No. 680,248. Patented Aug. 13, 1901.

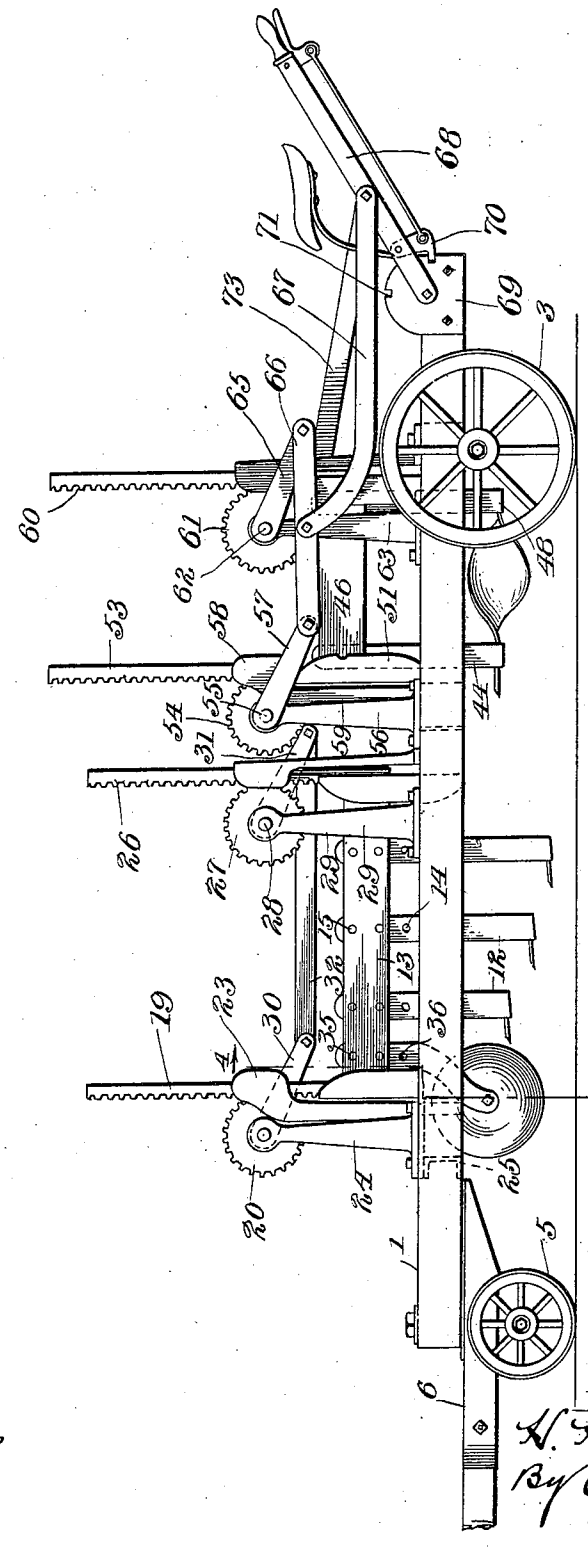
H. HAUSSMANN.

PLOW.

(Application filed June 11, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1



Witnesses
Ira D. Perry
S. B. Weir

Inventor
H. Haussmann
By Elliott Hopkins
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 680,248. Patented Aug. 13, 1901.

