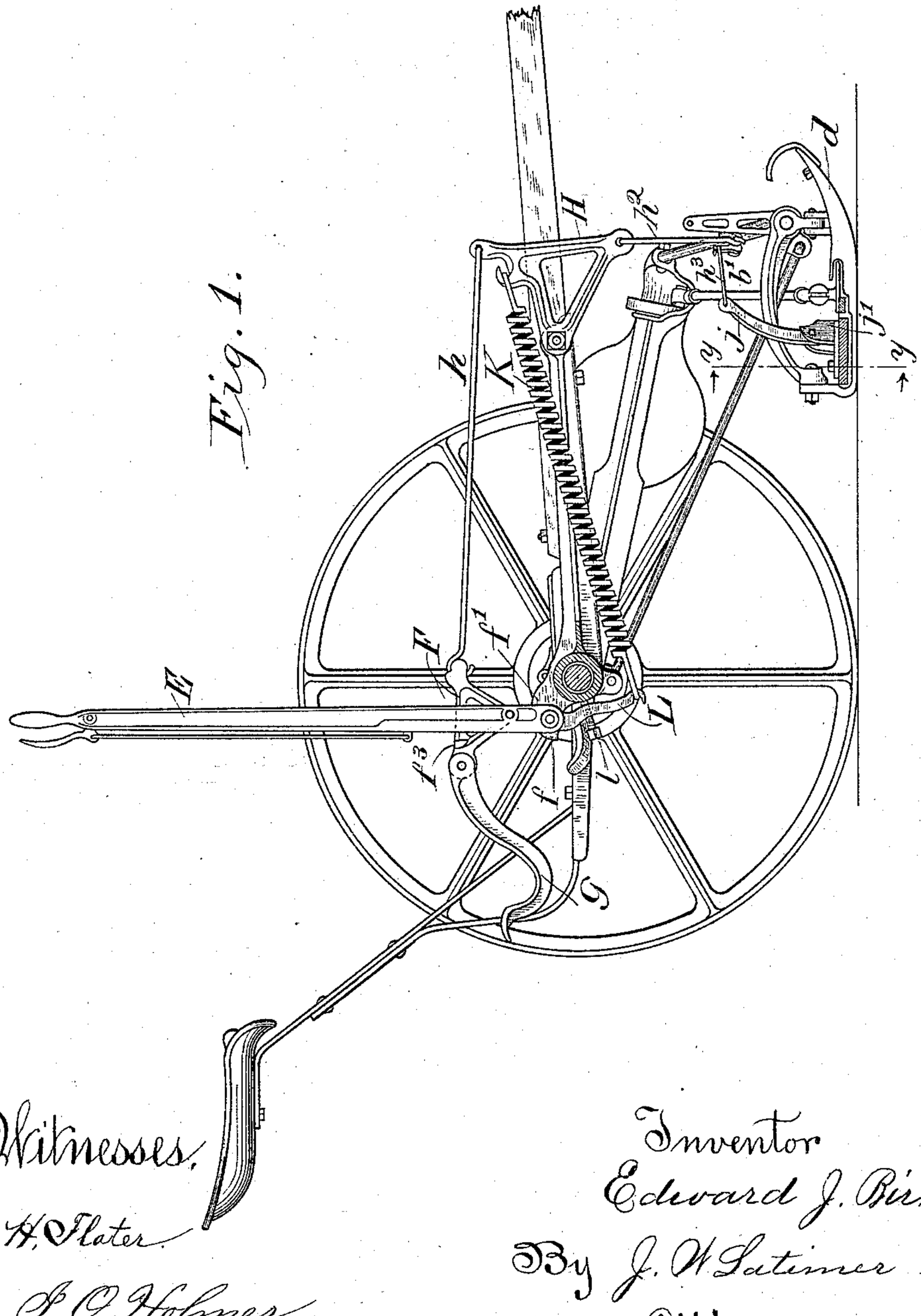
(No Model.) 4 Sheets—Sheet 1.

E. J. BIRKETT.

MOWING MACHINE.

