

No. 707,878.

Patented Aug. 26, 1902.

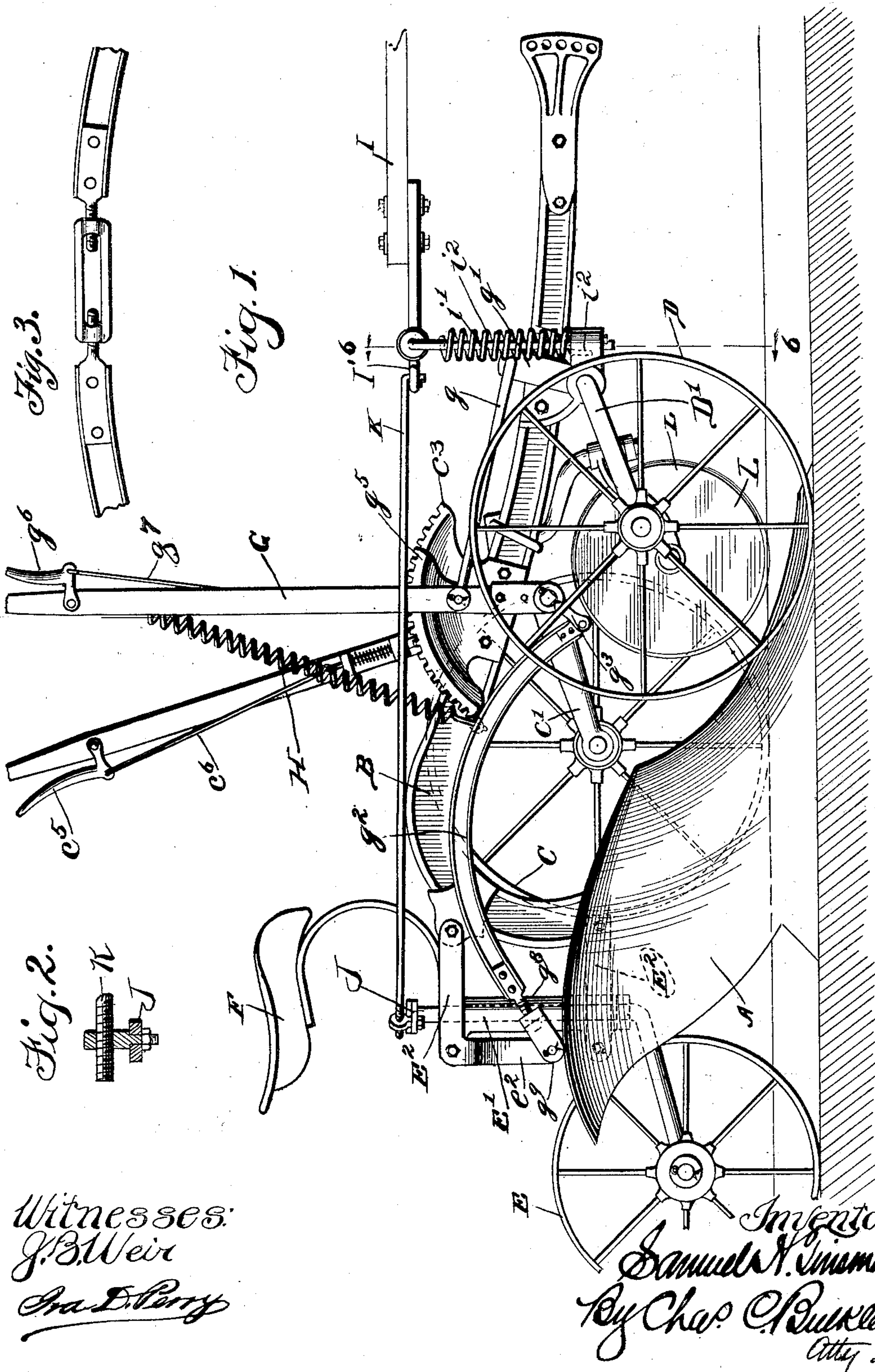
S. H. TINSMAN.

PLOW.

(Application filed Oct. 23, 1901.)

(No Model.)

5 Sheets—Sheet 1.



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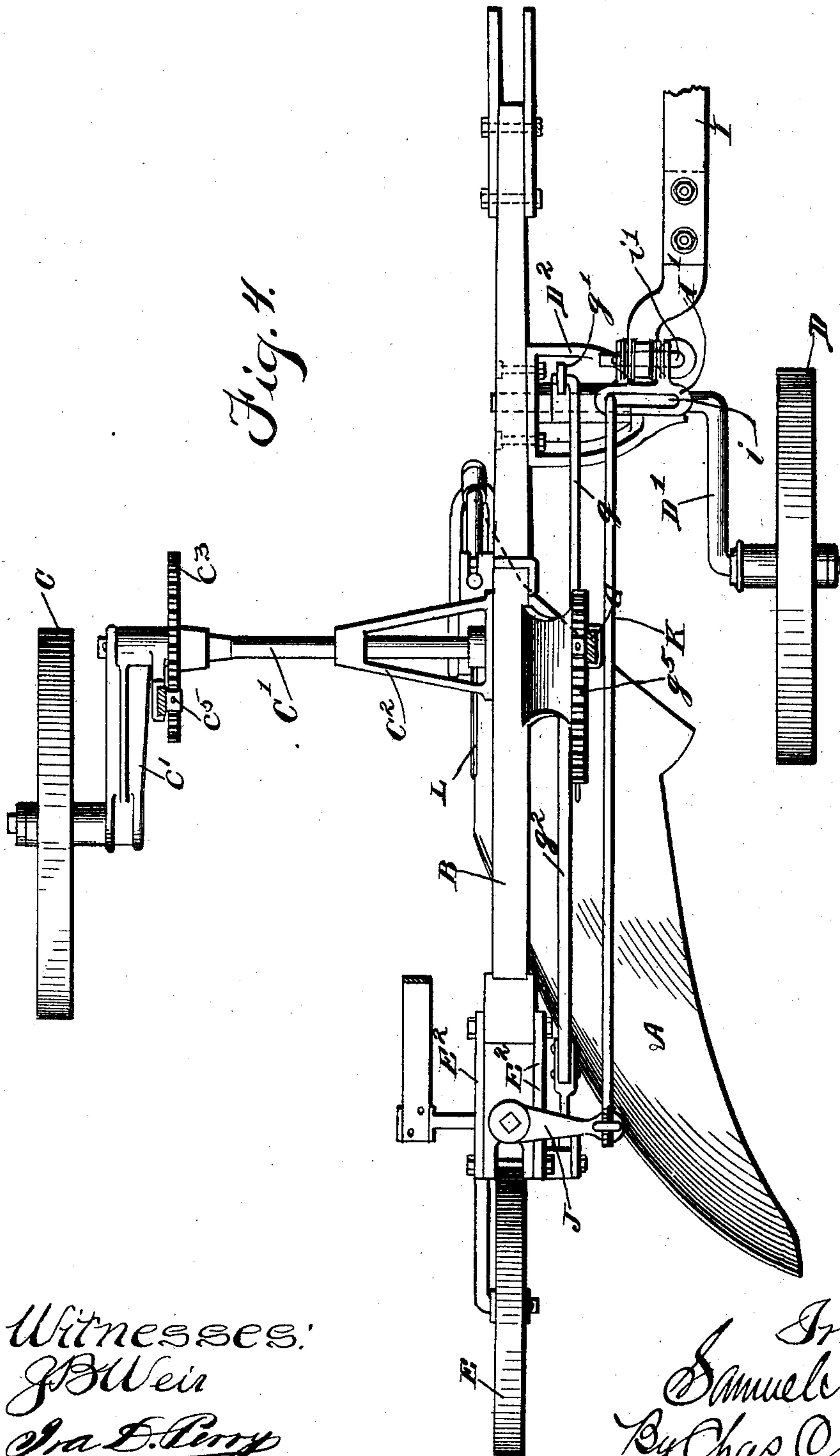
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(No Model.)

