

(No Model.)

3 Sheets—Sheet 1.

J. D. WILBER.

MOWING MACHINE.

No. 254,753.

Patented Mar. 7, 1882.

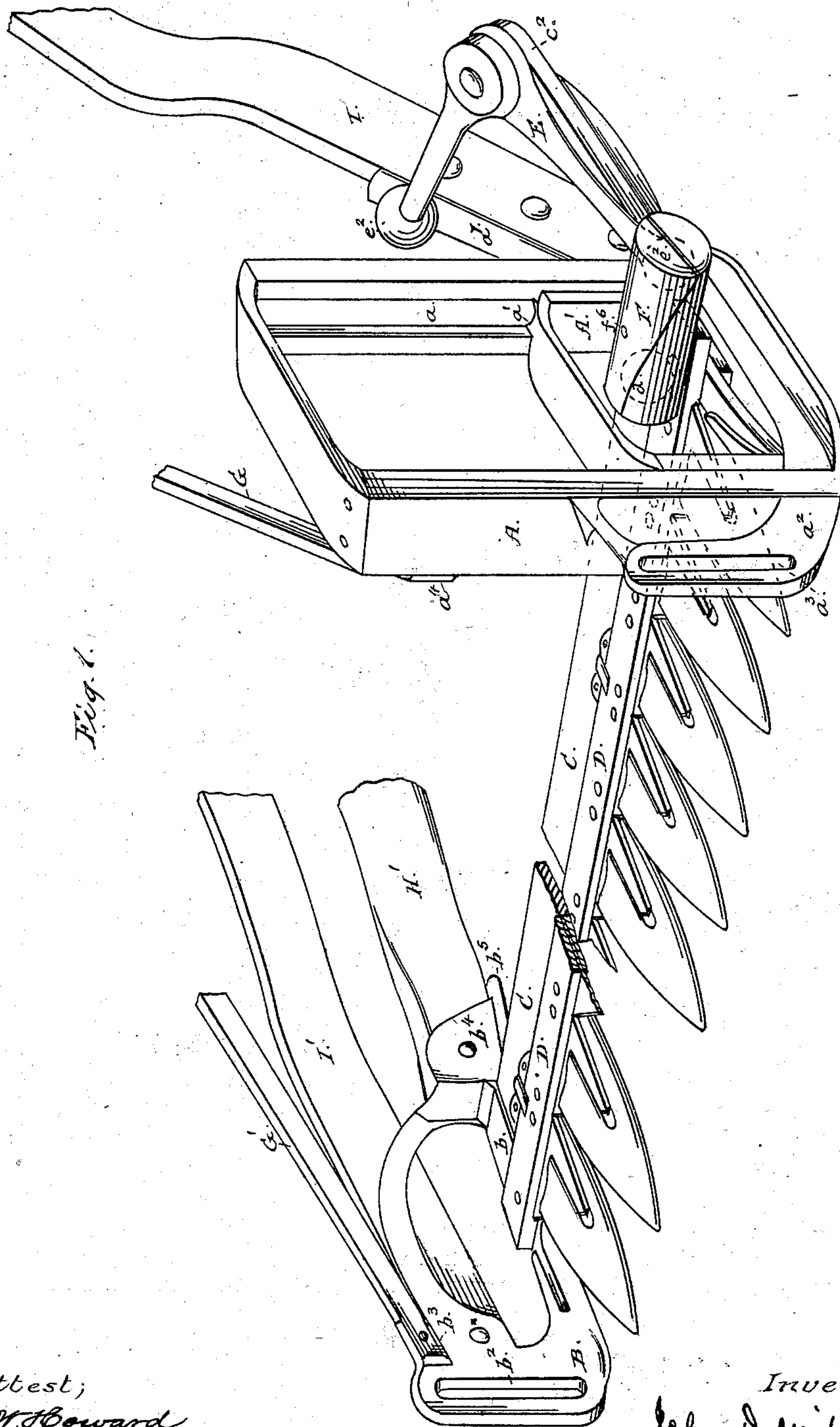


Fig. 1.

Attest;
G. W. Howard
J. O. Clark.

Inventor,
John D. Wilber
per Dyer & Wilber
Atty.

(No Model.)

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Fig. 2.