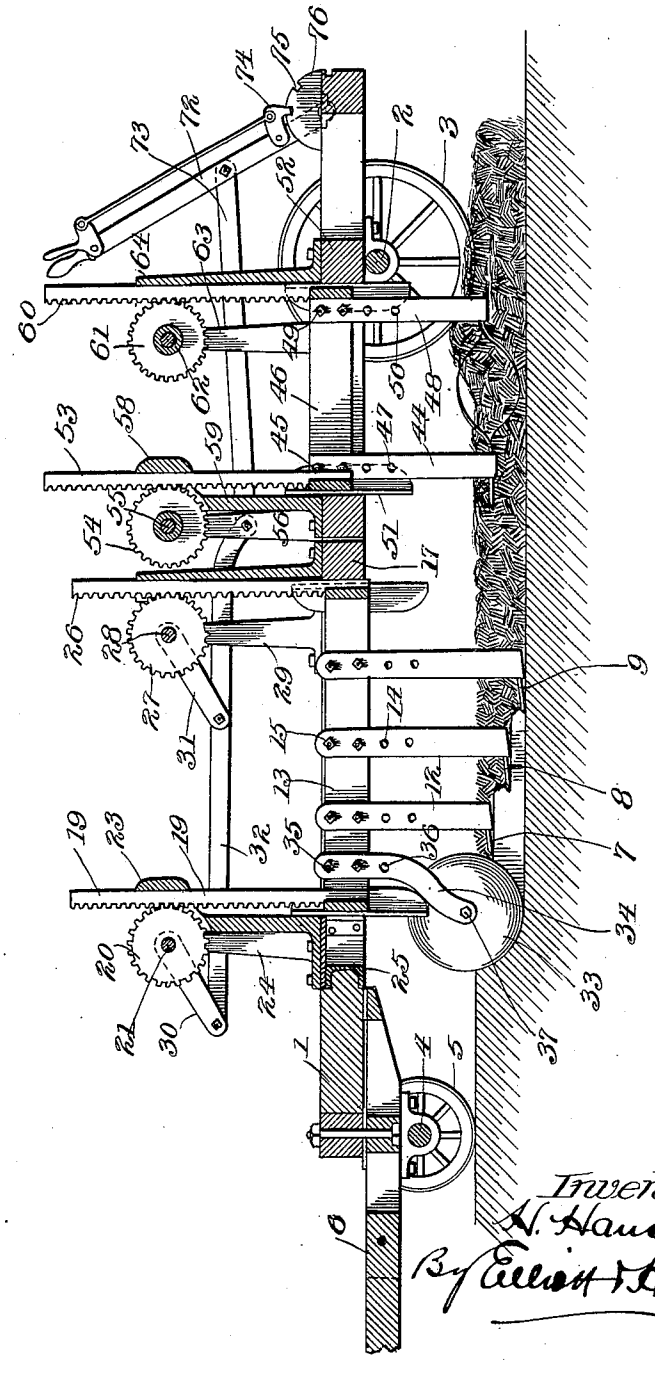
H. HAUSSMANN.

PLOW.

(Application filed June 11, 1900.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



Witnesses
Jno. D. Berry.
J. B. Weir.

Inventor
H. Haussmann
By Elliott & Hopkins
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 680,248. Patented Aug. 13, 1901.

H. HAUSSMANN.

PLOW.

(Application filed June 11, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 3