5 Sheets—Sheet 2.



Witnesses:
J. B. Weir
J. A. D. Perry

Inventor:
Samuel H. Tinsman
By Chas. C. Buckley,
att.

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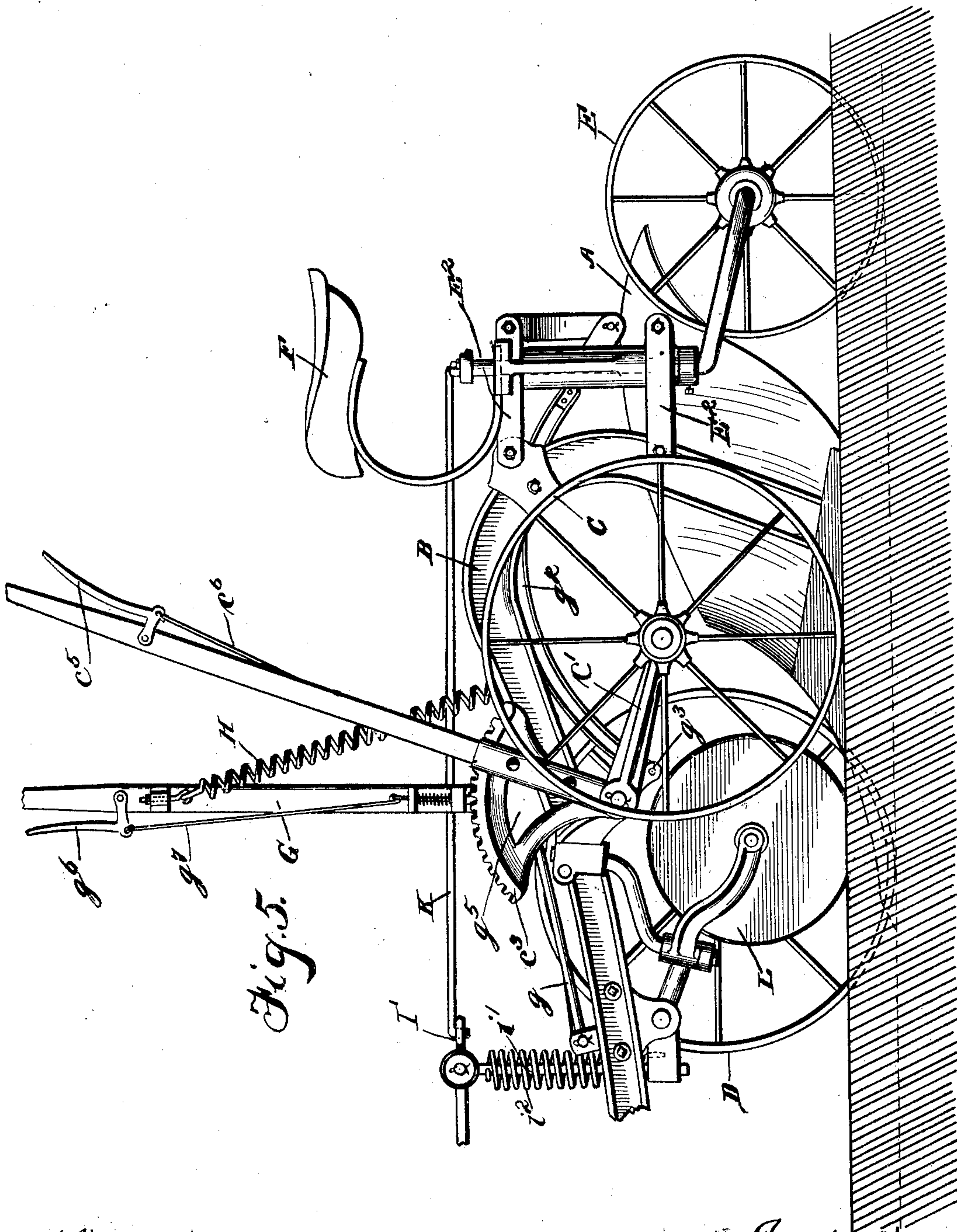
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(No Model.)

6 Sheets—Sheet 3.



Witnesses
J. Weir
J. A. Dwyer

Inventor:
Samuel N. Fineman
By Chas. C. Buckley.
(att'y.)

No. 707,878.