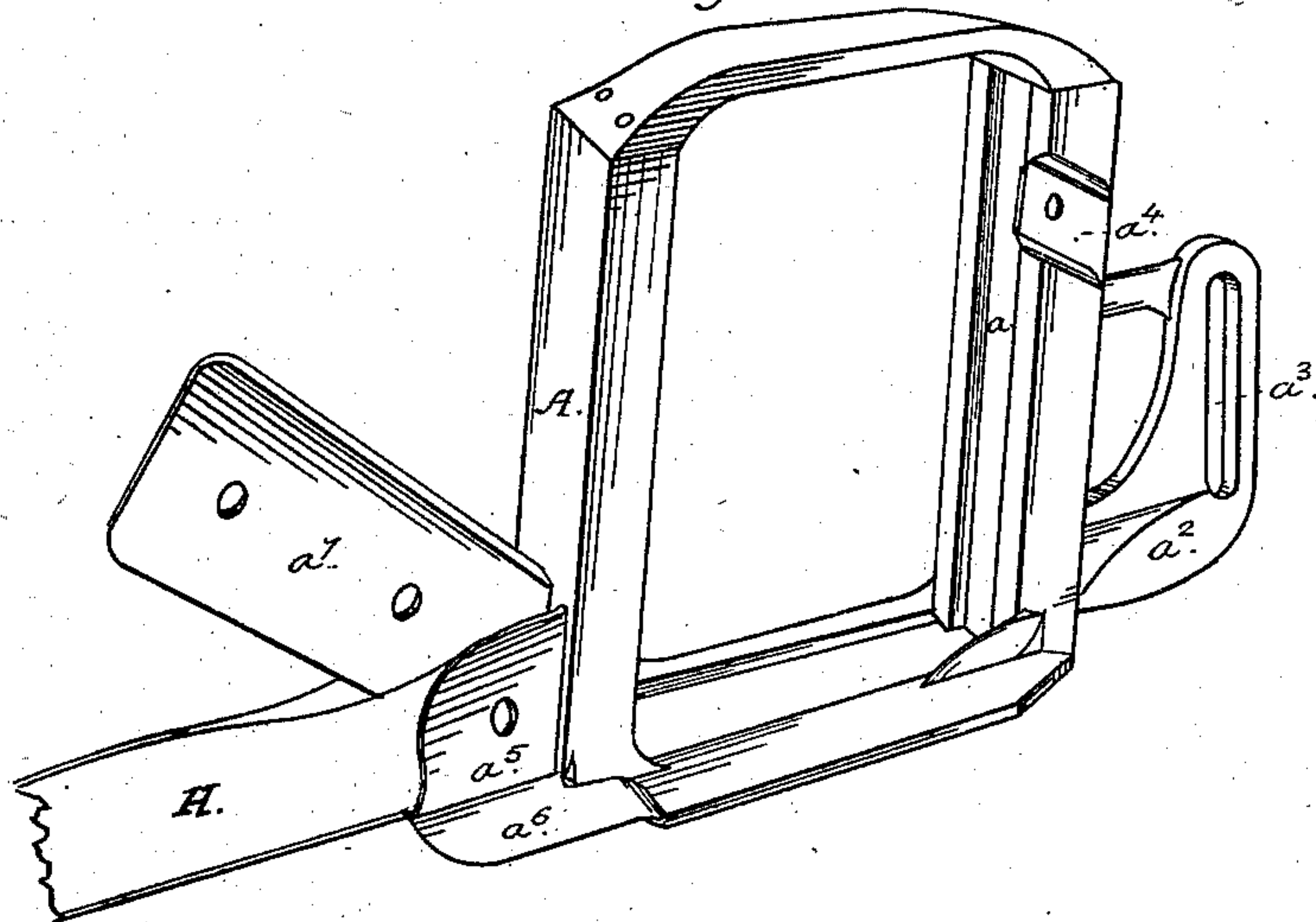


Fig. 3.