No. 547,411. Patented Oct. 8, 1895

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

E. J. BIRKETT.

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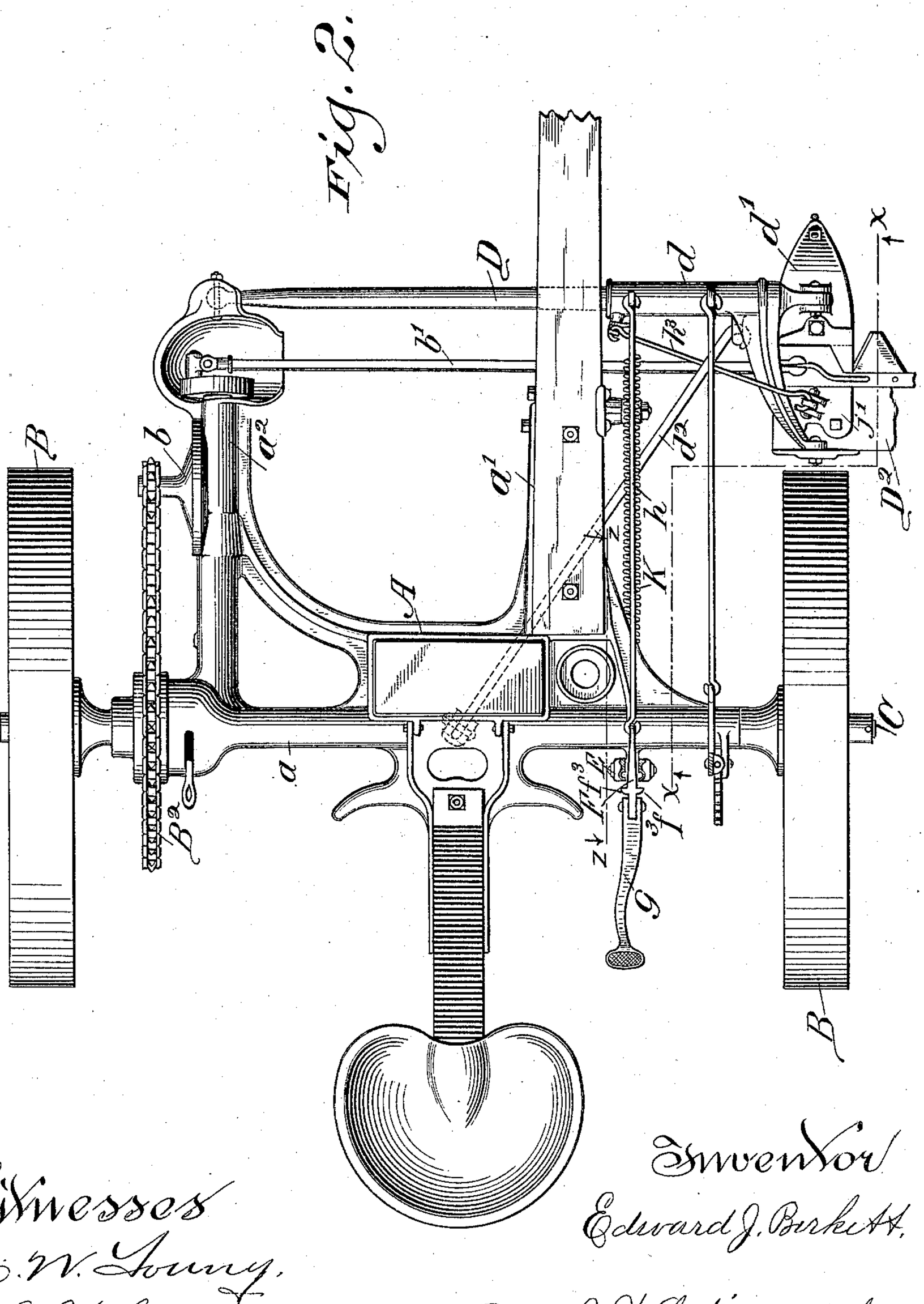
Fig. 2.



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E. J. BIRKETT.

MOWING MACHINE.

No. 547,411. Patented Oct. 8, 1895.

Fig. 3.