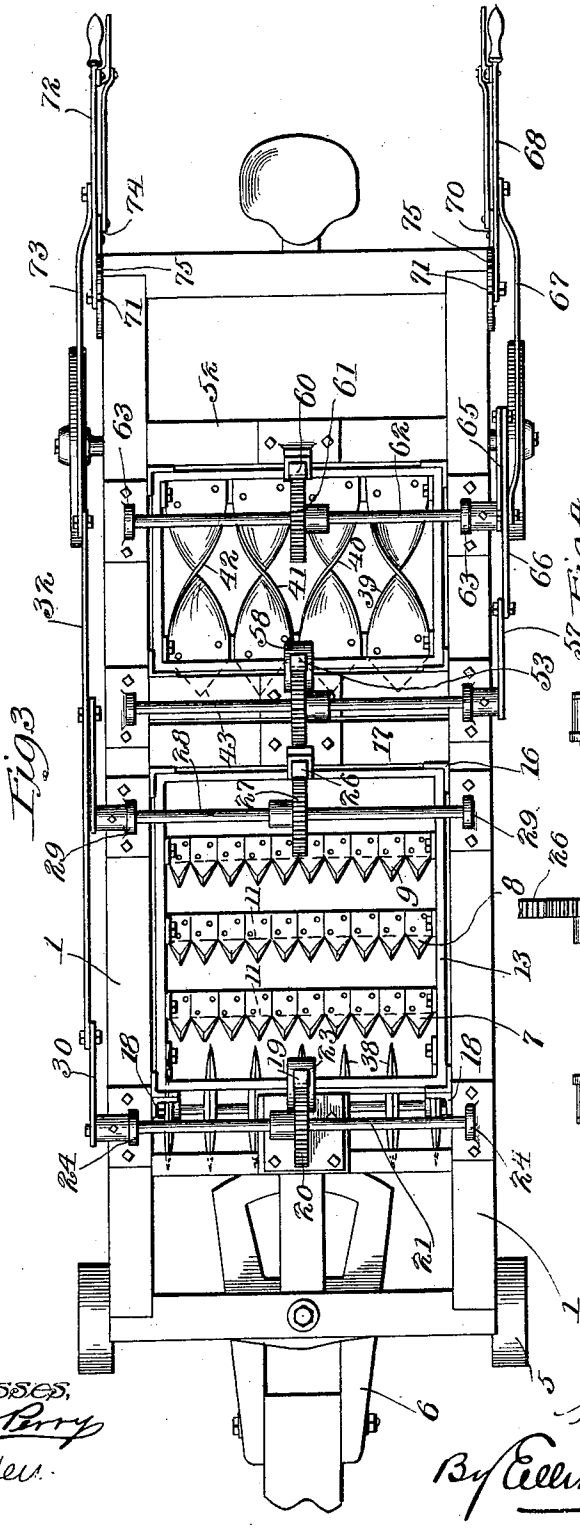
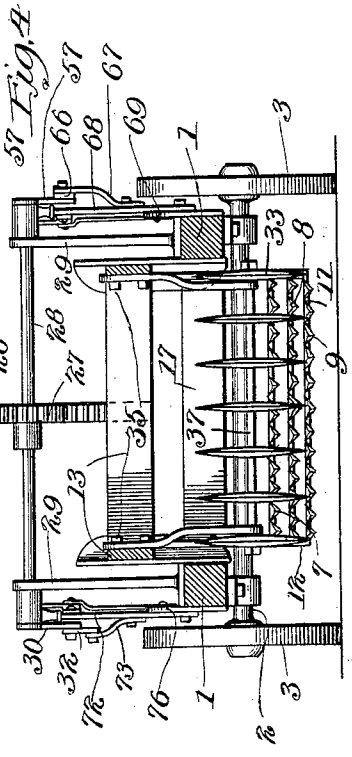


Fig. 4



Witnesses,
Ira D. Perry
J. B. Wes.

Inventor
H. Haussmann
By Ellis & Hopkins
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HERMANN HAUSSMANN, OF CHICAGO, ILLINOIS.

PLOW.

SPECIFICATION forming part of Letters Patent No. 680,248, dated August 13, 1901.

Application filed June 11, 1900. Serial No. 19,797. (No model.)

To all whom it may concern:

Be it known that I, HERMANN HAUSSMANN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Plows, of which the following is a full, clear, and exact specification.

My invention relates to that class of implements for tilling the soil more generally known as "plows;" and it has for its primary object to provide means for turning up the soil without necessarily shifting the field—that is to say, without throwing the soil to one side of the furrow, as is the case with the ordinary plow.

A further object of my invention is to lighten up the soil into a number of strata and subsequently invert these strata, causing the superstratum to change places with the substratum without necessarily throwing the substratum to one side of the furrow, as is the case with the ordinary plow.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of my improved plow. Fig. 2 is a vertical longitudinal sectional view thereof. Fig. 3 is a plan view; and Fig. 4 is a transverse sectional view taken on the line 4 4, Figs. 1 and 3.