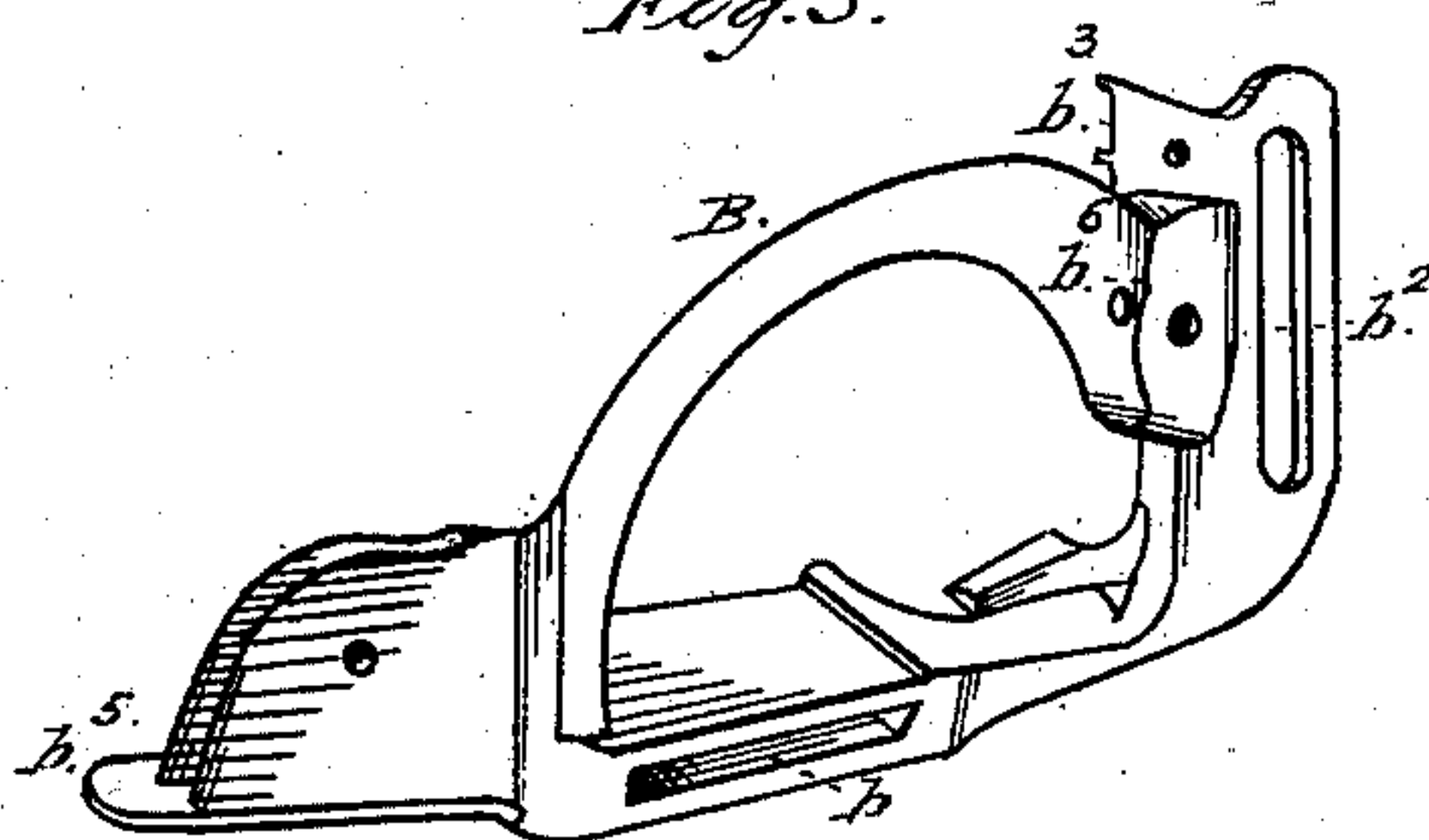
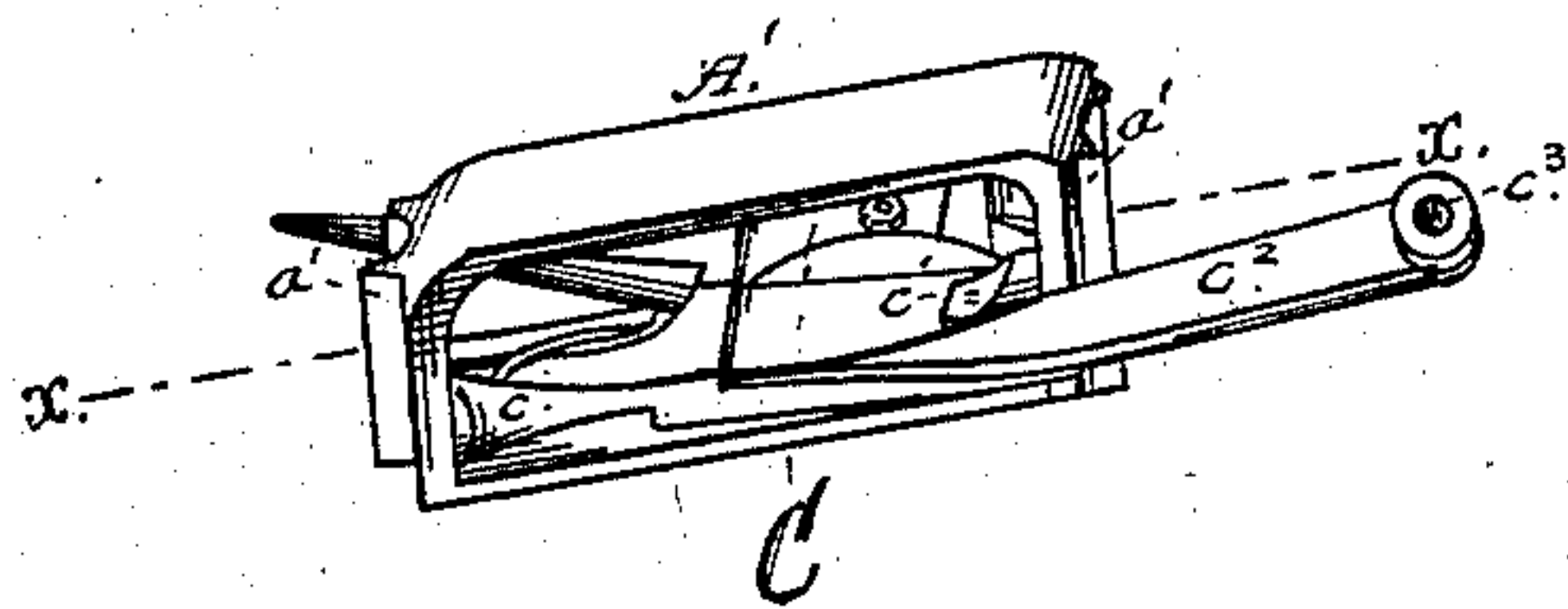