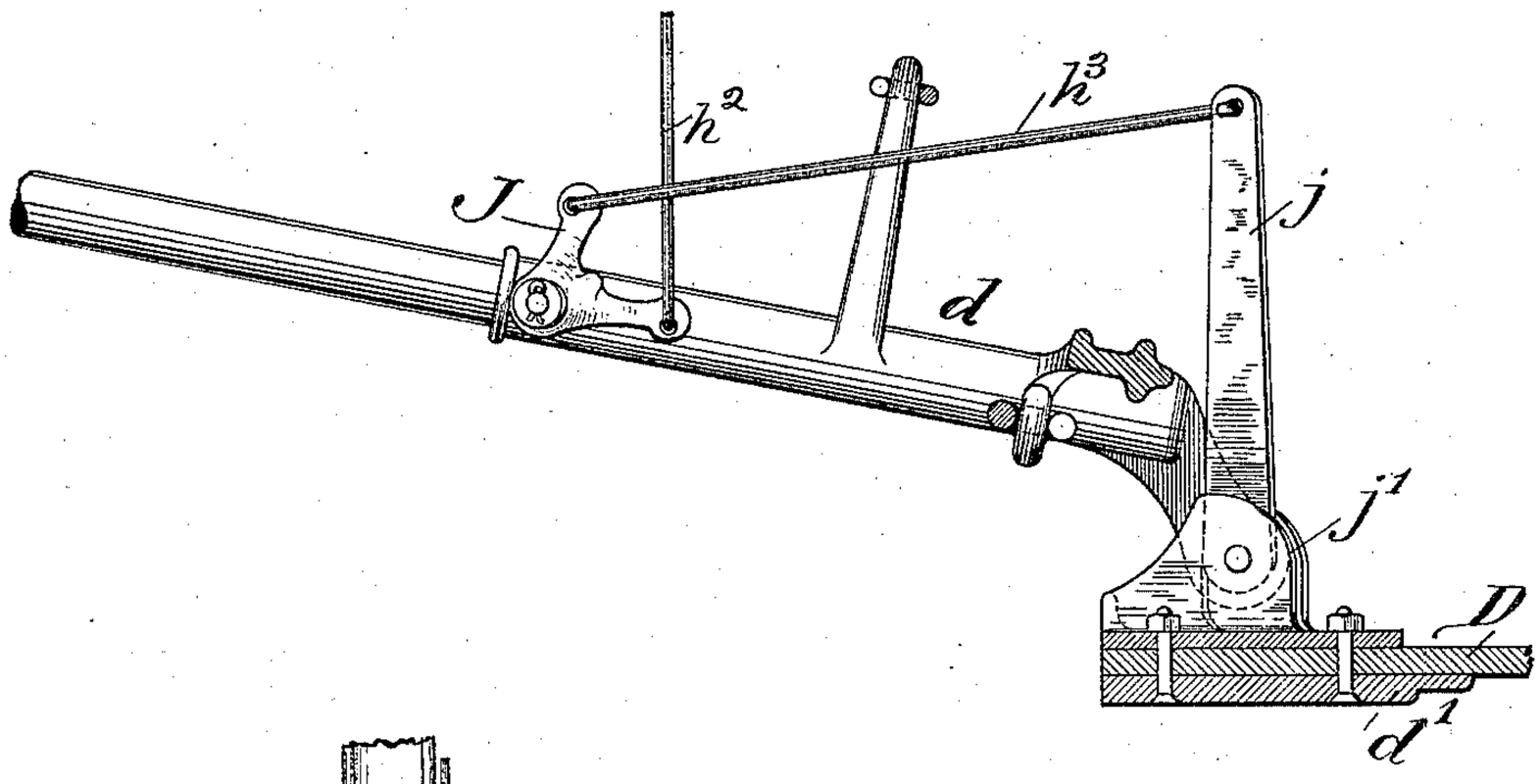