1 represents a rectangular frame supported at one end upon a rear axle 2 and ground-wheels 3 and at the other end upon a pivoted axle 4 and wheels 5, a tongue 6 being attached to the forward axle for the attachment of draft-animals.

Supported at the forward end of the frame 1 is a series of horizontally-arranged cutters 7 8 9. These cutters, preferably three in number, are arranged in different planes increasing in depth from front to rear and they are adapted to form the soil into three different strata. These cutters may be held and supported in any suitable manner. I have shown each cutter composed of a series of flat teeth 10, (better shown in Fig. 3,) which are secured to the horizontal portion 11 of a U-shaped frame, whose arms 12 are secured in any suitable manner to a vertically-adjustable frame 13, said frame 13 being preferably common to all of the cutters 7 8 9, so that their depth of cut may be varied simultaneously or one or more of them raised entirely out of the ground when it is not desired to use them. I have also shown the vertical arms 12 of the cutter-frames each provided with a series of perforations 14, whereby they may be secured to the frame 13 at various elevations by means of bolts 15 or other suitable devices.

The frame 13 is provided at each corner with a vertically-arranged angle-iron 16, which constitutes a guide for confining the frame 13 to its vertical movement, these guides 16 fitting at one end into the corners formed by the said members of the frame 1 and a cross-beam 17, while at the other end fitting in corners formed by said side members of the frame 1 and brackets 18, secured to said side members. The frame 13 at one end is supported by means of a vertical rack-bar 19 engaging with a pinion or toothed segment 20, mounted upon a transverse shaft 21, journaled in standards 22, which are supported on the main frame 1, the rack 19 being held in place and guided by a guide 23, secured to a standard 24, which is supported by a cross-beam 25, the standard 24 being also recessed for the reception of the pinion 20. The frame 13 at the other end is supported by a rack-bar 26, which engages with a pinion or toothed segment 27, secured to a shaft 28, which is journaled in standards 29 on the main frame 1, and these shafts 21 28 are provided with crank-arms 30 31, respectively, which are connected together by connecting-rod 32, whereby the two crank-arms may be simultaneously oscillated and the frame 13 uniformly raised or lowered at both ends.

The arms 12 are made of comparatively thin bars, so as to offer but little resistance to the earth; but in order to insure against any material resistance on the part of the arms 12 and to provide for cutting out a strip

equal to the width of the frame 13 I arrange a cutter 33 in line with the arms 12, which latter, of course, are preferably arranged one behind the other, one of these cutters 33 being located on each side of the machine and preferably composed of a disk journaled at the lower end of a supporting-arm 34, secured by bolts 35, passing through perforations 36 to the side members of the frame 13. It is also desirable in some instances that the ground in front of the cutters 7 8 9 be cut into narrow strips preparatory to being stratified by the cutters 7 8 9, thus providing against the possibility of very large sods and clots held together by roots and sticks clogging the after mechanism, presently described, and being left on the field in large masses. To this end, therefore, I connect the arms 34 by means of a shaft 37, and at short intervals on the latter I arrange additional disk cutters 38.