Fig. 4.



Attest;
F. W. Howard
J. B. Clark

Inventor;
John D. Wilber
by J. D. Wilber
Atty.

(No Model.)

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Fig. 5.

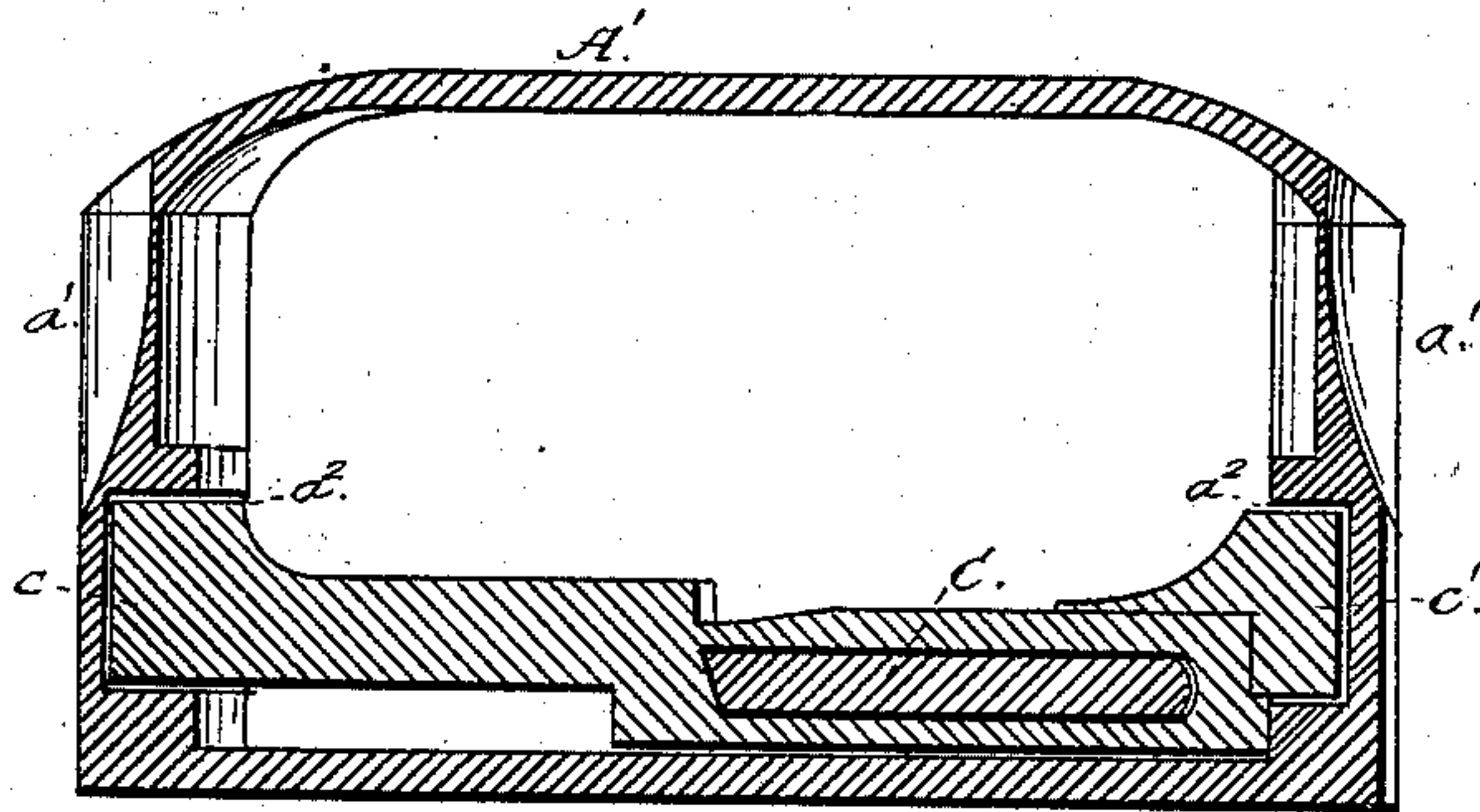


Fig. 6.

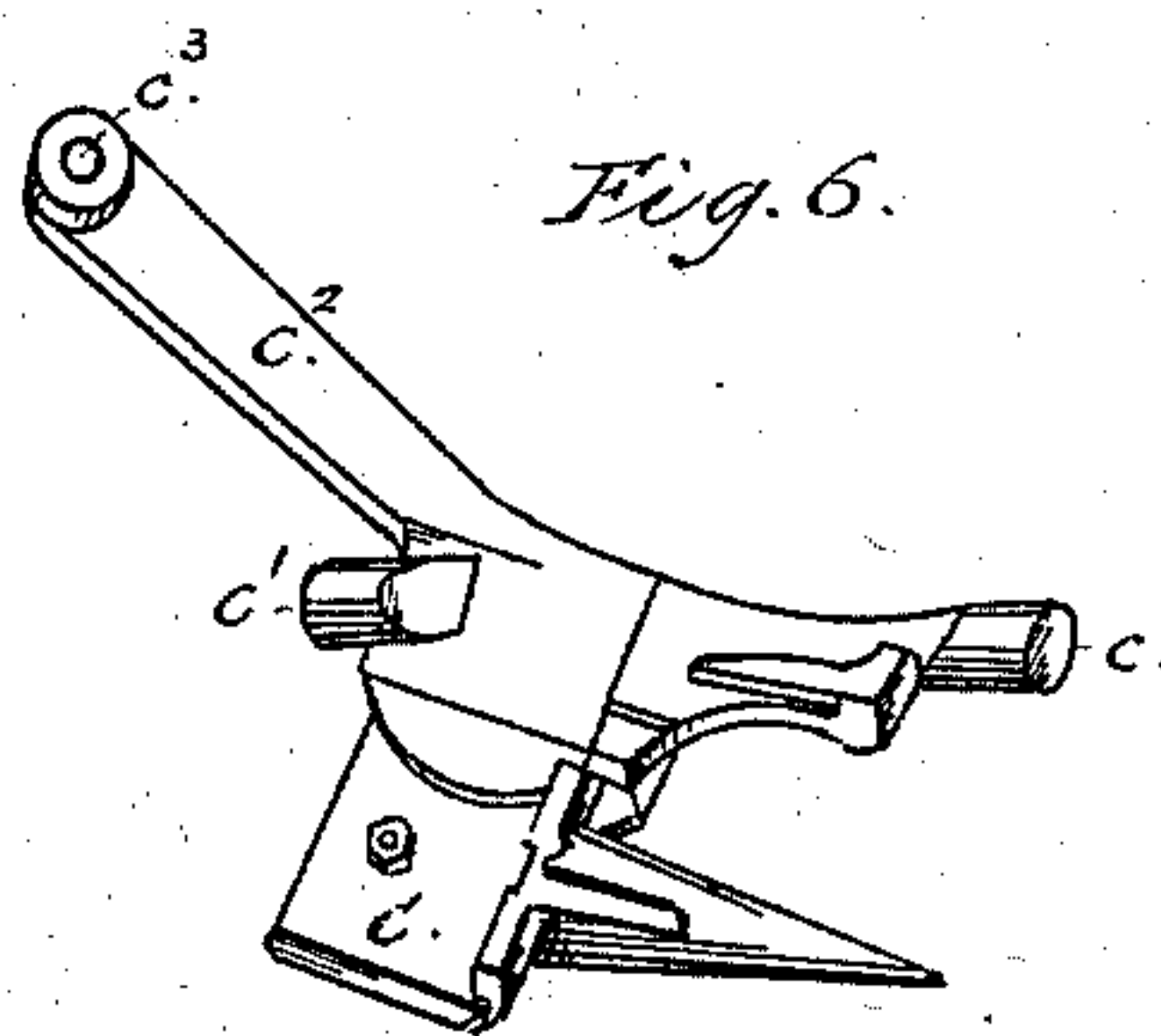


Fig. 7.

