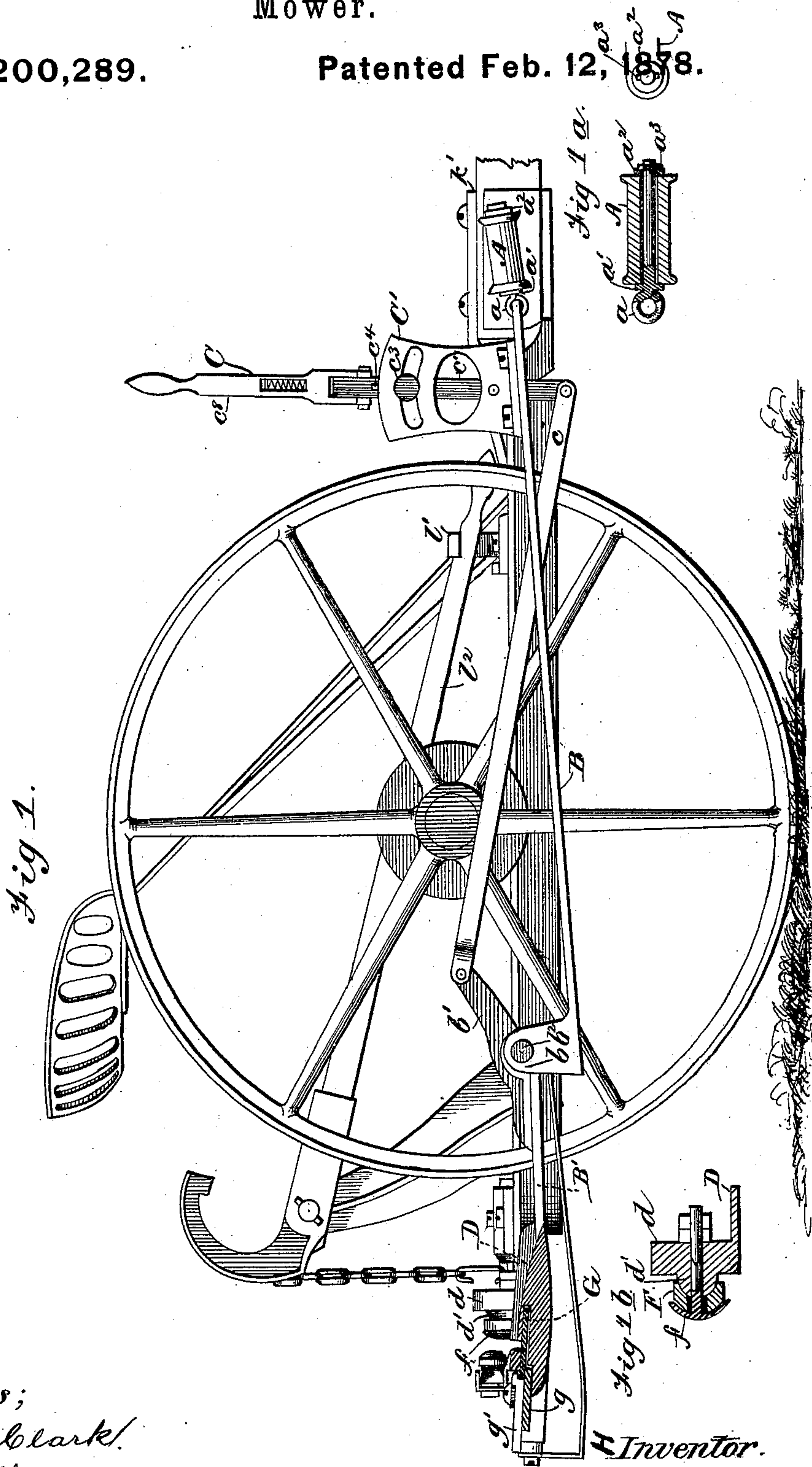


J. HARRIS.
Mower.

No. 200,289.

Patented Feb. 12, 1878.



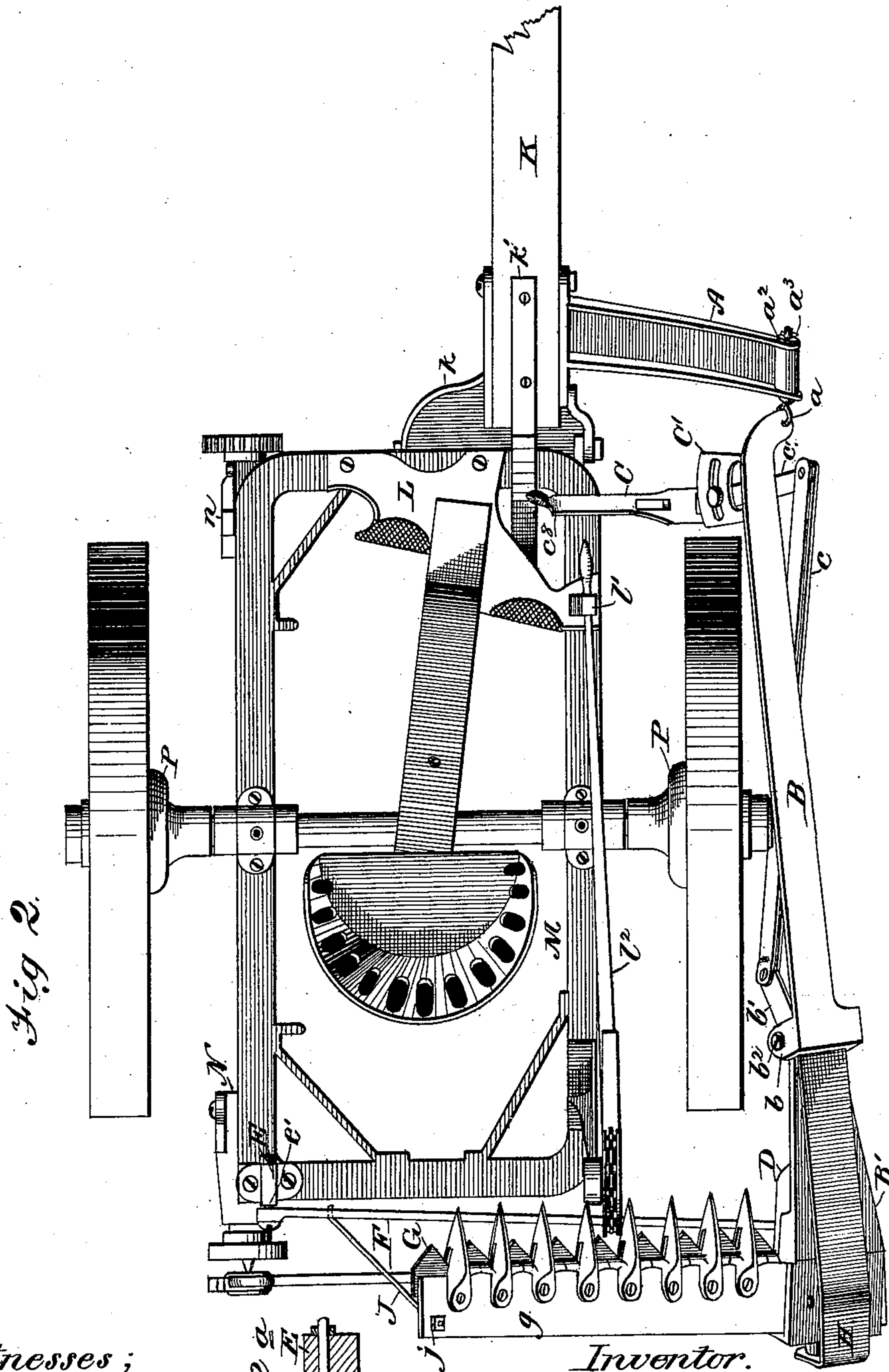
Witnesses;
Harry S. Clark.
M. C. Stallings

Inventor.
James Harris
by H. W. Beadle & Co.
His Attys.