Located in the rear of the stratifying-cutters 7 8 9 are a number of inverting-blades 39 40 41 42, composed of thin or comparatively thin strips, to which has been imparted a half turn or twist. These inverting-blades are arranged in a horizontal position, with their flat forward ends preferably in the same horizontal plane and each provided with a point 43, which is preferably detachable, so that the same may be renewed in the case of breakage or wear. The forward ends of the inverting-blades are secured to the horizontal bar of a U-shaped frame, whose vertical arms 44 are attached by bolts 45 or other suitable devices to the side members of a vertically-adjustable frame 46, the arms 44 being provided with a series of perforations 47, whereby the height of the blades may be varied with relation to the frame 46. The rear ends of these inverting-blades are secured in any suitable manner to the horizontal bar of a similar U-shaped frame, whose vertical arms 48 are attached by bolts 49 or other suitable devices to the side members of the frame 46, the arms 48 having a series of perforations 50, whereby the rear ends of the blades may be raised or lowered with relation to the frame 46. These inverting-blades are located in substantially a horizontal position and arranged in pairs, so that the blades of each pair will tend to throw the earth toward one another—that is to say, the blade 39 is so twisted with relation to the twist of the blade 40 that the earth caught on the points of these two will be inverted by the twist and thrown down again at a point between the two, while the blades 41 42 have a similar twist and action with relation to each other, and it will also be seen that the earth carried up by the twist of one blade of each pair will be thrown over and inverted along a line directly under the other blade of that pair, thus causing the earth inverted by one blade to exchange places in a greater or less degree with that inverted by the other blade of the same pair, and by this method it will be seen I turn up the subsoil without shifting the field or, in other words, without throwing the soil to one side of the furrow, as is the case with the ordinary plow. In the operation of the device the points 43 are set in substantially a horizontal position in a plane between the upper and lower stratifying-cutters 7 8 9, so that as the earth is stratified by the latter the points 43 will receive on their upper surfaces one or more of the strata thus formed, and the earth thus lightened up and divided into narrow strips by the cutters 33 38 will be received by the twisted surfaces of the inverting-blades 39 40, &c., and turned completely over and cast down between the inverting-blades, the earth thus inverted by one blade being thrown into the furrow or channel formed by the under side of the other blade dragging in the earth.

The frame 46 is provided at each corner with an angle-iron 51, engaging in the corners formed by the side members of the frame 1 and cross bars or beams 52 53 to form guides for preventing the frame 46 from binding, and the frame 46 is supported at one end by a rack-bar 53, which engages with a pinion 54 on shaft 55, journaled in standards 56 and having a crank-arm 57, the rack-bar 53 being guided by a guide 58, formed on a standard 59, into which the pinion 54 is recessed, and the other end of the frame 46 is supported by a similar rack-bar 60 engaging with a pinion 61, secured to a transverse shaft 62, journaled in standard 63, the rack-bar 60 being held in engagement with the pinion 61 and guided by a standard 64. The shaft 62 is provided with a crank-arm 65, connected to the crank-arm 57 by connecting-rod 66, which in turn is connected by connecting-rod 67 to an operating-lever 68, pivoted to segment-plate 69 on the main frame and having a dog 70, adapted to engage in the notches 71 of the segment-plate 69 for locking the lever 68 in the desired position. By this means it will be seen that the frame 46, carrying the inverting-blades, may be adjusted to the desired elevation with relation to the stratifying-cutters 7 8 9 or lifted entirely clear of the ground when transporting the machine from place to place or when it should be desired to use the stratifying-cutters alone.

The connecting-rod 32 is connected to an operating-lever 72 by connecting-rod 73, so that the stratifying-cutters 7 8 9 may be raised or lowered independently of the inverting-blades. The lever 72 is provided with locking-dog 74, adapted to engage in the notches 75 of segment-plate 76 on the main frame.

It is obvious that the number of inverting-blades and the length of the series of stratifying-cutters may be varied at will without departing from the spirit of my invention, and also that the number of stratifying-cutters may be diminished or increased without materially affecting the result, and it will fur-

thermore be understood that while I have been particular to describe in detail the construction shown in the drawings such details are unimportant and may be substituted by other means for holding and guiding the stratifying-cutters and inverting-blades.

From the foregoing description it will be seen that each one of the twisted inverting-blades performs a useful function apart from any coöperative relation to the others in that it catches upon its forward end a certain amount of the earth and turns it completely upside down, after the fashion of a screw, such twisted inverting-blade acting on one of its sides to take the earth from the bottom and transfer it to the top on the opposite side of the blade and acting on its other side to take the earth from the top and throw it to the bottom. Hence while two of such twisted inverting-blades produce a much more desirable and efficient result than is possible with a single one of them my invention in its broadest aspect is not limited to a plurality or pair of them.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In an implement for the purpose described the combination of a horizontally-arranged cutter extending transversely of the line of travel of the implement for stratifying the earth and an earth-inverter following in the path of said cutter and consisting of a flat blade twisted substantially a half-turn with its forward end arranged in substantially a horizontal plane, substantially as set forth.