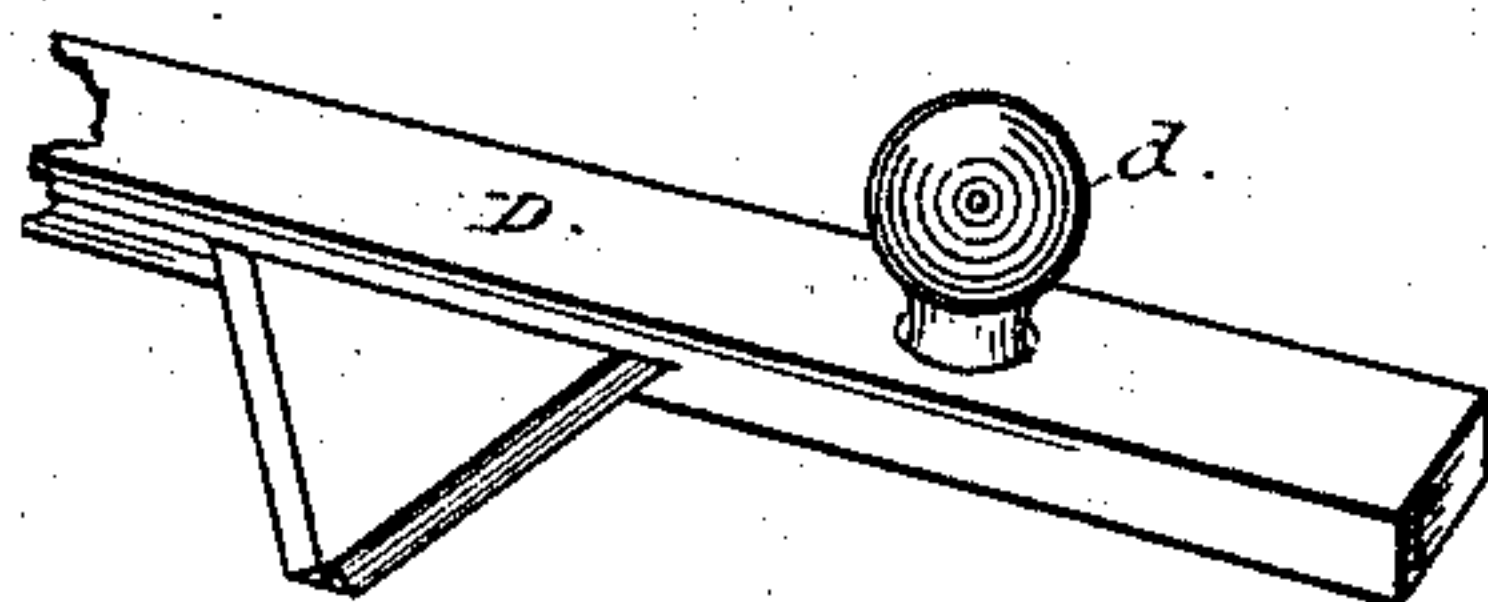


Fig. 9.

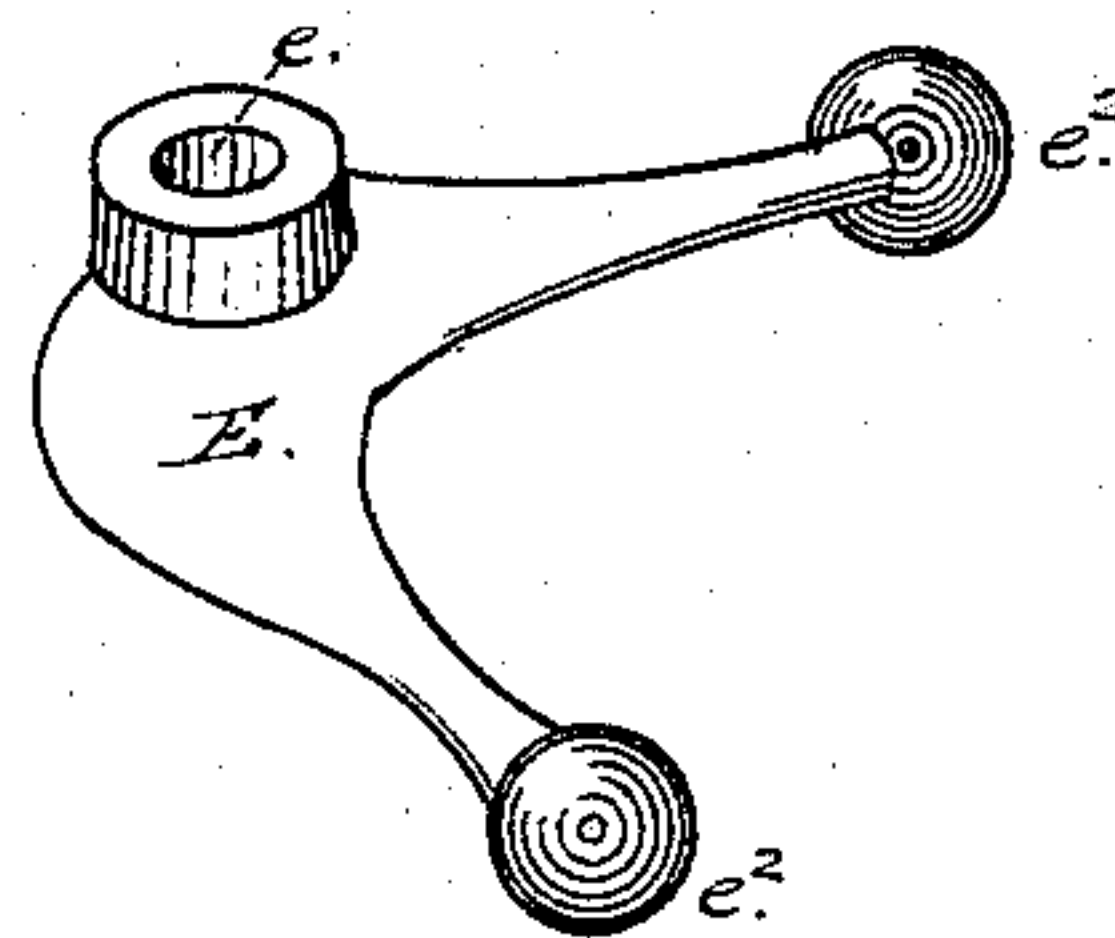
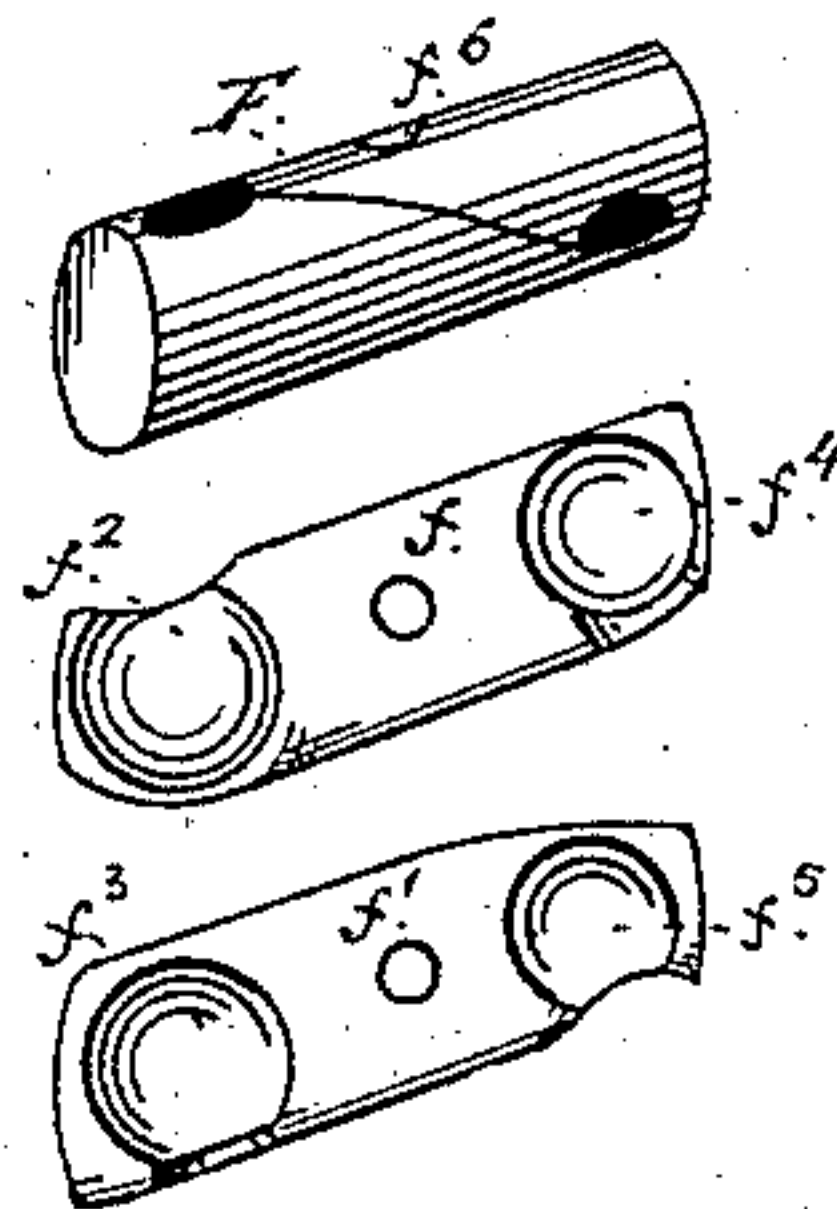