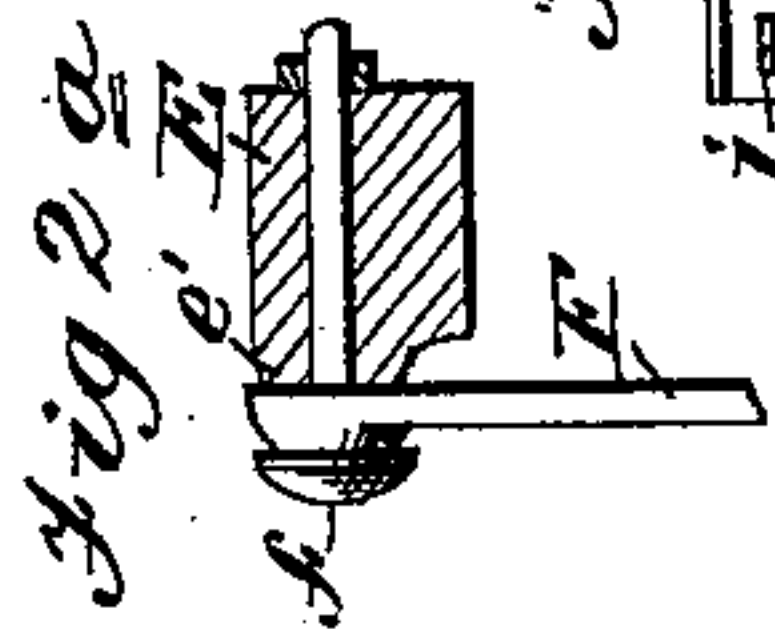
J. HARRIS.
Mower.

No. 200,289.

Patented Feb. 12, 1878.



Witnesses;
Harry B. Clark.
W. B. Stallings



Inventor.

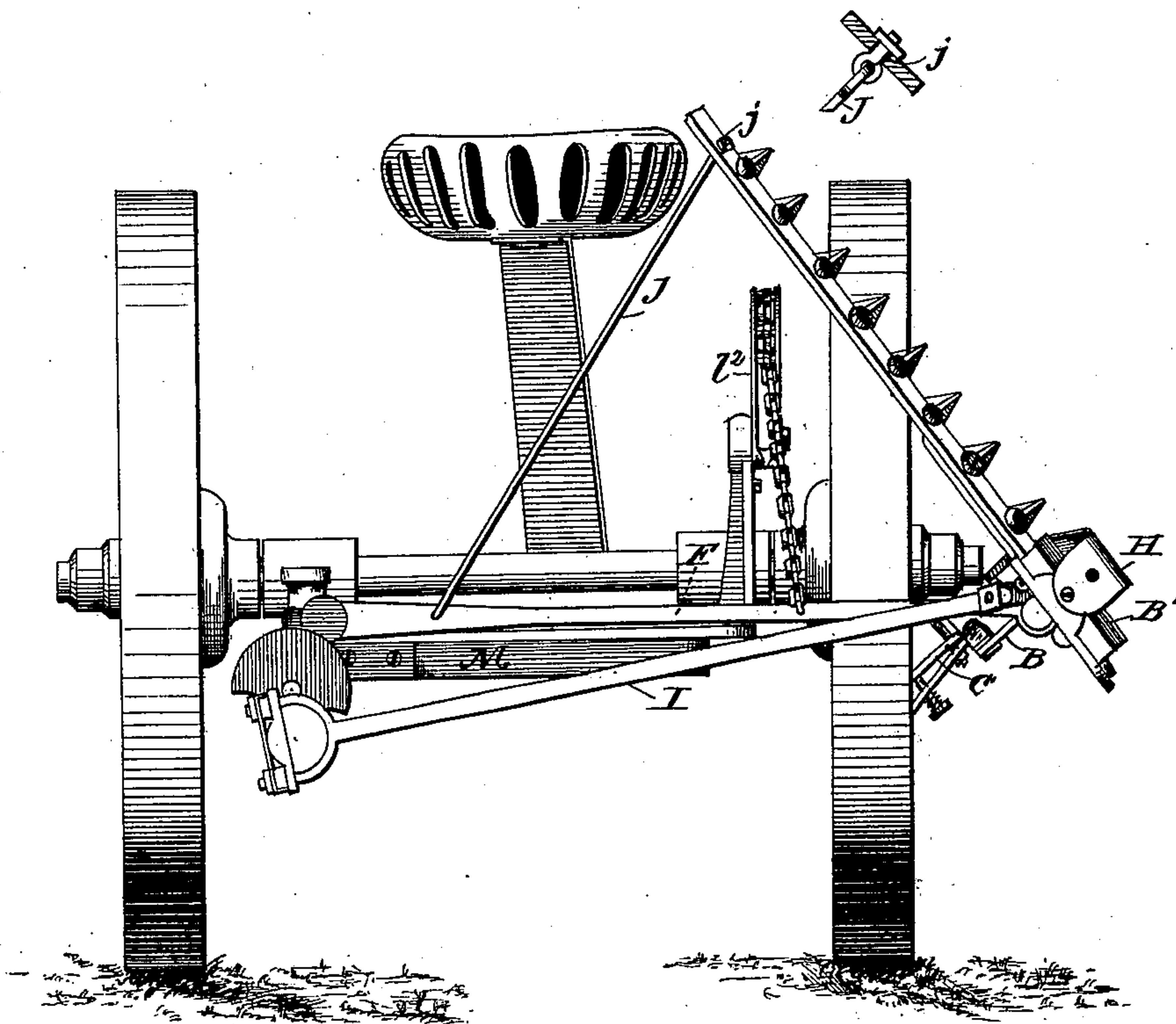
James Harris.
by H. W. Beadle & Co
his Attys.

J. HARRIS.
Mower.

No. 200,289.

Patented Feb. 12, 1878.

Fig 3



Witnesses.

Harry C. Clark.

M. C. Stallings.

Inventor.

James Harris

by H. W. Beadle & Co

his Attys.

J. HARRIS.
Mower.

No. 200,289.

Patented Feb. 12, 1878.