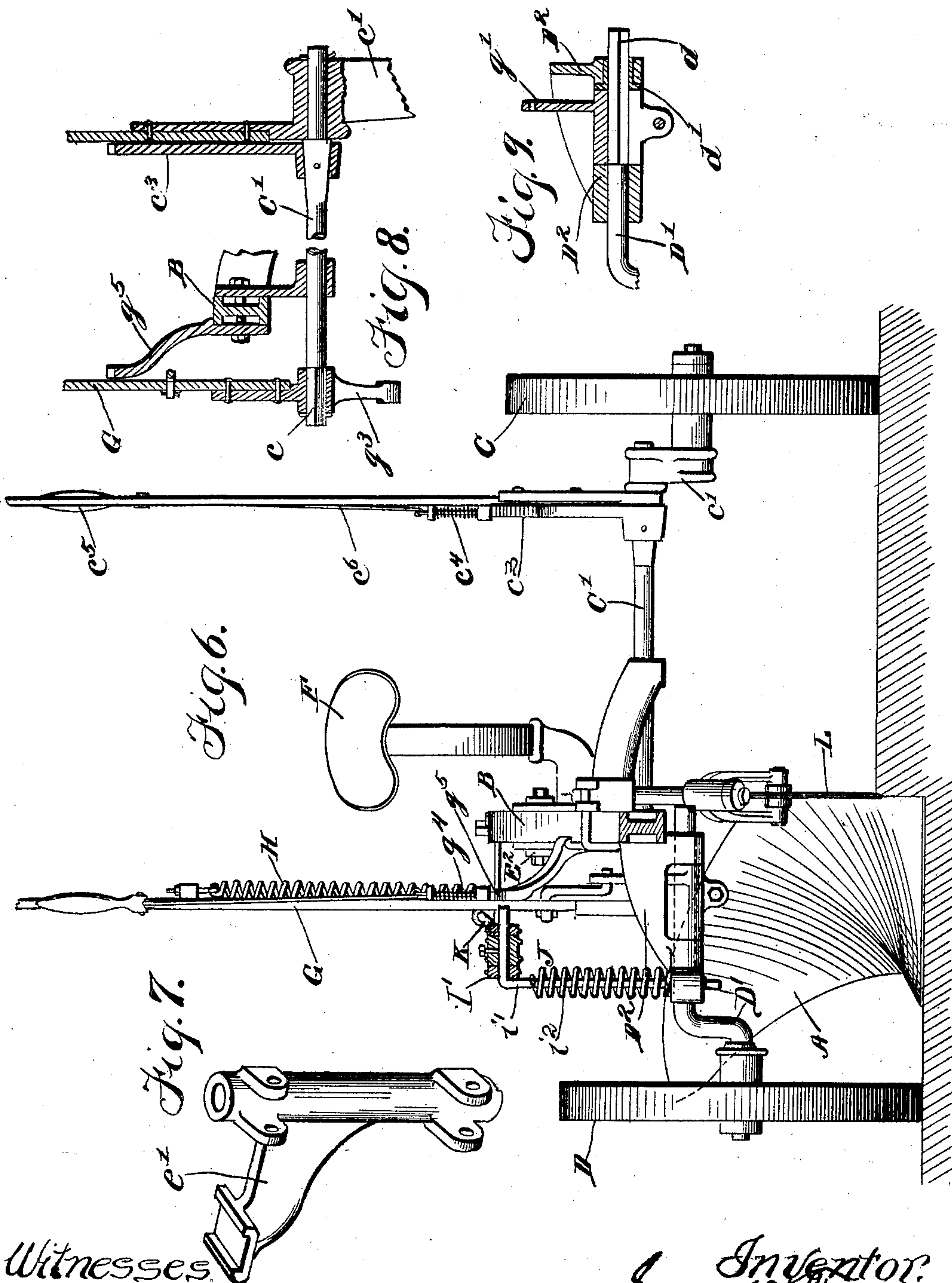
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5 Sheets—Sheet 4.



Witnesses
J. B. Weir
Chas. D. Perry

Inventor:
Samuel H. Tinsman
By Chas. C. Buckley
att'y.

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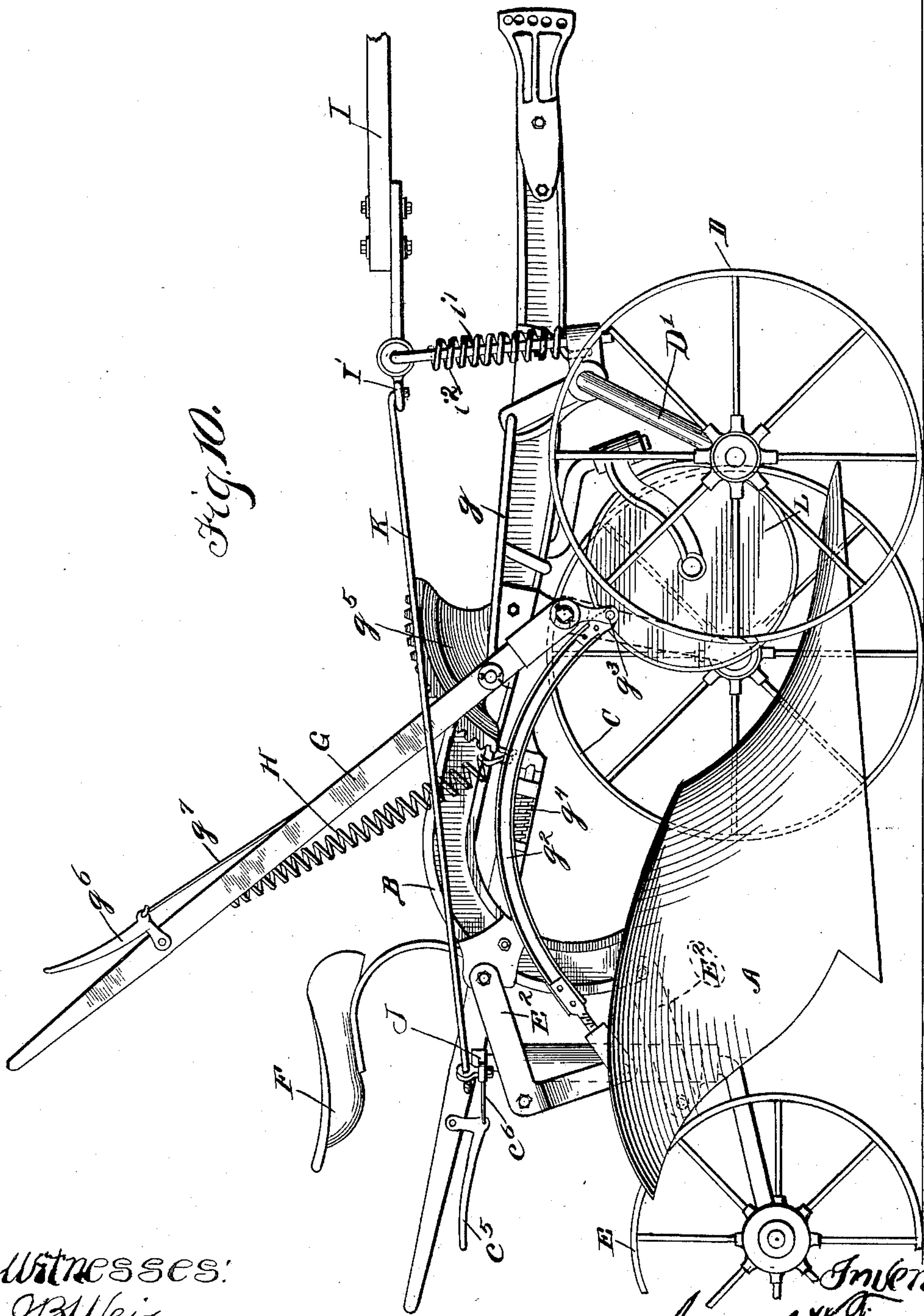
S. H. TINSMAN.