Fig. 8.



Attest;
H. W. Howard
J. E. Clark

Inventor;
John D. Wilber
by J. D. Wilber
Attys.

UNITED STATES PATENT OFFICE.

JOHN D. WILBER, OF TOWANDA, PENNSYLVANIA.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 254,753, dated March 7, 1882.

Application filed December 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. WILBER, of Towanda, in the county of Bradford and State of Pennsylvania, have invented new and useful Improvements in Mowing-Machines; 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.

My invention relates to improvements in that class of mowing-machines wherein the cutting-knife and finger-bar are arranged in front of the transporting and driving wheels, and the draft-pole is applied to the axle in such a manner as to obtain a direct central draft; and these improvements consist, first, in the novel construction of the finger-bar and its novel arrangement with relation to the left-hand shoe and a vertically-sliding block provided within said shoe; secondly, in the novel construction of the left-hand shoe and its novel arrangement with relation to the finger-bar and a vertically-sliding block, to which the finger-bar is pivoted, provided within said shoe; thirdly, in the novel construction of the bell-crank lever, as also the means provided for its connection with the cutting-knife, and their novel arrangement with relation to the finger-bar and said cutting-knife; fourthly, in the novel construction of the right-hand shoe and its novel arrangement with relation to the finger-bar and the supporting-frame of the machine; fifthly, in the novel construction and arrangement upon the shoes of means for making a proper clearance between the cut and uncut grass; sixthly, in the arrangement upon the shoes of a novel means for preventing the cut grass accumulating and wedging against the axle of the machine; and, seventhly in the various novel combinations of the above-mentioned parts with one another, all as will be hereinafter more fully set forth and claimed.

To enable others skilled in the art to which my invention relates to understand the construction and operation of my improvements, I will now describe the same with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the cutting apparatus and appendages provided with my improvements as adapted to mowing-machines of direct draft; Fig. 2, a perspective view of

the left-hand shoe detached; Fig. 3, a perspective view of the right-hand shoe detached; Fig. 4, a perspective view of the vertically-sliding block, detached, with a portion of the finger-bar; Fig. 5, a vertical sectional view of the sliding block and finger-bar, taken on the line *xx* in Fig. 4; Fig. 6, a perspective view of a section of the finger-bar detached; Fig. 7, a perspective view of the end of cutter-bar connecting with bell-crank lever; Fig. 8, a perspective view of the two parts composing the coupling that unites the cutter-bar and bell-crank lever, and Fig. 9 a perspective view of the bell-crank lever detached.

In the drawings, A represents the left-hand shoe; A', the vertically-sliding block or carriage; B, the right-hand shoe; C, the finger-bar; D, the cutter-bar; E, the bell-crank lever, and F the coupling-connection between the bell-crank lever and cutter-bar.

