, &c. See p. 12. No. 38.

N<sup>o</sup>. 39. WAGGONS with either broad or narrow Wheels, finished in the compleatest Manner. See p. 12. No. 39.

N<sup>o</sup>. 40. CARTS with three Wheels three Inches broad, for one or two Horses; with a framed Bottom, Compass Shaft Slats and Screw Bolts, and compleately mounted with strong Stock-bands, Sand-pans, Buttons and Pins; Cuttoos affixed with Screw-bolts, strong counter-sunk Hinges and Screw-bolts, and strong Shaft-straps; strong Iron Standards screwed and nitted; Iron Tail-pins and Chains; Iron Tail-board Lips and Bolts; Tuck-pins, Chains and Staples, double-twisted swivel Back-band, Staples and Hook; a strong Iron-sword Screw-bolt and Staple; strong Hurters, Iron Trap-bolt Staples and Screw-shaft Staples, strong and full sized Tire on the Wheels, countersunk and

put

put on with Screw-bolts; Fore-carriage mounted with strong treble Iron-bows, Screw-bolts, Centre-pin and Keys, Gudgeons, Gudgeon-hurters and Gudgeon-brackets, affixed with Screw-bolts and strong Shaft-bolt, &c. 11 Guineas. See p. 12. No. 39.

No. 41. The same CARRIAGE mounted with Iron Arms affixed with Screw-bolts and Screw-staples. 12 Guineas. See p. 12. No. 39.

No. 42. The same CARRIAGE with six-inch Wheels, Wooden Axle-tree. 13 Guineas. With Iron Arms, 14 Guineas. See p. 12. No. 39.

No. 43. The same CARRIAGE with nine-inch Wheels, Wooden Axle-tree. 15 Guineas. With Iron Arms, 16 Guineas. *N. B.* Where the Tire for these Wheels shall be chosen of thin Iron for Lawns, the Price will be less in Proportion to the Quantity of Iron abated. See p. 12. No. 39.

No. 44. TWO-HORSE CARTS with a framed Bottom, Compass Shaft-slats and Screw-bolts, and completely mounted with strong Stock-bands, Sand-pans, Buttons and Pins; Cuttoos affixed with Screw-bolts, strong Hurters, strong counter-sunk Hinges and Screw-bolts; strong Shaft-straps, strong Iron Standards, nutted and screwed; Iron Tail-pins and Chains; Iron Tail-board, Lips and Bolts, Tuck-pins, Chains and Staples; double-twisted swivled Back-bands, Staples and Hook; a strong Iron-sword Screw-bolt and Staple; Iron Trap-bolt, Staples and Screw-shaft Staples; strong and full sized Tire on the Wheels, counterfunk and put on with Screw-bolts, &c. 12 Guineas. And mounted with Iron Arms, 13 Guineas. See p. 12. No. 39.

No. 45. ONE-HORSE CARTS, mounted in the same Manner as No. 44, with wooden Axle-Trees, 7 Guineas. With Iron Arms, 8 Guineas. See p. 12. No. 39.

No. 46. The FARMER'S CART for one Horse, mounted in the same Manner as No. 44, and with Iron Arms.

## A LIST of the

Arms, and the Addition of Top-railing, calculated for drawing Hay, Straw, Corn in Sheaf or Sacks, Dung, Earth, &c. 7 Guineas. See p. 12. No. 39.

No. 47. BOMB CARTS of any Size.

No. 48. SMALL CARTS, of a new Construction, for Lawns or Grass Walks, which will not cut the Sod.

No. 49. WATER-CARTS of any Construction, either to fill themselves, or to be filled by Hand or Pump.

No. 50. LOW-BACKED CARS of a new Construction, mounted with Spoke Wheels, and bound with Counter-sunk Tire put on with Screw-bolts, Iron Arms put on with Screw-bolts, Wing-brackets and Screw-bolts, Tuck-pins and Chains, double-twisted swiveled Back-band, Hook and Staples, 5 Guineas. When a double Centre Bracket, moulded Brackets behind, Shaft Brackets, and Shaft Lining, all firmly affixed with Screw-bolts, a Drag-staff hung on a Swivel, Screw Staple and suspending Chain, Cuttoos, Sand-Pans, Buttons and Pins, Tuck-Pins and Chains are added, then the Price is 6 Guineas. See p. 13 to 19. No. 50.

No. 51. A TURF CRADLE, for drawing Turf, suited to the Cars, to be put on and taken off occasionally, one Guinea. See p. 19.

No. 52. COACH, POST-CHAISE, CABRIOLE, and other WHEELS.

No. 53. WHEEL-BARROWS of a neat and strong Kind, from half a Guinea to 4 Guineas apiece.

No. 54. WHEEL-BARROWS for Gardens, with Broad-Wheels for the Preservation of the Walks, 1 Guinea.

No. 55. WATER-BARROWS, for Gardens, with a Pair of Wheels of a new and compleat Kind.

No. 56.

No. 56. WEED-BARROWS for Gardens. 13*s*.

No. 57. GRASS-BARROWS for Soiling Plough Cattle when standing yoaked in the Field. 13*s*.

No. 58. SHEEP-RACKS, of a compleat and new Construction, with Bevel Racks.

No. 59. SHEEP-RACKS of a compleat and new Construction, with Perpendicular Racks.

No. 60. FIELD-GATES of any Construction.

No. 61. GARDEN-SEATS, CHAIRS, and STOOLS, of various Kinds.

No. 62. ROLLERS for Corn and Meadow, of a compleat and new Construction.

No. 63. SPIKED-ROLLERS of any Construction.

No. 64. A ROLLER for reducing Fallows, be they ever so stubborn.

No. 65. FANNERS for Winnowing Corn in the Barn. 3 Guineas and half.