Fig 4

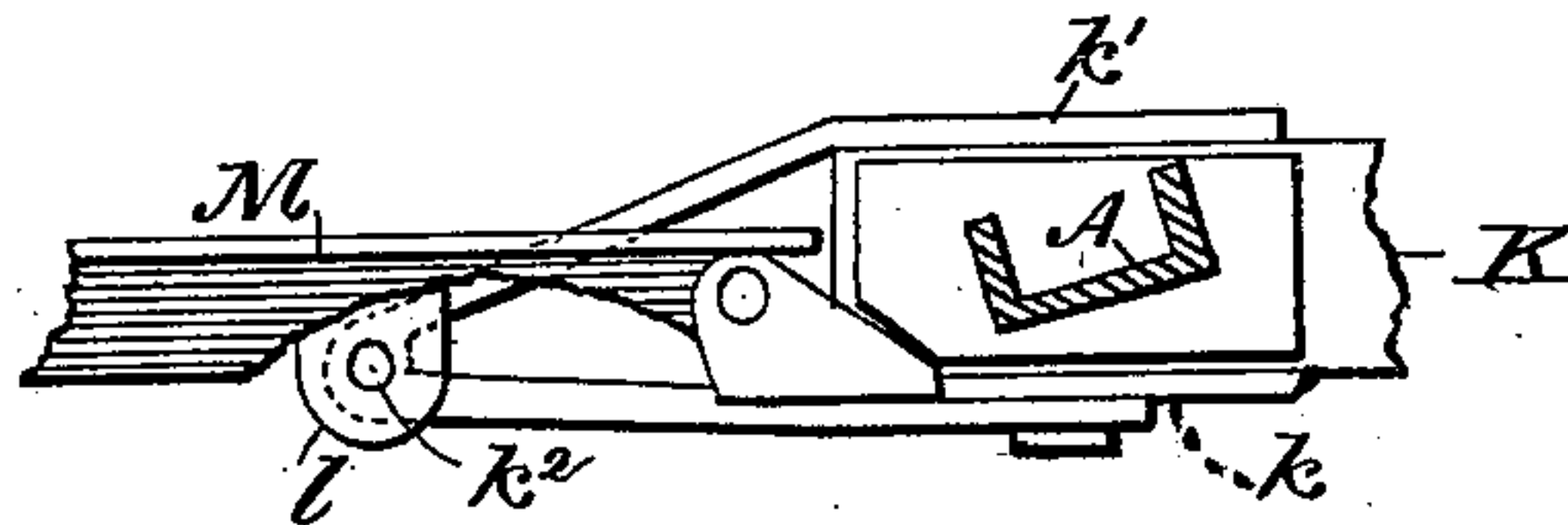


Fig 5

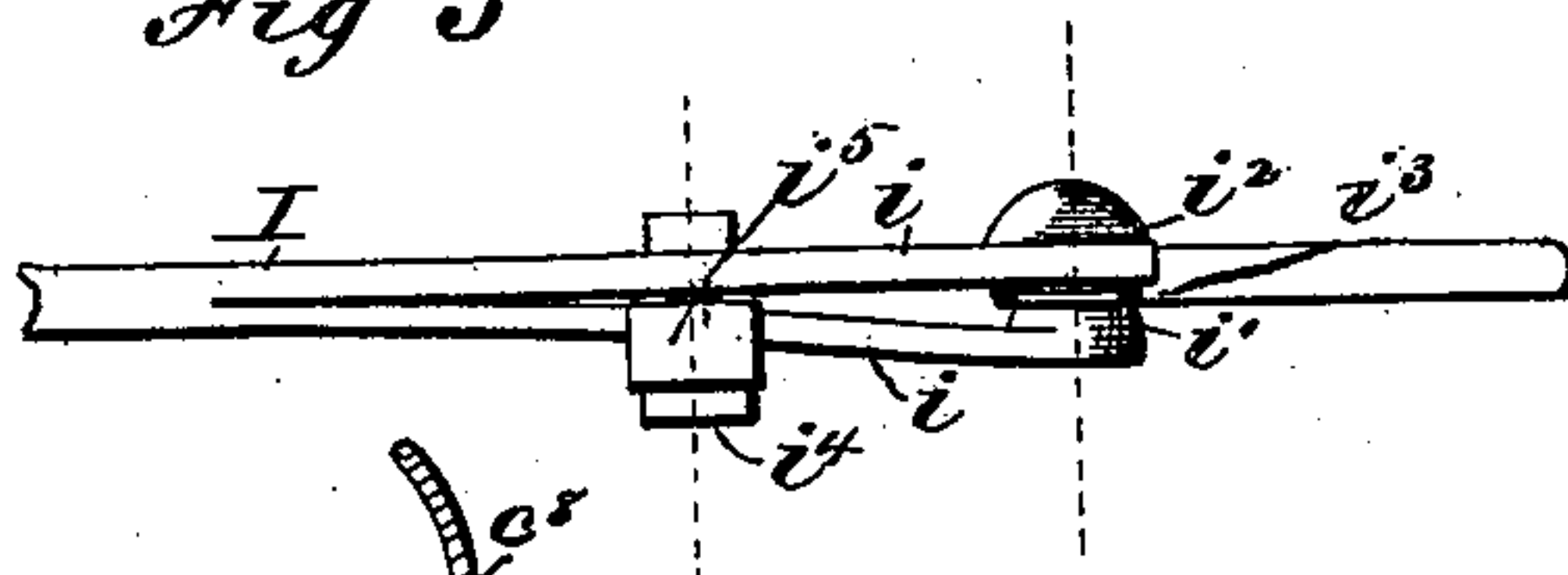


Fig 6

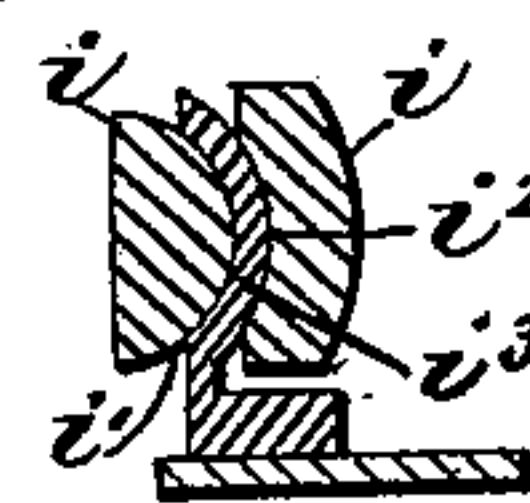


Fig 7

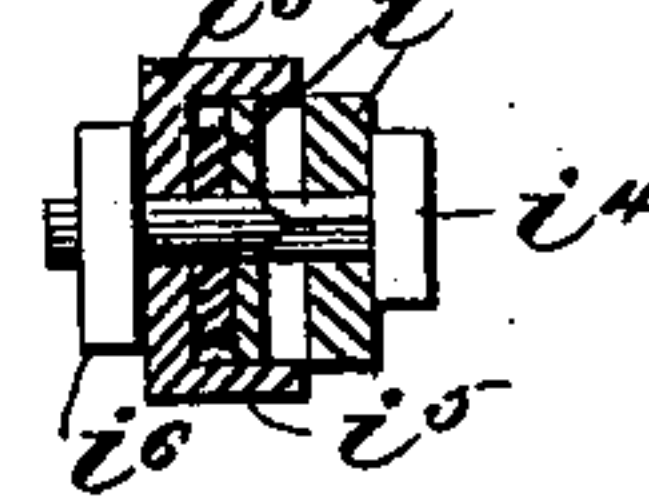