The left-hand shoe, A, is peculiarly novel in form, as shown, and of proper size and strength to accommodate itself to the work for which it is intended; and it is constructed (as more clearly shown in Fig. 2) so as to have its upwardly and forwardly inclined sides at an angle to its inside face of about fifteen degrees. The forward inclination of said sides is also about fifteen degrees. The object of this construction will be explained hereinafter. Upon the interior of said sides of the shoe the vertical grooves or guideways *a a* are made for the reception of sliding block A'.

The top of the shoe is made removable, as shown, so that this block may be readily placed in position. The sliding block A' is also of peculiarly novel form, as shown, and of proper size and shape to fit nicely within the inclosing shoe and allow the necessary vertical play to readily accomplish the work to which it is adapted. It is provided upon the exterior of its inclined sides with flanges or guides *a' a'*, (more clearly shown in Fig. 4,) which fit into the grooves *a a* of the shoe. The tops of these guides are scored out, as shown, for providing ready means to lubricate the bearings in the shoe in which the guides move.

Within block A' the finger-bar C is pivotally secured by means of the lugs or trunnions *c' c'*, provided upon the front and rear of said bar and entering apertures *a²* upon the interior

of the inclined sides of said block, arranged at such a distance from its base as to allow the finger-bar to have a slight rocking movement upon its bearings within the block. The construction and arrangement of the finger-bar with relation to sliding block A' are clearly shown in Fig. 5. When the finger-bar is secured in its block or carriage, as set forth and shown, and said carriage placed within its inclosing-shoe, the front of the shoe will be at an angle of about fifteen degrees to said finger-bar—that is to say, the front of the shoe will extend outwardly and away from the finger-bar, while its heel extends inwardly in rear thereof. In other words, the shoe is diagonally arranged with respect to the front of the finger-bar when said parts are in their proper relative positions. The object of this arrangement of the left-hand shoe at an angle to the finger-bar, as also the construction of its sides to incline forward at an angle of about fifteen degrees, is to locate the shoe and sliding block at such an angle with relation to the cutter-bar and the pitman or crank-shaft connecting the mechanism, hereinafter to be described, for operating it with the driving-power of the machine as will permit said mechanism and pitman to accomplish their work in the most effective manner, and yet allow of a free vertical movement of the sliding block and that end of the finger-bar pivoted therein whenever the occasion requires.

By inclining the sides of shoe A forward at an angle of almost fifteen degrees, the sliding block A' on being raised will always be equidistant from the pitman or crank-shaft, and thus allow it to work properly in whatever position the sliding block may be placed. The radius from the crank-shaft, in fact, describes a curve during any upward movement of the sliding block; but the circle is so large that in the six inches (this is in practice about the height necessary to raise the sliding block to accomplish the desired results) the sliding block is elevated the path is so little out of a straight line that it practically answers all purposes to incline the sides of the shoe and sliding block at an angle of about fifteen degrees. This construction also enables the block to move more freely than would be the case if the sides of the shoe and block were made on a slight curve.

The finger-bar is connected with the right-hand shoe, B, by providing said shoe at its base with a horizontal opening, b, of a proper size and shape to receive the end of said bar, and then securing it therein by means of bolts passing transversely through the connecting parts.

The shoes are flat-bottomed, and permit the under surfaces of the finger-bar to rest upon the ground when desired; and for the purpose of adjusting the finger-bar and cutting-knife to any desired height the lead-wheels are intended to be adjustably connected to the fronts of said shoes, the left-hand shoe being provided with a bracket, a², with a vertical slot, a³, and the right-hand shoe with a vertical slot, b², di-

rectly at its end, as shown, to receive said wheels and allow of their ready adjustment as the occasion requires.

Upon the inside of each shoe, and near or at the top of its front, are arranged respectively brackets or supports a⁴ and b³. These brackets are inwardly and upwardly inclined, so that the guide-pieces G G', when secured therein, shall extend inwardly and upwardly toward the center of the axle of the mowing-machine. They should reach about half-way this distance and have their inner ends free and unsecured. These guide-pieces are made of wood of about one-fourth by three-fourths inch, and are designed to take the place of the present steel rods sprung in between the shoes and axle, which are objectionable for many and obvious reasons.

By the above-described arrangement the top of the grass, as it is being cut, is pressed against the free ends of these guide-pieces, and properly kept away from the axle and from wedging against it, as would happen if the steel rods were used in the manner above stated.

Upon the heel, respectively, of each shoe, and in rear of the cutter-bar, are arranged brackets or sockets a⁵ and b⁴, in which are loosely pivoted track-clearers H H', each being simply a strip of wood of the proper size and length to accomplish their purposed work. Also, upon the inside of the shoes, and at the base, respectively, of sockets a⁵ and b⁴, and just in rear of the cutter-bar, are provided the horizontal projections or ledges a⁶ and b⁵, (the construction and arrangement of the ledges are shown in Figs. 1 and 2,) the object of which is to facilitate the clearing of the cut and uncut grass. Without these the cut grass would pass immediately over the cutter-bar and the cut ends engage with the stubble in front of the driving-wheels, the track-clearers proper only operating to press away the tops of the cut grass; but by means of these shelves and the inside faces of the sockets being on an incline, as shown, the cut grass becomes positively separated at these points before reaching the ground.

The left-hand shoe is connected with the frame of the machine by means of the side arm I, which is secured to the shoe by being bolted to a bracket, a⁷, provided at its heel, and arranged at a proper angle, as shown in Fig. 1. The upper end of the side arm is secured in the ordinary way.

The side arm I', which connects the right-hand shoe with the frame of the machine, has its lower end pivotally connected or secured within a socket, b⁶, (this socket is clearly shown in Fig. 3,) with which the shoe is provided at a point in advance of the finger-bar, and in line with and near the axis of its lead-wheel. The upper end of this side arm I intend to secure to the frame of the machine by means for which I have already obtained Letters Patent, numbered 211,122, and dated January 7, 1879.