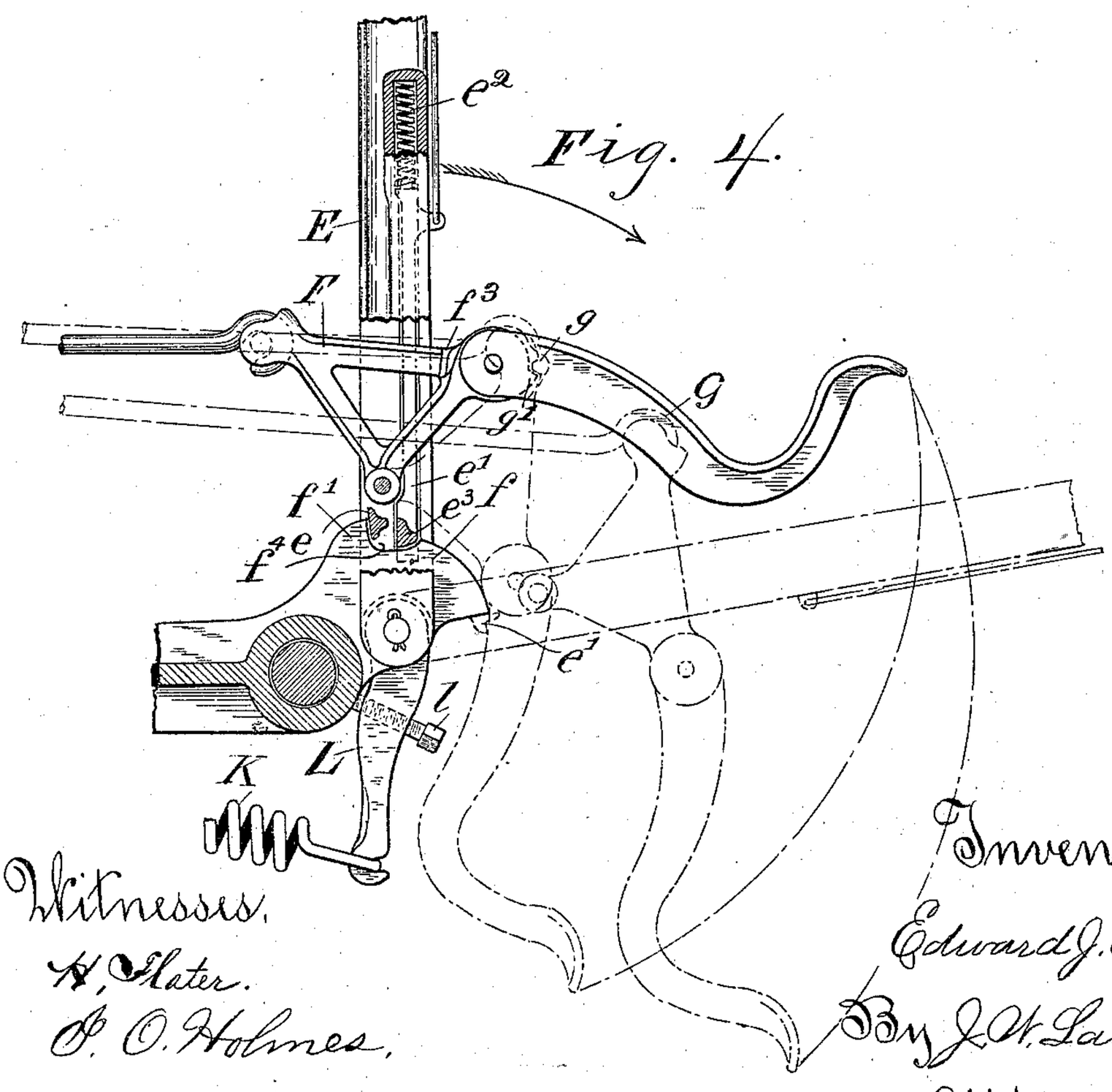