Fig 8

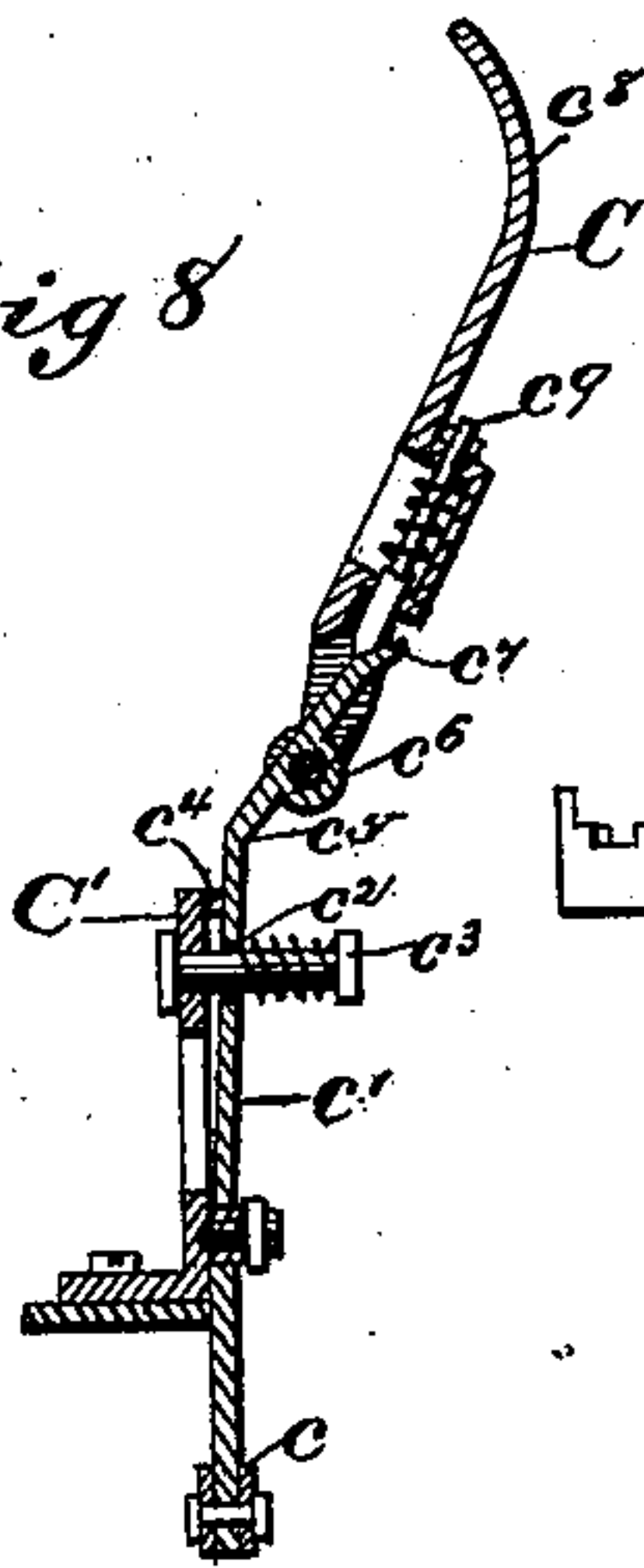


Fig 9

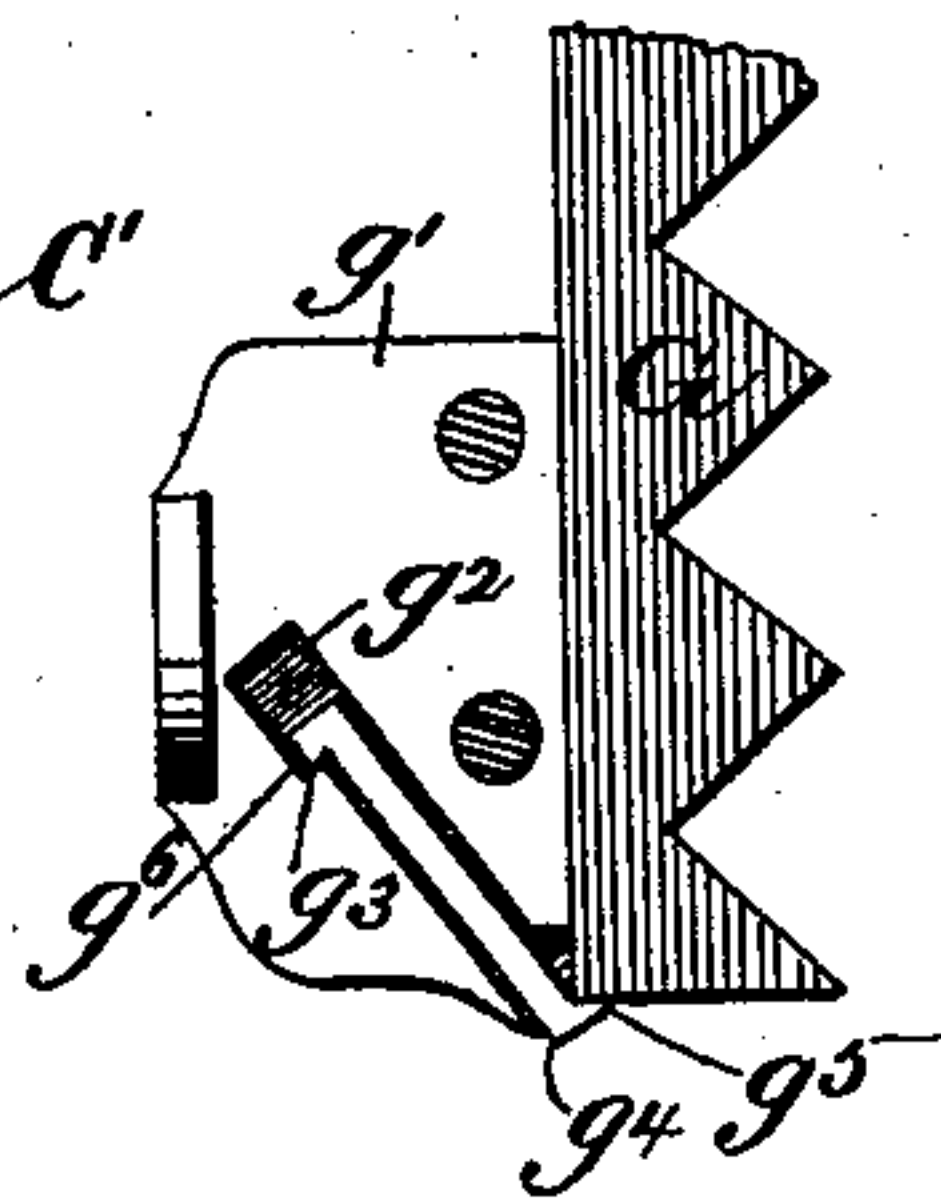


Fig 10

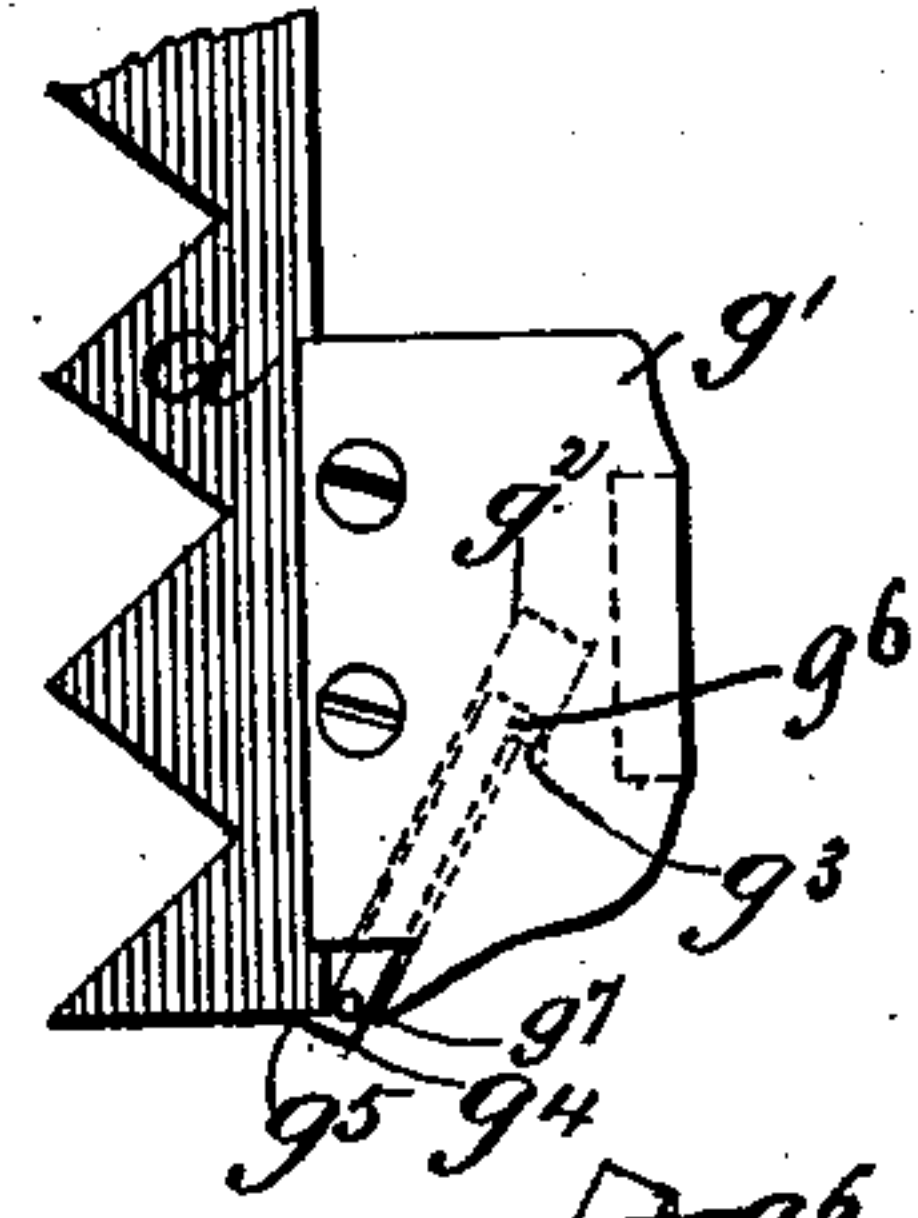
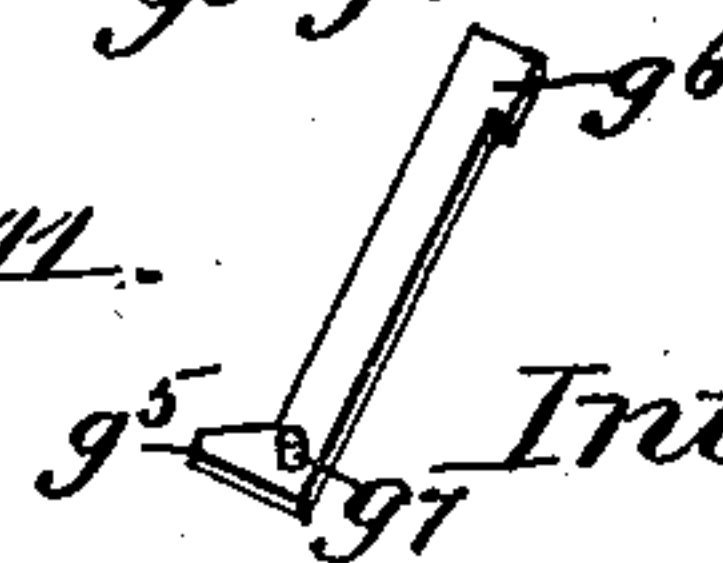