PLOW.

(Application filed Oct. 23, 1901.)

(No Model.)

5 Sheets—Sheet 5.



Witnesses:

J. B. Weir

Ira D. Perry

Inventor
Samuel H. Tinsman
By Chas. C. Bulkeley
Atty.

UNITED STATES PATENT OFFICE.

SAMUEL HENRY TINSMAN, OF DAVENPORT, IOWA, ASSIGNOR TO THE
IMPLEMENT MANUFACTURING COMPANY, OF DAVENPORT, IOWA,
A CORPORATION OF IOWA.

PLOW.

SPECIFICATION forming part of Letters Patent No. 707,878, dated August 26, 1902.

Application filed October 23, 1901. Serial No. 79,612. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HENRY TINS-
MAN, a citizen of the United States, residing
at Davenport, county of Scott, and State of
5 Iowa, have invented certain new and useful
Improvements in Plows, of which the follow-
ing is a specification.

My invention relates to plows of the wheeled
or sulky type, and has for its object the pro-
10 vision of a strong and simple construction
and to provide certain details and features
of improvement tending to increase the gen-
eral efficiency.

Certain special objects of my invention are
15 to provide a construction and arrangement
whereby all of the supporting-wheels can
be simultaneously controlled or adjusted
through the medium of a single lever, to con-
struct and arrange the various parts in such
20 manner as to secure a better and more ad-
vantageous distribution of the strain, to pro-
vide a construction tending to secure rigidity
and to insure against lateral play or side
thrust, to provide a construction and arrange-
25 ment which will permit the plow to be read-
ily raised and lowered and maintained at any
point in its adjustments, to provide an ar-
rangement whereby the plow can be readily
tilted forward for the purpose of preventing
30 its heel from dragging, to provide a construc-
tion and arrangement whereby the plow may
be given any and all necessary or desired ad-
justment, to secure these various adjust-
ments with adjusting mechanism involving a
35 minimum number of parts, and to provide
certain features of construction tending to
secure strength and rigidity and to render a
plow of this character capable of long and
extended service.

40 To the foregoing and other useful ends the
plow and its beam are preferably supported
by three wheels, which are adjustable rela-
tively to the plow-beam and which are suit-
ably connected with a hand-lever. These
45 supporting-wheels have swinging connections
with the plow-beam, and their connection
with the said lever is such that they may be
caused to swing or move relatively to the
plow and the beam. When shifted relatively
50 to the plow and beam, these supporting-

wheels operate to shift or alter the position
of the plow, the arrangement being prefer-
ably such that a movement of the hand-lever
in one direction will operate to raise the plow
clear of the ground, while a movement of the 55
said lever in the opposite direction will oper-
ate to lower the plow into the ground. In
this way the raising and lowering of the plow
is accomplished through the medium of a
single lever. Preferably this lever is ar- 60
ranged within reach of the driver or operator.
The seat for the driver or operator is prefer-
ably supported by the caster-wheel, and as
this caster-wheel is preferably connected with
the plow-beam by means of oppositely-ar- 65
ranged bars or swinging arms it will be seen
that the weight of the driver or operator does
not interfere with the raising of the plow. It
will also be seen that by arranging the said
bars or arms at opposite sides of the caster- 70
wheel spindle the swinging connection thus
formed between this wheel and the plow-
beam is rendered strong and rigid and ca-
pable of preventing lateral play or side swing.
This is an advantageous feature of construc- 75
tion, as in a plow of this character it is de-
sirable that the supporting structure be firm
and rigid and constructed in such manner
that there will be no lateral yielding or side
80 play as a result of loose joints or weak or
faulty construction.

Preferably the front wheels—that is to say,
the land-side wheel and the front furrow-
wheel—are mounted upon a pair of crank-
axles which are mounted to turn in suitable 85
bearings on the plow-beam. As a simple and
effective arrangement for securing the afore-
said simultaneous adjustment of the three
wheels the said lever can be rigidly secured
to the land-side axle, and this lever can also 90
be suitably connected with an arm on the fur-
row-side axle. The connection between this
lever and the caster-wheel can be of any suit-
able form, but is preferably in the nature of
a rod or pitman having its front end pivot- 95
ally connected with the lower end of said le-
ver and having its rear end connected with
the lower end of an arm which projects down-
wardly from the rear end of one of the bars
or swinging arms which connect the caster- 100

wheel with the plow-beam. In order to secure strength and rigidity, a segmental rack for a locking-bolt on said hand-lever is preferably secured to the plow-beam. With this arrangement the said hand-lever can be manipulated or swung either forward or back for the purpose of raising or lowering the plow, it being seen that the arrangement is such that a vibratory movement of the lever will cause both axles to turn or rotate simultaneously and that this swinging or vibratory movement on the part of the lever will also cause a relative shift between the caster-wheel structure and the rear portion of the plow and beam. In other words, this single hand-lever is capable of being manipulated so as to control or adjust all three wheels in such manner as to either raise or lower the plow. Furthermore, the construction and arrangement permit the plow to be maintained at any point in its adjustment without imposing injurious or undesirable strains on any of the various parts.