Fig. 4.



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(No Model.)

4 Sheets—Sheet 4.

E. J. BIRKETT.

MOWING MACHINE.

No. 547,411. Patented Oct. 8, 1895.

Fig. 5.

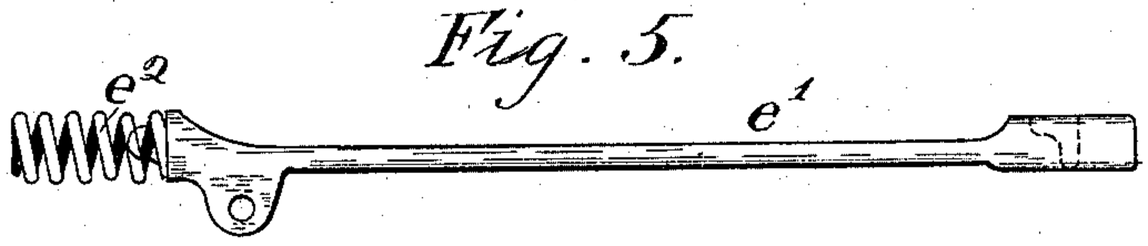


Fig. 6.

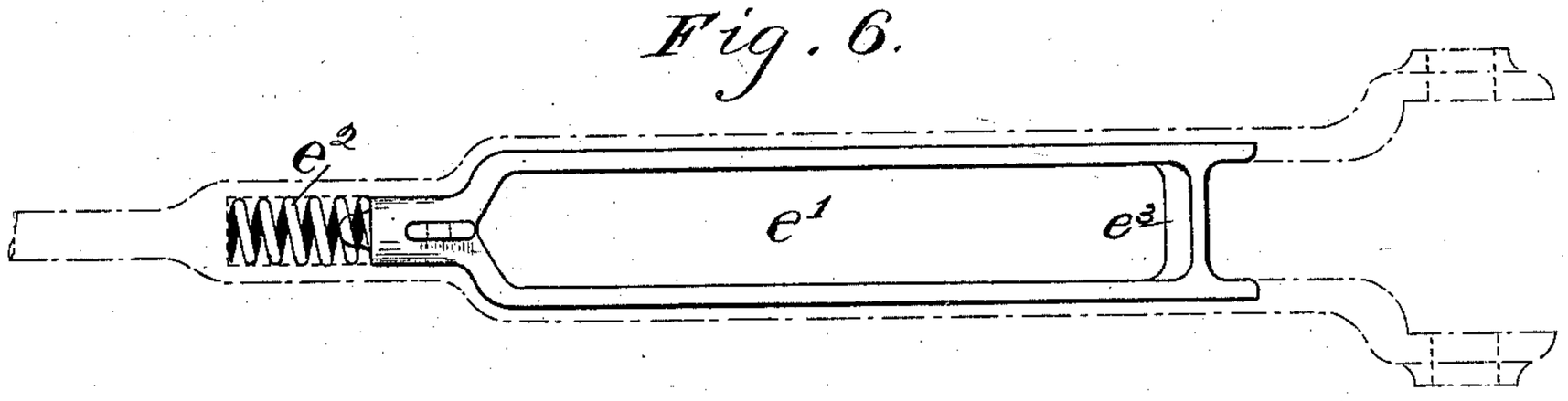
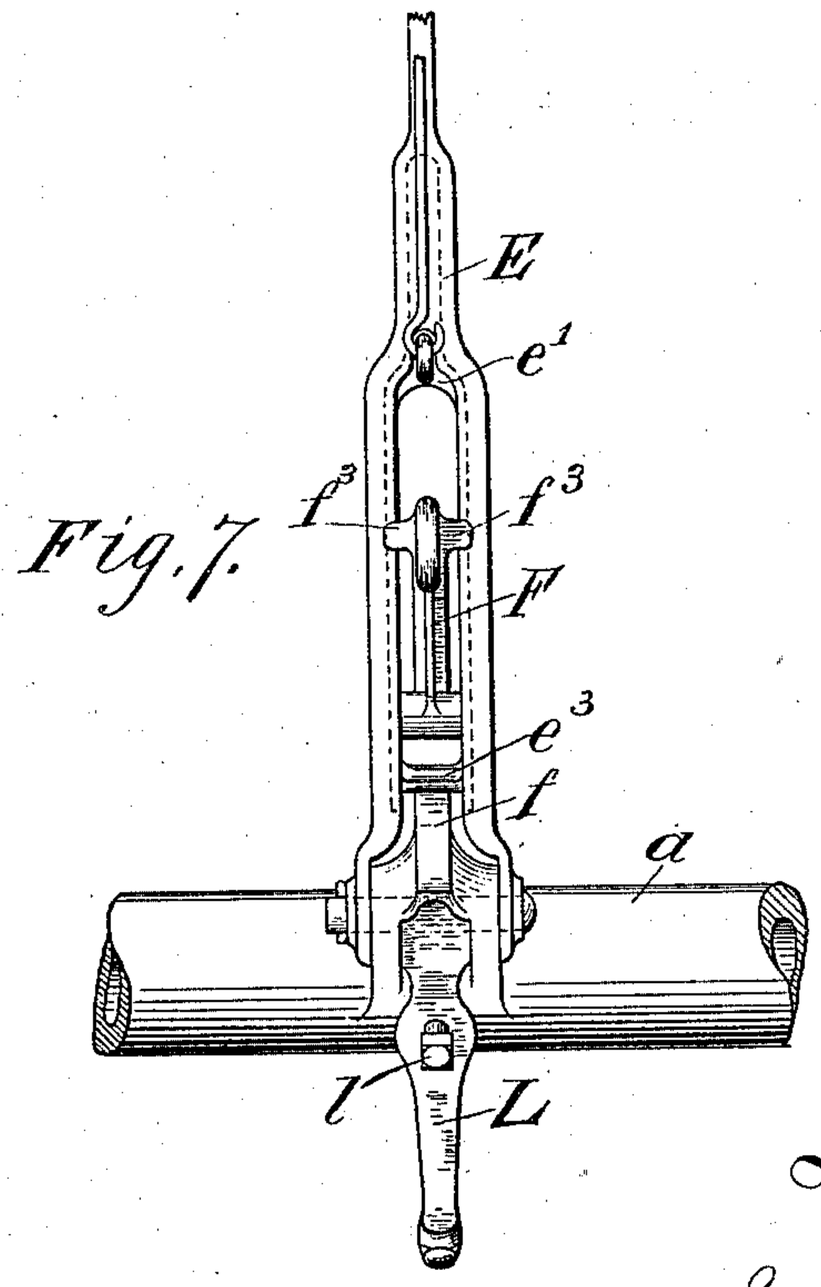