2. In an implement for the purpose described the combination of a horizontally-arranged cutter extending transversely of the line of travel of the implement and a plurality of twisted inverting-blades arranged in the path of and following said cutter, substantially as set forth.

3. In an implement for the purpose described the combination of a plurality of horizontally-arranged cutters extending transversely of the line of travel of the implement and arranged in different horizontal planes and an inverting-blade arranged to follow said cutters for inverting the stratum formed thereby, substantially as set forth.

4. In an implement for the purpose described the combination of a horizontally-arranged stratifying-cutter extending transversely of the line of travel of the implement, a series of vertically-arranged cutters located in front of said stratifying-cutter and across its line of travel and means arranged in the rear of said stratifying-cutter for inverting the stratum formed thereby, substantially as set forth.

5. In an implement for the purpose described the combination of a vertically-adjustable frame, a carrying-frame upon which said adjustable frame is supported, a stratifying-cutter arranged in a horizontal plane and supported from said adjustable frame and means arranged in the rear of said stratifying-cutter for inverting the stratum formed thereby, substantially as set forth.

6. In an implement for the purpose described the combination of a vertically-adjustable frame, a carrying-frame to which said adjustable frame is secured, a plurality of horizontally-arranged stratifying-cutters supported at different elevations from said adjustable frame and means arranged in the rear of said stratifying-cutters for plowing the stratum formed thereby, substantially as set forth.

7. In an implement for the purpose described the combination of a pair of horizontally-arranged twisted inverting-blades each having its twist turned to throw the earth toward the other and means for forcing said blades horizontally through the earth, substantially as set forth.

8. In an implement for the purpose described the combination of a pair of twisted inverting-blades having their forward ends arranged in substantially a horizontal plane, means arranged in advance of said twisting blades for lightening up the earth and means for carrying said means and blades, substantially as set forth.

9. In an implement for the purpose described the combination of a pair of twisted inverting-blades having their forward ends pointed and arranged in substantially a horizontal plane and means for forcing said blades through the earth, substantially as set forth.

10. In an implement for the purpose described the combination of a pair of twisted inverting-blades, a vertically-adjustable frame upon which said blades are horizontally supported and a vehicle-frame upon which said first frame is adjustably carried, substantially as set forth.

11. In an implement for the purpose described the combination of a stratifying-cutter, a vertically-adjustable frame carrying said cutter, inverting-blades arranged in the rear of said cutter for inverting the stratum formed thereby and a frame carrying said inverting-blades and being vertically adjustable independently of said first frame, substantially as set forth.

12. In an implement for the purpose described the combination of an inverting-blade consisting of a twisted plate having its ends arranged in substantially a horizontal plane and two frames upon which the ends of said blade are respectively supported and means for carrying said frames and forcing said blade through the earth, substantially as set forth.

13. In an implement for the purpose described the combination of a carrying-frame, an adjustable frame on the forward end thereof, a series of vertical cutters supported

from said adjustable frame and arranged transversely of the line of movement of said carrying-frame, a series of stratifying-cutters arranged transversely of the line of movement of said carrying-frame and in different horizontal planes and supported from said adjustable frame, a series of inverting-blades arranged at the rear of said stratifying-cutters and adapted to invert the stratum formed thereby, an adjustable frame to which said inverting-blades are secured and means for raising and lowering said adjustable frames, substantially as set forth.

HERMANN HAUSSMANN.

Witnesses:
F. A. HOPKINS,
EDNA B. JOHNSON.