In order to permit the land-side wheel to be freely adjusted or shifted independently of the balance of the machine, the crank-arm upon which said wheel is mounted is preferably loosely mounted upon the land-side axle and the hand-lever for operating said wheel is preferably rigid with said arm. In this way this land-side wheel, together with its crank-arm and operating-lever, is mounted so as to swing freely upon the land-side axle. The segmental rack for the locking-bolt of this lever is preferably keyed or otherwise rigidly secured to the land-side axle. With this arrangement the land-side arm *c'* can be locked so as to be rigid and swing with the land-side axle, or, if desired, it can be unlocked and allowed to swing or shift independently of said axle. Thus while, as stated, all three wheels are so connected as to be simultaneously controlled or adjusted through the medium of a single lever it will be seen that the land-side and furrow-side wheels can be adjusted or shifted relatively to each other. Further relative shift or adjustment on the part of all three wheels can be obtained by interposing a turnbuckle or like adjusting device between the main operating-lever and the rear caster-wheel. By rotating this turnbuckle the rear supporting-wheel can be adjusted relatively to and independently of the other supporting-wheels, the effect being to either depress or raise the heel of the plow. In this way it is evident that the plow can be tilted forward or adjusted in such manner as to prevent its heel from dragging. The nature and advantages of my invention will, however, hereinafter more fully appear.

In the accompanying drawings, Figure 1 is a side elevation of a wheeled or sulky plow embodying the principles of my invention. In this view the plow is shown in a lowered or working position. Fig. 2 is a detail view illustrating one of the devices employed for connecting the tongue with the rear caster-

wheel. Fig. 3 shows a turnbuckle applied to the rod or pitman which connects the main operating-lever with the bell-crank on the rear caster-wheel structure. Fig. 4 is a plan of the plow shown in Fig. 1. Fig. 5 is a side elevation showing the land side of the plow. In this view the forward portion of the plow-beam and also the tongue are broken away for convenience of illustration. Fig. 6 is a vertical section on line 6 6 in Fig. 1 looking in the direction indicated by the arrows. Fig. 7 is a perspective of the sleeve or box which provides a bearing for the caster-wheel spindle. Fig. 8 is a detail sectional view showing the land-side axle, illustrating the manner in which the main operating-lever is made rigid with said axle, while the lever which is solely for the purpose of adjusting the land-side wheel is loosely mounted upon said axle. Fig. 9 is a detail sectional view showing the furrow-side axle and illustrating the manner in which it turns in its bearings and is at the same time made rigid with the arm which is connected with the main operating-lever. Fig. 10 is a side elevation showing the same side of the machine shown in Fig. 1, but in this view the plow is shown in a raised or elevated position.

As thus illustrated, my invention comprises a plow A of any suitable or approved form and a plow-beam B, which may also be of any suitable known or approved form. In fact, it will be observed that the construction of the plow and its beam is such as is employed for the ordinary walking-plow. The supporting-wheels C and D are preferably arranged toward the front of the machine. There are preferably but three wheels, and the rear supporting-wheel E is, it will be observed, preferably and desirably in the nature of a caster-wheel. The wheel C is the land-side wheel, while the wheel D is what is known as the "furrow-side" wheel. It will also be observed that the furrow-side wheel D is preferably and desirably located somewhat in advance of the land-side wheel C. These three wheels support the plow and permit the latter to be raised from the ground, as shown in Fig. 10, and they also support the plow in operative position, as shown in Figs. 1, 5, and 6. This relative shift or adjustment on the part of the plow and its supporting-wheels is preferably obtained by mounting the wheels C and D on a pair of crank-axes *C'* and *D'*, which are arranged to turn or rotate in suitable bearings *C²* and *D²*. It will be observed that these bearings are in the nature of castings or brackets, which are bolted or otherwise suitably secured to the plow-beam B. This relative shift on the part of the supporting-wheels and plow is also due to the fact that the rear caster-wheel E has its spindle mounted in a box or sleeve *E'*, which is provided with a swinging or shifting connection with the rear portion of the plow-beam. This shifting or swinging connection between the rear caster-wheel and the plow-

beam may be of any suitable character, but is preferably in the nature of a plurality of bars or swinging arms E^2 . These swinging arms or bars are preferably arranged as shown in the drawings, wherein it will be seen that two of said bars are arranged at the upper end of the sleeve or box E' , while a like pair of said bars or arms are arranged at the bottom. In this way the connection between the sleeve or box E' and the plow-beam is in the nature of a parallel movement, the bars or swinging arms E^2 being arranged on opposite sides of the beam and box or sleeve E' and this arrangement operating to prevent lateral shift or side swing on the part of the box or sleeve E' relatively to the plow-beam. In this way the swinging connection between the caster-wheel and the plow-beam is of such character as to insure rigidity and prevent a lateral yielding or looseness, which would be likely to result from loose joints or a weak and faulty construction. This will be readily understood by referring to Figs. 1, 4, and 5, wherein it will be seen that the swinging bars or arms E^2 are positioned at each side of the plow-beam and the box or sleeve E' and that while the caster-wheel and the plow-beam are thereby connected in such manner as to be capable of vertical movement or shift relatively to each other the connection is not such as will permit any horizontal or lateral shift on the part of the beam and sleeve or box E' relatively to each other. A seat F is provided and preferably mounted upon the arm e' , which projects from the land-side portion of the sleeve or box E' . In this way the weight of the driver or operator is sustained entirely by the caster-wheel E , and in raising or lowering the plow the weight of the driver or operator does not, therefore, in any way interfere. The bodily raising and lowering of the plow is obtained by shifting or adjusting all three wheels relatively to the plow and beam. As a matter of special improvement all three wheels are mounted and connected in such manner as to be simultaneously controlled or adjusted through the medium of a single operating-lever G . This is an advantage, as it reduces to a minimum the amount of exertion and manipulation of adjusting means necessary on the part of the operator in raising and lowering the plow. Preferably this simultaneous adjustment of the three wheels is obtained by rigidly mounting the lever G upon the land-side axle C' —as, for example, by providing the lower end of the lever with a squared socket adapted to engage the squared end c of the said axle. This simultaneous adjustment of the three wheels is also due to the fact that this lever G is suitably connected with the furrow-side axle D' and to the further fact that the lower end of this lever is suitably connected with one of the swinging bars or arms E^2 . The connection between the lever G and the furrow-side axle may, for example, consist of a rod or pitman g , the rear end of this rod being suitably attached