Fig 11



Witnesses;
Harry C. Clark.
M. C. Stallings.

Inventor.
James Harris
by H. W. Beadle & Co
his Attys.

J. HARRIS.
Mower.

No. 200,289.

Patented Feb. 12, 1878.

Fig 12

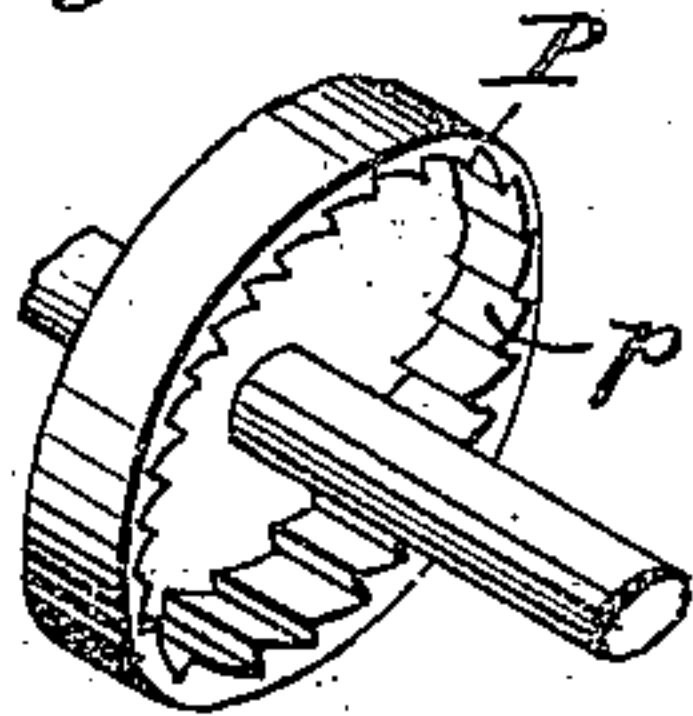


Fig 13

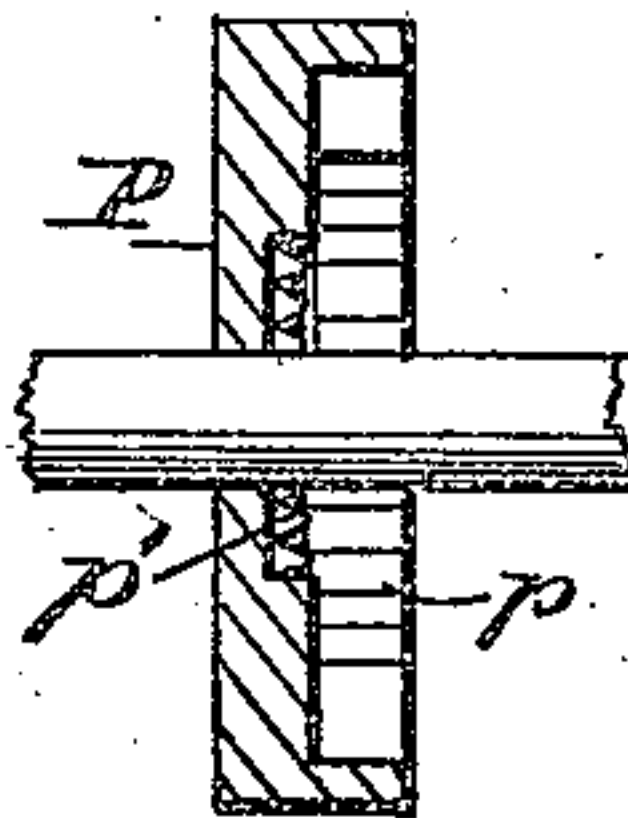


Fig 14

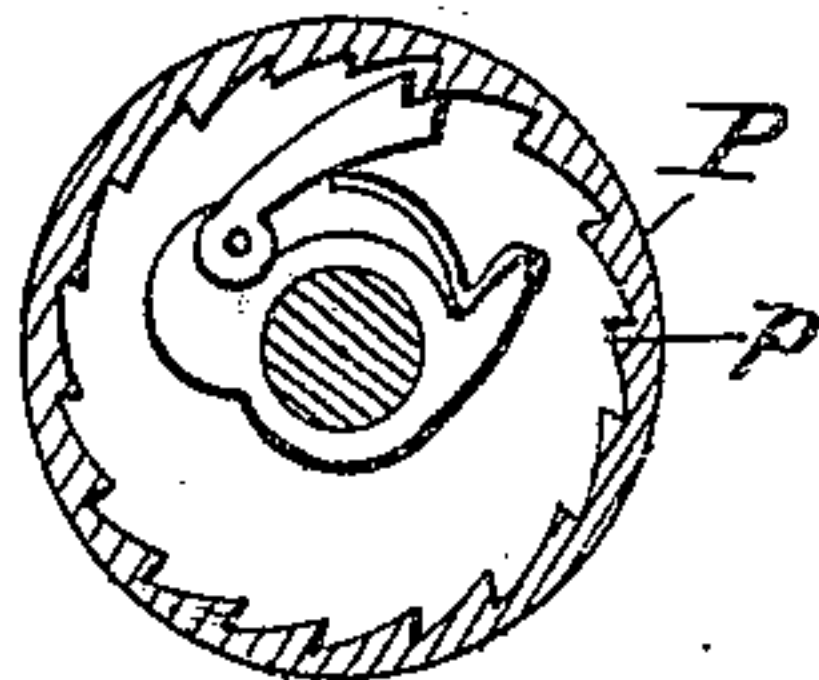


Fig 15