By securing the side arm in the above-de-

scribed manner to the right-hand shoe I am enabled to overcome the knuckling and twisting of the finger-bar occasioned by the present mode of connection at its heel when coming in contact with any obstacle during the operation of mowing. These side arms should be made of a proper length and curvature to permit the cutting apparatus to occupy its proper relative position with relation to the frame of the machine and the operative parts provided thereon.

I will now describe the mechanism employed for operating the cutter-bar.

Upon the end of finger-bar C, which is pivoted within the sliding block heretofore referred to, there is provided an arm, c^2 , integral therewith, for the purpose of properly supporting the bell-crank lever E. The construction and arrangement of this arm are shown clearly in Fig. 6. The arm extends outwardly and rearwardly from the outer face of shoe A, as shown in Fig. 1, and is of a proper length and incline to permit the bell-crank lever to be arranged properly with relation to its relative position to the cutter-bar and the means employed for connecting it therewith. The bell-crank lever is secured to said arm at its end, which is provided with an opening, c^3 , by means of a bolt passing through an opening, e , at the center of the bell-crank lever and said opening c^3 , and upon which bolt it has a vibrating movement.

The two arms of the bell-crank lever are at right angles to one another nearly, and of the same length, which should be sufficient to allow the end of the arm connecting with the cutter-bar to be directly opposite said bar, while the other end, connecting with the operative mechanism, extends over the side arm I the necessary distance to be properly united therewith.

The operative mechanism with which the bell-crank lever is intended to be used I have already secured Letters Patent for, numbered 211,122, and dated January 7, 1879.

The ends of the arms of the bell-crank lever terminate in a ball or globe, e^2 , as shown in Fig. 9, of the proper size to best accomplish the desired results for which their use is designed.

Directly at that end of cutter-bar D connecting with the bell-crank lever is properly provided a ball or globe, d , similar in size to those upon the ends of the bell-crank lever. The connection between the cutter-bar and bell-crank lever is accomplished by means of the coupling F, as shown. This coupling consists of the two parts $f f'$, into which it is longitudinally divided in such a manner that the openings to the sockets formed by the semi-spherical recesses $f^2 f^3$ and $f^4 f^5$, made upon the interior surfaces of said parts at the points shown, are at right angles to one another, so that the ball upon the cutter-bar can enter the coupling perpendicularly, while the ball upon the connecting-arm of the bell-crank lever shall enter it horizontally. The parts of the coupling are connected together at their centers by means

of a pin, f^6 , as shown, or by any other suitable means. By uniting these parts $f f'$ in the above manner it allows the coupling to connect with the cutter-bar and bell-crank lever in the most satisfactory way for keeping the dirt and grit from working into the sockets and causing unnecessary wear and friction at the most vital and essential points in the machine. When these parts are properly united the recesses f^2 and f^3 and f^4 and f^5 , respectively, will form proper-shaped sockets for receiving the ball upon the cutter-bar and that on the connecting-arm of the bell-crank lever.

The construction of the coupling is clearly shown in detail in Fig. 8 of the drawings, and it should be of a proper length and of a proper distance between the sockets formed within it to allow the bell-crank lever, when connected by it with the cutter-bar, to have the proper reciprocating movements necessary to impart the proper action to the cutter-bar required for effectively cutting the standing grass.

By the above-described construction and arrangement of the bell-crank lever, cutter-bar, and coupling no sliding or lost motion exists between the cutting-knife and the mechanism for operating it, but, instead, a perfect universal motion is obtained, allowing perfect freedom of movement in all directions, covering the arcs of all the different circles required for the necessary action of the cutting-knife during the operation of mowing.

By constructing the left-hand shoe as above described, and providing it with a vertically-sliding block with the end of the finger-bar pivotally secured therein, the finger-bar and cutting-knife are free to rise over rough ground or any obstruction without being affected by the weight of the shoe or the pressure of gearing during the operation of mowing, as has been the case with mowing-machines as heretofore constructed.

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

1. In a mowing-machine, the shoe A, constructed and arranged substantially as described, and provided with a vertically-sliding block, substantially as and for the purposes set forth.

2. In a mowing-machine, the shoe A, provided with a vertically-sliding block, A' , in combination with finger-bar C, pivotally secured within said block and arranged at an angle thereto, substantially as and for the purposes set forth.

3. In a mowing-machine, the combination of the shoe A, provided with vertically-sliding block A' , and finger-bar C, provided with arm c^2 , and pivotally secured within block A' , substantially as and for the purposes set forth.

4. The bell-crank lever E, provided with balls e^2 at the ends of its arms, as described, in combination with finger-bar C, provided with arm c^2 , cutter-bar D, provided with ball d , and coupling F, adapted to receive the ball

upon the end of the bell-crank lever at a right angle to that upon the cutter-bar, substantially as and for the purposes set forth.

5 The combination, in a mowing-machine, of the shoe A, vertically-sliding block A', finger-bar O, provided with arm c^2 ; bell-crank lever E, secured pivotally upon said arm, and having its arms terminating in the balls e^2 , cutter-bar D, provided with the ball d , and the coupling F, connecting said cutter-bar and bell-
10 crank lever, the several parts constructed, arranged, and adapted to operate substantially as set forth and shown.

6. In a mowing-machine, the shoe B, provided with bracket b^6 , said bracket being arranged at a point in advance of the finger-bar

C, in combination with side arm I', pivotally secured within said bracket, as and for the purposes set forth.

7. In a mowing-machine, the shoes A B, provided with the horizontal ledges a^6 and b^5 , arranged respectively in rear of the cutter-bar and at the base of the sockets a^5 and b^4 , with which said shoes are provided, substantially
25 as and for the purposes set forth.

This specification signed and witnessed this 19th day of September, 1881.

JOHN D. WILBER.

Witnesses:

E. S. HILLIS,

JAMES H. WEBB.