to said lever and its forward end being adapted to engage a crank-arm g' , which latter is rigidly secured to said furrow-side axle. The connection between said lever and the rear supporting-wheel can be of any suitable form or construction; but as a simple and effective arrangement this connection may comprise a rod or pitman g^2 , having its rear end pivotally attached to the lower end of the downwardly-projecting arm e^2 , which latter, it will be observed, is rigid with one of the upper bars or swinging arms E^2 . The bar or arm E^2 is in this way practically a bell-crank lever having its elbow attached to the sleeve or box E' and its forward end attached to the plow-beam B . The rod or pitman g^2 is, it will be observed, preferably given an upward bow or curve in order to prevent it from interfering with the sod or soil which is overturned by the moldboard of the plow. As a means of securing the proper connection the forward end of this rod or pitman g^2 can be pivotally attached to the lower end of the small arm g^3 , projecting from the lower end or hub portion of the lever G . In this way all three wheels are supplied with connecting means whereby the vibratory movement of the lever G will operate to adjust said wheels relatively to the plow and beam. For example, a backward pull exerted by the operator upon this lever G will operate to rotate both the land-side and furrow-side axles in a direction to depress the wheels C and D , and thereby lift the forward portion of the plow-beam, and at the same time this movement of the lever G will, through the medium of the rod or pitman g^2 , exert a pull upon the lower end of the arm e^2 , thereby causing the bell-crank lever to lift the rear portion of the plow and beam. In this way the rotation of the crank-axes and the swinging movement of the bell-crank operate to lift the plow and beam bodily, and a further slight relative adjustment on the part of the land-side wheel independently of the balance of the machine will then operate to place the plow and beam in the elevated position shown in Fig. 10. In this view it will be seen that the plow is raised clear of the ground and that it is locked in this position by reason of the bolt g^4 being in engagement with the rack g^5 . This rack, it will be seen, is preferably secured to the plow-beam and, together with the said locking-bolt, constitutes a locking device for locking the lever G at any point in its swinging adjustment. It will be readily understood that the means for operating the locking-bolt g^4 can be of any suitable or approved form—as, for example, the small bell-crank lever g^6 , which is mounted at the upper end of said lever and which is connected with the locking-bolt by a rod g^7 . With this arrangement it will be seen that the lever G can be thrown forward or back, so as to either depress or raise the plow, and that it can then be locked in such position, so as to maintain the plow at any point in its adjustment. Strength

and rigidity are secured by securing the rack g^5 to the plow-beam, and with the described arrangement of the crank-axles and the connecting means it will be seen that the plow can be maintained at an intermediate point of its adjustment without imposing any injurious or undesirable strains on the adjusting mechanism. In other words, the adjusting mechanism is adapted and arranged to withstand the strains incident to raising or lowering the plow and also adapted to sustain without injury the strains which are incident to the operation of the plow.

In Fig. 3 I have shown a portion of the rod or pitman g^2 and also a turnbuckle Z applied to this rod or pitman, the object being to provide means whereby the rod or pitman can be shortened or lengthened for the purpose of varying the distance between its two ends. For example, the plow can be lowered to a working position, as shown in Fig. 1, and then by tightening this turnbuckle the heel of the plow can be elevated sufficiently to prevent it from dragging in the furrow. A practical lengthening and shortening of this rod or pitman g^2 may also be provided for by constructing its rear end in the manners shown in Fig. 1. In this view it will be seen that the rear end portion of this rod or pitman is provided with a reduced threaded portion g^8 , adapted to engage a threaded socket in the fork or bifurcated portion g^9 , which is pivoted to the lower end of the arm e^2 . This portion g^9 can be detached from the bell-crank and can then be rotated for the purpose of adjusting it upon the threaded portion g^8 , so as to either lengthen or shorten the pull-rod. With either arrangement, however, the plow can be tilted or inclined forward, so as to prevent its heel from dragging in the furrow.

Referring to Fig. 9, it will be seen that the furrow-side axle D' is mounted in the bearing provided by the casting or bracket D^2 and that this bracket or casting is adapted to provide a gap or opening in which the crank-arm g' is located and suitably mounted upon said axle. Preferably this crank-arm g' is provided with a split collar or hub portion, whereby it may be clamped upon the squared or polygonal portion d' of the crank-axle D' and whereby this axle may be shifted longitudinally for the purpose of varying the line of travel of the furrow-side wheel. The squared end portion of the furrow-side axle is preferably provided with a flanged sleeve or ring d' , which rotates in the bearing provided by the casting D^2 . With this arrangement the axle is free to rock or turn in its bearing, but is at the same time capable of being adjusted endwise or longitudinally in the manner and for the purpose previously stated. For example, the bolt which tightens the split collar or hub portion of the arm g' can be loosened, and this will permit the axle D' to slide outwardly, so as to carry the furrow-side wheel farther away from the land-side wheel. The bolt for the split portion of

the arm g' can then be retightened, and when this is done the axle D' is again held firmly against longitudinal shift, but is, as stated, free to rock or rotate in its bearing.

It is preferable and desirable that the land-side wheel C be capable of more or less shift or adjustment independently of the balance of the machine. For instance, as will be seen in Fig. 1, it is desirable in operating the plow to have the land-side wheel adjusted to a point somewhat above the furrow-side wheel, so as to allow the machine to travel in a level condition, as shown in Fig. 6. This independent shift or adjustment on the part of the land-side wheel may be provided for in any suitable or approved way; but as a matter of further and special improvement the crank-arm c' is loosely mounted upon the land-side axle C' and is adapted at its lower end to carry the land-side wheel. (See particularly Figs. 4 and 8.) In said Fig. 8 it will be seen that the crank-arm c' for the land-side wheel is loosely mounted, so as to be free to turn or rotate upon the axle C and that the hand-lever c^2 is rigid with said crank-arm. This hand-lever is adapted to serve as a means for adjusting or manipulating the land-side wheel, it being seen that the driver or operator occupying the seat F can grasp this lever and employ it for positioning the wheel C in accordance with the desired adjustment for the plow. In order, however, that this wheel C may be rendered capable of simultaneous adjustment with the other wheels in the manner already described, the rack c^3 is keyed, pinned, or otherwise suitably secured to the axle C' . This rack is arranged in position to be engaged by the lock or bolt c^4 , which is, as in the previous case, operated by a bell-crank c^5 and rod c^6 . In this way when the bolt c^4 engages the rack c^3 the crank-arm c' , and consequently the land-side wheel C, are rendered rigid with the axle C' . With the lever c^2 thus locked in engagement with the land-side axle the wheels C and D are connected, so as to be simultaneously controlled or adjusted by the main operating-lever G. As stated, however, the bolt c^4 can be withdrawn, so as to disengage or unlock the lever c^2 , and the wheel C can then be adjusted relatively to and independently of the balance of the machine. In this connection it will be seen that both levers are mounted upon the land-side axle, but that the arrangement is such that the operating-lever G is keyed or rigidly secured to said axle, while the land-side lever c^2 is loose on said axle but rigid with the crank-arm which carries the land-side wheel C. Thus the land-side wheel can be made to turn either with or independently of the land-side axle.