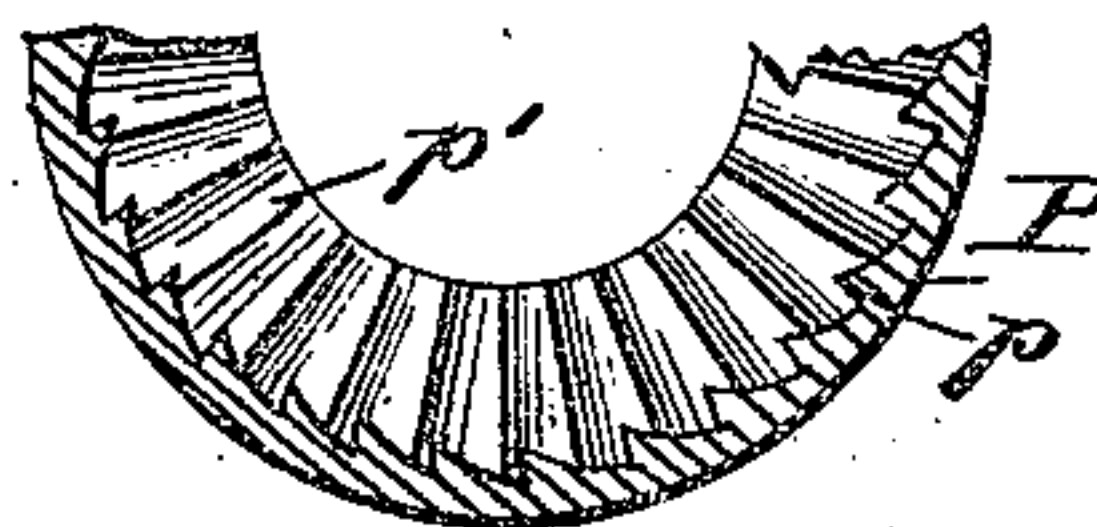


Fig 16

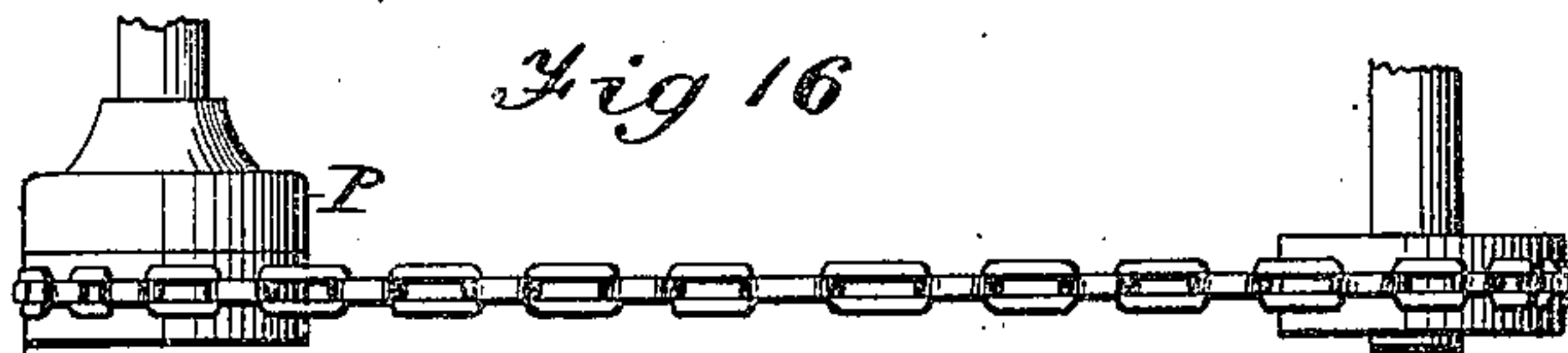


Fig 17

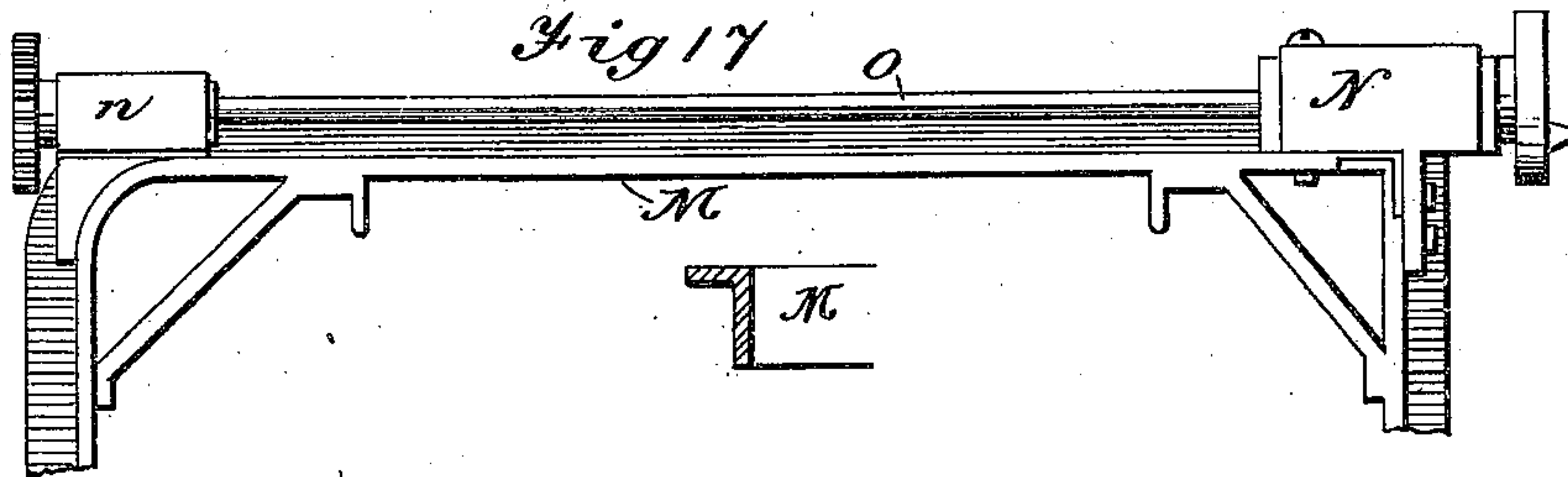
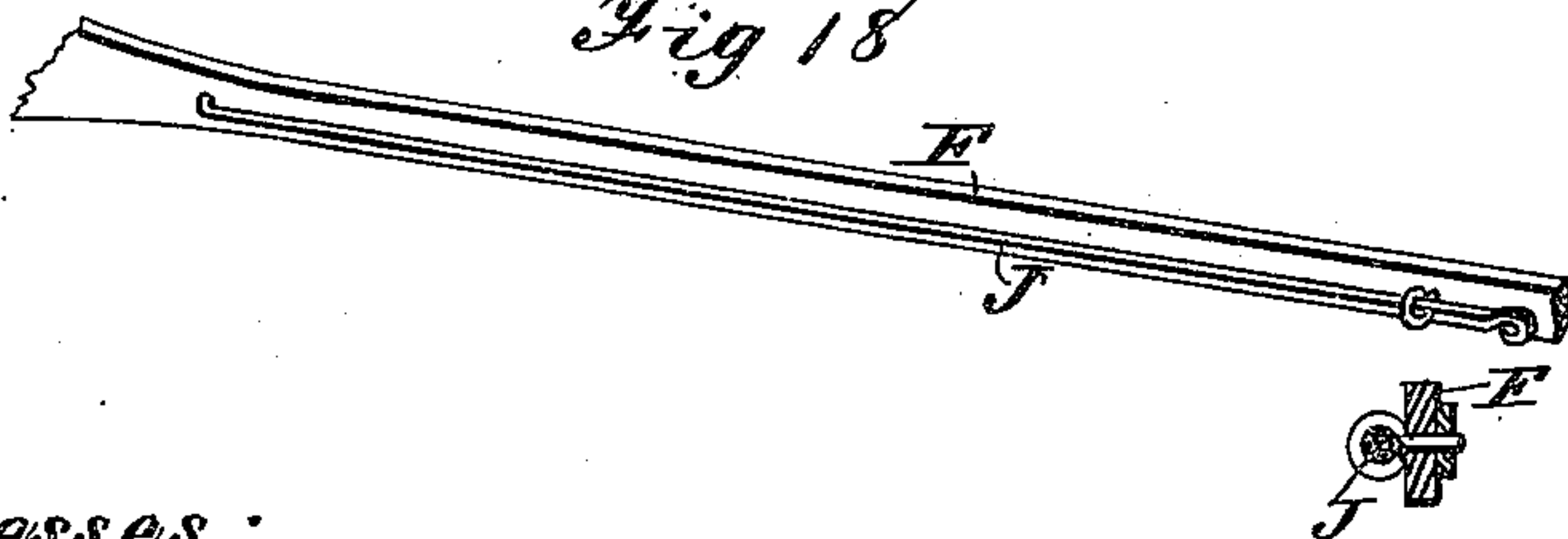


Fig 18



Witnesses;
Harry C. Clark.
M. C. Stallings

Inventor.

James Harris
by H. W. Readler
his Attys.

UNITED STATES PATENT OFFICE.