No. 66. BRASS-WIRE-SIEVES for Corn and Seeds.

No. 67. HAY-RAKES, of a strong and neat Kind, 19*s*. 6*d*. per Dozen.

No. 68. IRON RAKES of various Kinds.

No. 69. HAY-FORKS, Handles, Ferrils, and Rivets neatly mounted, 2*s*. 8*d* $\frac{1}{2}$ .

No. 70. HAY-PITCHING FORKS, with long Handles, Ferrils, Head, and Rivets, 3*s*. 9*d* $\frac{1}{2}$ .

No. 71. THREE-PRONGED FORKS for Dung, compleatly mounted. 5*s*. 5*d*.

No. 72:

## A LIST of the

No. 72. **THREE-PRONGED FORKS**, for raising Stones and Rubbish out of Gardens. 5*s.* 5*d.*

No. 73. **DRAG-FORKS**, for unloading Dung in small Heaps on Land. 3*s.* 3*d.*

No. 74. **Dock-Irons**, for pulling up the Roots, 7*s.* 6*d.*

No. 75. The **BRIER-DOG**, with polished Cheeks, screw-bolted Arm, Block double-hooped, and double-banded Lever, for pulling up Thorns, &c. by the Roots. 1*l.* 14*s.* 1½.

No. 76. The **STUMPING-IRON**, for compleatly taking the Beards of Barley with Expedition, 13*s.*

No. 77. **ENGINES** for cutting Hay and Straw for Horse-Meat.

No. 78. **VENTILATORS** for Hay-Ricks, by which the Hay may be saved without putting it in Tramp-Cocks.

No. 79. **BEE-HOUSES** and **BOXES**, for taking the Honey and Wax without killing the Bees, consisting of an Houfe, and six Octagon Boxes, for two Colonies, 7 Guineas. See p. 20. No. 79.

No. 80. **CRIBS** of a neat and new Construction for foddering Black Cattle. See p. 20. No. 80.

No. 81. The **TURNEP SLICING ENGINE**, a new Instrument for slicing Turneps for Black Cattle, consisting of a large framed Chest, a Cylinder with Iron Axis and Winch, 30 strong Iron Arms, and nine large strong steeled Knives affixed with Screw-bolts, 7 Guineas. See p. 20. No. 81.

No. 82. The **STUBBLE HORSE-RAKER**, calculated for pulling up and gathering Stubble at one Operation, where the Corn shall have been sown flat, either under the Harrow or Plough.

No. 83.

INSTRUMENTS of HUSBANDRY.

31

No. 83. The BROAD-CAST TURNIP HORSE-HOE, an Instrument for thinning and Horse-hoeing Broad-cast Turneps.

GEARS and TRACES for HORSES and BULLOCKS.

No. 84. TRACES of different Kinds from 8s. 8d. to 11s. 4d.  $\frac{1}{2}$  a Pair.

No. 85. LONG PLOUGH CHAINS, short Links, 9s. 9d. Short Plough Chains, 3s. 9d.  $\frac{1}{2}$

No. 86. HORSE-HAMES, of strong compleat Kinds, for Ploughs and Carriages, from 6s. 6d. to 8s. 1d.  $\frac{1}{2}$  a Pair.

No. 87. SUSPENDING-CHAINS for Ploughs, 3s. 6d. per Pair.

No. 88. HORSE-COLLARS, from 3s. 3d. to 7s. 6d. a Piece.

No. 89. BRIDLES with Winkers, strong, home-made, polished Bits, 6s. When letter'd, each Letter 4d.

No. 90. PLOUGH-SADDLES, stuffed with curled Hair, Girth, Belly-band, Crupper, Hip-Straps, broad double-buckled Back-band, black Leather, Mortice-blocks, 17s. 6d.

No. 91. BACK-BAND, double Buckles, Pad and Belly-band, broad black Leather, 6s. 6d.

No. 92. TRACE-PIPES of Leather, 3s. 6d. a Pair.

No. 93. MUZZLES for Horses, 4s. 4d. a Piece. These are necessary in the Horse-hoeing drilled Crops, to prevent the Cattle eating the Crop.

No. 94. A LARGE STRONG PLOUGH, mounted in the same Manner as No. 9, and of the same Make, calculated for ploughing from 12 to 18 Inches deep,  
and

and to be drawn by any Number of Cattle, from 8 to 16. 3 Guineas.

*The Nature of this Undertaking is attended with such a constant Demand for ready Money, that I hope, whoever may favour me with their Commands, will not expect any C-redit, as the Nature of the Undertaking will not admit of it.*

It is requested of every Person, who may send any Orders by Letter, that they will please to add the Number which is annexed to the Articles in the preceding List to such Instruments as they may please to order, which will effectually prevent any Mistakes. And also, to specify whether they would have any Extra Coulters or Socks to such Ploughs as may be ordered; the latter will always be necessary, when the Ploughs are to go to any great Distance, because no other Socks will fit my Ploughs but my own Pattern; the Reasons for which, see Page 23, in my Explanation of the BLOCK PLOUGH, No. 9.

N. B. It has for some Time past been made a Practice to invite my Artificers to do what is called little Jobs for other Persons, inconsiderately, I am willing to hope; because a Moment's Reflection would convince any Gentleman, that nothing can be more intricate and unreasonable, not to use a severer Term, than privately, and to the Interruption of my Business, to call away Men whom I have imported, collected and instructed at a great Expence, whom I constantly maintain together with their Families, and who are to return to me, when the Purposes of the Persons so inviting them are served. Some recent Instances of this Kind, added to many preceding ones, obliges me to mention it thus publickly, which I hope will so effectually prevent a repetition of it, as to render it unnecessary for me to take any further Notice of it.

T H E E N D.



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I N D E X.

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