With further reference to the bodily raising and lowering of the plow, the raising of the plow is preferably facilitated by connecting the lever G with the plow-beam by means of a spring H. This spring it will be observed is under tension when the plow is in the

ground or operating and exerts its tension in such manner as to tend to draw the lever G backward, and thereby raise the plow off the ground. Thus the spring is normally under tension, and as soon as the locking-bolt g^4 is disengaged from the rack g^5 the spring operates as a means for automatically raising the plow from the ground. It will be understood, however, that this spring is not of such strength and character as to render it difficult to throw the lever forward in lowering the plow into the ground. Preferably this spring is of such strength and character as to simply assist the driver or operator in drawing the lever back for the purpose of raising the plow from the ground.

It will be seen that I provide a construction of such character as to preclude all possibility of lateral play or side thrust and that the construction and arrangement of the parts are such as to prevent injurious or undesirable strains being imposed upon the adjusting mechanism; also that the construction and arrangement are such that all three wheels can be simultaneously adjusted or shifted relatively to the plow and beam for the purpose of either raising or lowering the plow. Furthermore, the plow is capable of being given all necessary or desired adjustments with comparatively little exertion on the part of the operator. A wheeled plow thus constructed can, if desired, be provided with a tongue I, which will serve to prevent the plow from running onto the team when going downhill. It will be readily understood that this tongue does not sustain the draft, but merely serves as a means for holding back the plow. The draft appliances, which, it will be understood, can be of any suitable or approved form, are connected in any suitable manner with the forward end of the plow-beam. The tongue I when employed is preferably mounted upon an upright i' , which latter is preferably secured in the casting D². The upper end of this upright i' is preferably bent over to provide a connecting pin or bolt for the rear end of the tongue and the short pivoted portion I'. This portion I' is preferably and desirably provided with a slot i , which, it will be observed, extends crosswise of the machine. The caster-wheel spindle can be provided with an arm J, and this arm can be connected with the tongue structure by means of the rod K. Preferably the arrangement consists in providing the forward end of this rod K with an end portion adapted to engage the slot i . With this arrangement the rod K will hold the caster-wheel parallel with the plow-beam while the plow is running straight ahead. When the tongue is swung to one side, however, the slot i permits back-and-forth play on the part of the rod K, and in this way the caster-wheel is "released," so to speak, or unlocked as soon as the tongue I is swung to either side. In other words, the connection between the caster-wheel and tongue is such that while the plow is moving straight

ahead the caster-wheel will be held firmly in line with the plow-beam. As stated, however, when the tongue swings to either side the slot i permits back-and-forth or end play on the part of rod K, and thereby allows the caster-wheel to swing freely to either side and to operate in a way to thereby permit the plow to be turned readily to either side or completely around. In order to prevent the plow from accidentally swerving to one side or the other when not in the ground, the standard i' can be provided with a spring i^2 , which tends to keep the tongue I parallel with the plow-beam. The upper end of this spring is secured to the standard i , while its lower end is secured to the bracket D². In other words, this spring is applied in such manner as to resist lateral or side swing on the part of the tongue. In this way there will be no tendency on the part of the plow when out of the ground to swerve or swing to one side or the other—as, for example, in going downhill, in which case the plow is held back by the tongue. It will be understood, however, that this spring i^2 is not of sufficient strength or tension to interfere with the operation of the tongue when the plow is in use and at such times as it may be desired to turn the plow around. The spring is, as stated, of sufficient strength to keep the plow in line with the tongue while out of the ground, but is not of sufficient strength to prevent the tongue from being swung readily to one side or the other when the plow is in the ground and when it is desired to turn to one side or the other or to turn the plow completely around.

If desired, a colter-wheel L can be provided and arranged to precede the plow in the usual manner. It will be readily understood that this colter-wheel can be of any known or approved form, and that its connections with the plow-beam can be of any suitable form or character.

It will be readily seen, however, that the various features of my invention may be readily modified or changed without departing from the spirit of my invention. For this reason I do not limit myself to the exact construction shown and described. In application Serial No. 91,314, filed January 27, 1902, I have claimed my invention broadly, while in this application I have elected to claim certain features specifically.

What I claim as my invention is—

1. A wheeled plow comprising a suitable plow and plow-beam, a plurality of crank-axles, furrow and land side wheels mounted on said axles, a rear caster-wheel, a shifting connection between the caster-wheel and plow-beam, a lever connected and arranged for simultaneously rotating both of said axles and operating said shifting connection, so as to cause a bodily rise and fall of the plow, and a second lever connected and arranged for operating said land-side wheel independently of the others.

2. A frameless high-lift sulky-plow, com-

prising a suitable plow and plow-beam, a plurality of crank-axles, furrow and land side wheels mounted on said axles, a rear caster-wheel, a shifting connection between said rear wheel and said plow-beam, a lever mounted on one of said axles and arranged for simultaneously rotating both axles and operating said shifting connection, and a second lever arranged for operating said land-side wheel independently of the other wheels.

3. A wheeled plow comprising a suitable plow and plow-beam, a pair of crank-axles arranged one in front of the other, a hand-lever secured rigidly to one crank-axle, an arm rigidly secured to the other crank-axle, a connecting-rod extending between said arm and said lever, a land-side wheel mounted on the axle to which the said lever is rigidly secured, a furrow-side wheel mounted on the axle to which the said arm is secured, a rear supporting-wheel capable of bodily shift or movement relatively to the plow or plow-beam, and suitable connection between said lever and said rear supporting-wheel, the said lever being thereby operative to cause both the front and rear supporting-wheels to shift or move relatively to the plow or plow-beam for the purpose of either raising or lowering the plow, substantially as described.