JAMES HARRIS, OF JANESVILLE, WISCONSIN.

IMPROVEMENT IN MOWERS.

Specification forming part of Letters Patent No. **200,289**, dated February 12, 1878; application filed April 1, 1876.

To all whom it may concern:

Be it known that I, JAMES HARRIS, of Janesville, in the county of Rock and State of Wisconsin, have invented new and useful Improvements in Harvesters; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The invention consists, mainly, first, in the combination, with a turning drag-bar, of a sectional lever, having a detachable or folding portion; and, second, in the combination, with the knife-bar, of a sliding gravity-hook, for retaining the knife-bar in place when the bar is folded.

It further consists in certain other combinations and certain details of construction, which, in connection with the foregoing, will be fully described hereinafter.

In the drawings, Figure 1 represents a side elevation of my improved harvester with the cutter-bar in section; Fig. 2, a plan view with the cutter-bar folded; Fig. 3, a rear-end elevation of the same; Fig. 4, view, in elevation, of the tongue-iron and its connections; Figs. 5, 6, and 7, views of the pitman-joint; Fig. 8, a sectional elevation of the folding lever; Figs. 9, 10, and 11, views of the sliding hook for holding the cutter-bar; Figs. 12, 13, 14, 15, and 16, views of the clutch mechanism; Fig. 17, a partial plan view of the frame reversed; and Fig. 18, a perspective view of the rod for holding the cutter-bar in its folded position.

To enable others skilled in the art to make and use my invention, I will now proceed to describe fully its construction and manner of operation.

For convenience and clearness of description, the separate mechanisms will be described under different heads, as follows: First, the drag-bar and the devices which make it capable of turning when the cutter-bar is folded; second, the folding lever and its combination with the turning drag-bar; third, the knife-bar, and the sliding hook which holds it in place when the cutter-bar is folded; fourth, the variable shoe or runner; fifth, the pitman-joint; sixth, other details of construction.

First. The drag-bar and the devices which

make it capable of turning when the cutter-bar is folded: A, Figs. 1 and 2, represents a standard or arm, rigidly secured in any proper manner to the tongue or frame of the harvester, which extends outward therefrom at right angles, as shown, and is provided at its outer end with an eye or socket adapted to receive and hold the eyebolt *a*, Fig. 1^a, having a bearing-shoulder, *a*¹, washer *a*², and a fastening-pin, *a*³, as shown.

B represents a bar or plate, forming the drag-bar proper, which is loosely held at its front end by the eyebolt *a* in such manner as to permit its rear end to have free vertical movement, and is provided at its rear end with standards or ears *b*, having bearings, as shown. B' represents a bar or shoe, which is provided at its front end with a horizontal socket and with the projecting arm or standard *b*¹, and at its rear end with a suitable recess for holding the inner end of the cutter-bar. *b*² represents a pivot-pin, by means of which the shoe and drag-bar are united.

C represents a lever, and C' a rack, adapted to hold the lever in any desired position, the special construction of both of which will be hereinafter described. *c* represents a connecting-bar, by means of which the lower end of the lever is united to the upper end of the standard or arm *b*¹, as shown.

D, Fig. 1 and Fig. 1^b, represents a casting, suitably secured to the shoe at any proper point, which is provided with the ear or standard *d*, having a convex projection, *d'*, as shown.

E, Figs. 2 and 2^a, represents a casting suitably secured to the main frame at any proper point, which is provided with a similar convex projection, *e'*, as shown.

F represents a brace-bar, constructed of proper length and suitable material, which is provided at its ends with concave recesses adapted to bear upon the convex projections of the castings, before described. The opposite faces of the bar are also made convex, as shown.

f represents a bolt, adapted to project through proper openings in the ends of the brace-bar and the castings, against which they bear, which is provided with any suitable shank, but with a head having a concave face

upon its inner side, adapted to bear against the corresponding surface of the brace-bar, as shown. This bolt is secured by nuts in any proper manner.

The operation of these parts is substantially as follows: The drag-bar, by means of its construction, is adapted to have a double movement—that is, it may be adjusted at its rear end in a vertical direction, for the purpose of tilting the shoe to roll the cutter-bar, or it may be turned on a horizontal axis, to permit the rigidly-attached cutter-bar to be folded.

The operation of tilting or rolling the cutter-bar has been described in an application coincident with this, and it will not be referred to in detail here.

The operation of turning will be readily understood. When the cutter-bar is folded, the shoe and drag-bar turn freely with it, this movement being permitted at one end by the eyebolt *a*, which turns freely in its socket, and at the other by the pivot-bolt of the brace-bar and casting. By means of the construction described it is possible to locate the actuating-lever at one end, out of the way of the drive-wheel. It is possible, also, by means of this special construction, to cause the central parts, by proper adjustment of the lever, to lie close together, so as to occupy little space in turning.

Second. The folding-lever and its combination with the turning drag-bar: *C*, Figs. 1, 2, and 8, represents a lever attached to the turning drag-bar, near its front end, which is adapted, as before stated, to adjust the rear end of the drag-bar for the purpose of rolling the cutter-bar. *c*¹ represents its shank or main portion, suitably pivoted at the proper point to the rack-casting *C'*, and attached at its lower end to the adjustable connecting-rod *c*, as shown.

*c*² represents an opening for holding the spring-bolt *c*³, which is adapted, when free to act, to press the projection *c*⁴ of the lever into the proper recess of the rack-casting, and securely hold it against accidental displacement.

*c*⁵ represents a bend in the upper part of the lever, by means of which its upper portion, attached thereto, is inclined into a convenient position for operation by the driver. *c*⁶ represents a socket, and *c*⁷ an inclined face, forming the termination of the shank or main portion. *c*⁸ represents the handle or upper portion of the lever, consisting of a suitably-shaped bar, provided at its lower end with ears, by means of which and a suitable pivot-pin it is hinged to the socket of the shank. *c*⁹ represents a spring-bolt, provided at its lower end with a double-inclined face, adapted to engage with the corresponding face *c*⁷ of the shank when the handle of the lever is brought to its proper position, and also to release itself automatically when force is exerted upon the lever to fold it.

C' represents the rack, consisting of a casting of any proper form, rigidly secured to the

drag-bar, which is provided with a proper slot for guiding and holding the spring-bolt *c*³, and also with a series of teeth adapted to hold the lever in any desired position in the usual well-known manner. This casting, it will be observed, is strongly secured to the drag-bar, and is so located as to most advantageously take the strain incidental to the contact of the hinged portion of the lever with the frame when the cutter-bar is folded.

The operation of these parts is substantially as follows: The lever is adjusted in either direction for rolling the cutter-bar up or down, and is held in any desired position by means of the rack-casting and the spring-bolt. When the cutter-bar is folded and the drag-bar consequently turned, the lever is caused to fold itself automatically, as shown in Fig. 2, by the contact of its hinged end with the frame, or some relatively-fixed portion of the harvester, the spring-bolt disengaging itself from the termination of the shank without attention of any kind. When the cutter-bar is unfolded again the lever may be restored to its normal condition by simply turning the hinged part back to its place, when the spring-bolt will unite the two parts together.

Third. The knife-bar and the sliding hook which holds it in place: *G*, Figs. 9 and 10, represents the knife-bar, of the usual well-known or other proper construction, which is held by the finger-bar *g* and the operating-pitman, in the usual manner. *g*¹ represents a casting secured to the finger-bar, near its inner end, which is provided upon its bearing-face with a recess, *g*², located at an angle to the line of the movement of the knife-bar, as shown. *g*³ represents a shoulder projecting into the recess, which is adapted to limit the downward movement of the sliding hook. *g*⁴ represents the sliding hook, consisting of a plate or bar adapted to move in a longitudinal direction in the recess, and provided at one end with the hook proper *g*⁵, and at the other with the projection *g*⁶, adapted to strike against the limiting-shoulder of the recess at the proper time and check further movement. *g*⁷ represents a stud or pin projecting at right angles from the face of the hook, by means of which it may be moved by the hand, if desired.