4. A wheeled plow comprising a suitable plow, a beam, a pair of crank-axles, wheels on said axles, a hand-lever secured rigidly to one of said crank-axles, a crank-arm on the other axle, a rod connecting said arm with said lever, a wheeled structure for supporting the rear end of the plow and beam, a rack bolted to the beam, and a locking device on the lever adapted to engage said rack, substantially as described.

5. In a wheeled plow, the combination of a suitable plow and beam, a pair of crank-axles arranged one in front of the other at the forward portion of the plow-beam, furrow and land side wheels on said axles, a trailing caster-wheel adapted and arranged to support the rear end of the plow and beam, a lever rigidly secured to the land-side axle and connected and arranged for simultaneously controlling or adjusting all three wheels, and a second lever loosely mounted upon the land-side axle and adapted to independently shift or adjust the land-side wheel, substantially as described.

6. In a wheeled plow, the combination of a suitable plow and beam, a pair of crank-axles, wheels on said axles, a lever suitably connected and arranged for rocking or rotating said axles, a rear supporting-wheel having a shifting connection with said plow-beam, suitable connection between said lever and rear supporting-wheel, and a spring arranged to connect said lever with said plow-beam, the tension of the spring tending to draw the lever back and thereby shift or adjust all the supporting-wheels relatively to the plow and beam in such manner as to raise the plow from the ground, substantially as described.

7. In a wheeled plow, the combination of a

suitable plow and beam, a pair of crank-axles, a pair of levers mounted on one axle and adapted and arranged for rocking said axles, supporting-wheels on said axles, a rack secured to the plow-beam and adapted to engage a locking device on one of said levers, a segmental rack rigid with the axle on which the said levers are mounted and adapted to engage a locking device on the other lever, and a rear trailing wheel having suitable connection with one of said levers, substantially as described.

8. In a wheeled plow the combination of a suitable plow and beam, a pair of crank-axles, supporting-wheels on said axles, a rear supporting-wheel for supporting the rear end of said plow and beam, a lever rigid with one of said axles, a rack secured to the plow-beam, a manually-operated locking device mounted on said lever and adapted to engage said rack, suitable connection between said axles adapted to cause the axles to rotate in unison, and suitable connection between said lever and said rear supporting-wheel, the lever thereby being operative to cause all the supporting-wheels to shift or move relatively to the plow and plow-beam for the purpose of either raising or lowering the plow, substantially as described.

9. In a wheeled plow, the combination of a suitable plow and beam, forward supporting-wheels, a rear trailing caster-wheel, a suitable sleeve for the spindle of said caster-wheel, and swinging arms for connecting the said sleeve with the rear portion of said plow-beam, said swinging arms being arranged in pairs, one at each side of the beam and the sleeve, and the swinging connection thereby provided being in the nature of a parallel movement for permitting relative shift or movement on the part of said caster-wheel and the said plow and beam, substantially as described.

10. In a wheeled plow, the combination of a suitable plow and beam, a plurality of crank-axles, forward supporting-wheels, mounted on said axles, a rear trailing caster-wheel, a suitable sleeve providing a bearing for the spindle of said caster-wheel, an upper pair of swinging arms arranged one at each side of the said sleeve and adapted to connect the latter with the rear portion of the plow-beam, a lower and similar pair of swinging arms adapted and arranged to connect the lower portion of said sleeve with the plow-beam, the members of each pair of arms in this way being arranged one at each side of the sleeve and the beam, and constituting a parallel movement for permitting relative shift or movement on the part of said plow and caster-wheel, substantially as described.

11. In a wheeled plow, the combination of a suitable plow and beam, a plurality of crank-axles, forward supporting-wheels mounted on said axles, a rear trailing caster-wheel for supporting the rear end of said plow and beam, a suitable sleeve adapted to provide a

bearing for the spindle of said caster-wheel, an upper pair of swinging arms arranged at each side of the sleeve and adapted to connect the latter with the plow-beam, a lower
 5 and similar pair of arms arranged one at each side of the sleeve and adapted to connect the same with the plow-beam, a swinging hand-lever, an arm projecting downwardly from the rear end of one of the upper swinging
 10 arms, the swinging arm thus provided with a downwardly-swinging extending arm constituting a bell-crank, and a suitable rod for connecting said lever with the lower end of said downwardly-projecting arm of the bell-
 15 crank, the lever thereby being operative to exert a pull upon said rod for the purpose of causing the caster-wheel to shift relatively to the plow and beam for the purpose of lifting and raising the plow from the ground, sub-
 20 stantially as described.

12. In a wheeled plow, the combination of a suitable plow and beam, a pair of crank-axles adapted to provide suitable spindles for the land-side and furrow-side wheels, two
 25 hand-levers for causing relative shift on the part of said wheels and also for causing simultaneous shift on the part of such wheels relatively to the plow and beam, a rear trailing or supporting wheel adapted and ar-
 30 ranged to support the rear end of said plow and beam, a bell-crank forming part of a swinging connection between said rear supporting-wheel and the plow-beam, a pitman or connecting rod adapted to serve as a pull-
 35 rod for connecting one of said levers with said bell-crank, the lever thus connected with the bell-crank being also suitably connected with both crank-axles, whereby all three supporting-wheels may be controlled or adjusted

through the medium of a single lever, and 40 the other of said levers being suitably mounted and arranged for independent movement for the purpose of adjusting the land-side wheel independently of the balance of the machine, substantially as described. 45

13. In a wheeled plow, the combination of a suitable plow and beam, a pair of crank-axles, supporting-wheels on said axles, a lever on one of said axles, a crank-arm mounted upon the other of said axles and provided 50 with a fastening device which permits longitudinal or end movement on the part of said axle relatively to the crank-arm, a rod or the like for connecting said lever with said crank-arm, a wheeled structure for supporting the 55 rear part of said plow and beam, and connecting means whereby said lever is operative to simultaneously adjust or shift all the supporting-wheels relatively to the plow and beam for the purpose of either raising or low- 60 ering the plow, substantially as described.

14. In a wheeled plow, the combination of a suitable plow and beam, forward supporting-wheels, a wheeled structure for supporting the rear end of said plow and beam, and 65 a turnbuckle adapted and applied for causing relative shift on the part of said plow and said wheeled supporting structure, so as to tilt the plow forward and thereby prevent its heel from dragging in the furrow, substan- 70 tially as described.

Signed by me at Davenport, Scott county, Iowa, this 18th day of October, 1901.

SAMUEL HENRY TINSMAN.

Witnesses:

A. B. FRENTER,
 A. G. SAMPSON.