The operation of these parts is as follows: When the folding of the finger-bar takes place, the knife-bar, unless specially held, is free to slip down and cause trouble. With the construction described, however, this difficulty is avoided. The sliding hook, moving down its inclined recess in advance of the knife-bar, and projecting into the line of the movement of the latter, consequently furnishes a stop, which arrests its movement and holds it securely in place.

Fourth. The variable runner: *H*, Figs. 1, 2, and 3, represents a runner, consisting of a suitable metal plate, which, at its front end, is so bent as to hook over the socket of the joint, and also, at its rear end, is bent

in such manner as to form a right-angled termination, as shown, the vertical part being provided with a series of openings, by means of which it may be secured to the casting at different heights. By means of the construction described, the front end of the shoe is held at the joint between the shoe B' and the drag-bar, and is thus adapted to furnish a bearing-surface for all that part which comes in contact with the ground. The construction of the front end is such, also, that the shoe may be held without other fastening at this point; but, if desired, other fastenings may, of course, be used. It will be observed that the rear end of the drag-bar B projects rearward beyond the front end of the shoe, and thus effectually protects the same from being caught in its movement over the ground.

Fifth. The pitman-joint: I, Figs. 5, 6, and 7, represents the pitman, which receives its proper reciprocating movement in any suitable manner from any proper source. i^1 represent spring-bars, which form that end of the pitman which is attached to the knife-bar, one of which is provided upon its inner face with a convex projection, i^1 , and the other upon its adjacent face with a concave recess, i^2 , as shown. i^3 represents a disk, rigidly attached to the knife-bar in any proper manner, which is made semi-spherical in form, so as to be adapted to rest between the corresponding faces of the spring-arms, as shown. i^4 represents a securing-bolt, which is adapted, by means of its nut, to draw the spring-arms closely together, and clamp the intermediate disk of the knife-bar. i^5 represents a nut-lock, held in place by the outer nut i^6 , by means of which the inner nut is prevented from turning.

Sixth: The rod for holding the cutter-bar when folded: J, Figs. 2, 3, and 18, represents a rod adapted to properly hold the cutter-bar when in its folded position, which is loosely pivoted at one end to the brace-bar, and held at the other by means of a removable eyebolt, as shown. When it is desired to use the same, the bolt is removed from its place in the brace-bar by unscrewing its nut, and then the rod is attached to the cutter-bar by inserting its shank in the proper opening j , as shown, and replacing the nut, this being done without detaching the bolt from the rod. By this means the bar is properly held when folded, and at other times the rod is conveniently carried on the brace-bar without danger of being lost.

It will be observed, also, that when the cutter-bar is folded, as shown in Fig. 3, it will be so united to the brace-bar by the rod J that the three parts may move together independently of the frame, so that if the lifting-lever becomes detached from any cause, these parts may fall to the ground without injury to the rod, which, if secured to the frame, would probably be bent or broken.

K, Figs. 1, 2, and 4, represents the pole of the machine, pivoted in any proper manner to the front end of the frame. This pole is, preferably, attached, however, by means of an in-

termediate casting, k , provided with a suitable bearing-surface for the rear end of the pole, and ears, by means of which it is hinged to the frame, as shown. k^1 represents an iron bolted to the rear end of the pole, which, extending in a rearward direction, is provided, at or near its rear end, with a stud, k^2 , as shown.

L represents a casting, secured to the frame in any proper manner, which serves to support the driver's seat, as shown, and is provided with a pendent arm or ear, l , Fig. 4, having an opening adapted to hold the stud of the arm, as shown.

l^1 , Figs. 1 and 2, represents a catch, adapted to hold the end of the raising-lever l^2 , as shown. By means of this construction the arm is so secured as to lock, upon the inside of the front beam of the frame, the pole, which is pivoted upon the outside.

M, Figs. 2 and 17, represents the frame of the harvester, consisting of a piece of angle-iron, of suitable length, bent into the proper quadrangular form, and secured at its adjacent ends by riveting or other proper means.

N represents a journal-box, provided with angular bearing-surfaces, as shown, which are adapted to cover the joint in the frame, and unite, either alone or in connection with other means, the adjacent ends together. n also represents a journal-box, located at the opposite end of the frame, and attached thereto in any proper manner.

O represents a shaft, adapted to operate the pitman of the cutter-bar, which is held by the journal-boxes N n , and consequently lies in the angle of the frame, as shown.

Some of the advantages of the described construction are as follows: By making the frame of angle-iron, great strength and rigidity are obtained with little material, and also convenient vertical and horizontal surfaces are furnished, to which the auxiliary parts may be readily attached.

By locating one of the journal-boxes at the joint, and providing it with angular bearing-surfaces, as described, the frame is greatly strengthened at its weakest point. The location of the shaft, also, within the angle of the frame is advantageous, as the parts are compactly arranged, and space is economized.

P, Figs. 12, 13, 14, 15, and 16, represents a clutch-box, rigidly fixed to the main shaft or axle, which is provided on its inner periphery with the usual series of clutch-teeth p , adapted to engage with the spring-pawl upon the main wheel, in the usual well-known manner.

p' represents an auxiliary series of clutch-teeth, located on the inner vertical face of the clutch-box, which teeth are arranged in a position the reverse of that of the clutch-teeth p , and hence are adapted to give, when in operation, revolution to a pawl in a forward direction.

This inner series of clutch-teeth is adapted, when the machine is used as a reaper, and the main wheel is consequently removed, to give movement to a chain-wheel adapted to

drive the rake, as shown in Fig. 16, this wheel being held in contact with the clutch-teeth by a suitable spring device, adapted to yield when the machine is backing, and which may be used to stop the rake by throwing the same out of clutch by means of a lever.

By means of this construction a single casting answers the double purpose of a clutch, for driving the main shaft of the mower, and also for driving the rake of the reaper when the drive-wheels are removed and placed together.

By means of the various details described the construction is simplified, and the efficiency of the harvester increased.

I do not limit myself to the precise construction shown and described. Various modifications may be made without departing from the spirit of my invention. For instance, if desired, the upper portion of the lever C may be detached, when the drag-bar is folded, by removing its pivot-pin; or it may be folded parallel with the drag-bar, if desired, instead of at right angles to it; and when this is practiced the devices for making its action automatic may be dispensed with.

Instead of using the spring-bolt, a simple spring may be used to accomplish the same purpose.

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

1. In combination with a turning drag-bar, a sectional lever, having a detachable or folding portion, as described.

2. In combination with the lever C and folding drag-bar B, the shoe B', having arm b^1 , and the connecting-rod c, pivoted to lower end of lever C, and above the drag-bar to the arm b^1 , the construction being such that when the lever is properly operated the arm b^1 and rear end of bar c may be caused to approach the drag-bar, to avoid contact with the wheel in folding, substantially as described.

3. In combination with a folding lever and a harvester-frame, adapted to arrest the movements of the hinged portion of the lever and fold the same, a rack-bar, C', substantially as described, adapted to take the strain when the lever strikes the frame, substantially as described.

4. In combination with the lever portion c^1 , provided with the inclined face c^7 , the lever portion c^8 , provided with the spring-bolt c^9 , having the double-inclined face, as described.

5. In combination with a reciprocating knife-bar, a sliding hook, adapted to act automatically by gravity, to prevent said knife-bar from sliding from its bearings when the cutter-bar is folded, substantially as described.

6. The combination of a sliding hook with a casting having an inclined recess, adapted to guide it into the line of the movement of the knife-bar, substantially as described.

7. The hook having a limiting-projection, in combination with the recess having a limiting-shoulder, as described.

8. In combination with the runner B' and the runner H, the drag-bar B, the rear end of which projects beyond the front end of the shoe and protects the same, as described.

9. In combination with the brace-bar F, the pivoted rod J, attached thereto, substantially as described, the construction being such that when the cutter-bar is folded the brace-bar, cutter-bar, and securing-rod are capable of being moved together independently of the frame.

This specification signed and witnessed this 9th day of March, 1876.

JAMES HARRIS.

Witnesses:

PLINY NORCROSS,
FENNER KIMBALL.