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD J. BIRKETT, OF MILWAUKEE, ASSIGNOR TO THE MILWAUKEE HARVESTER COMPANY, OF MILWAUKEE COUNTY, WISCONSIN.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 547,411, dated October 8, 1895.

Application filed August 8, 1894. Serial No. 519,777. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. BIRKETT, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Mowing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to means adapted to facilitate the lifting of the cutting apparatus of a mowing-machine and for floating it over the surface of the ground while mowing.

It consists, essentially, of a novel arrangement and construction of the hand and foot levers and the parts that make up the lifting and suspension mechanism of a mowing-machine, the foot-lever being adapted to be operated independently or in unison with the hand-lever, and of the elastic connection between the lifting mechanism and the frame, arranged to assist in the lifting of the finger-bar by the levers and to improve the floating of the cutting apparatus over the surface of the ground.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a side elevation and partial vertical section on line *x x*, Fig. 2, of a mowing-machine embodying my improvements. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged vertical section on line *y y*, Fig. 1, viewed from the left, showing a portion of the coupling-arm, the inner end of the finger-bar, and associated parts. Fig. 4 is a vertical section, on an enlarged scale, taken on the line *z z*, Fig. 2, with portions broken away, exposing to view the locking-plunger with its spring, and showing the levers, by broken lines, in different positions. Figs. 5 and 6 are respectively enlarged edge and plan views of the locking-plunger and its coiled spring; and Fig. 7 is an enlarged rear view of the lower end of the hand-lever and the tension-lever, showing how they are connected with the frame.

A represents the frame of the machine, which comprises a tubular portion *a*, through which the axle passes, and projecting forward at right angles therefrom.

a' represents the support for the tongue, and a^2 that portion which in this instance carries the crank-shaft, a part of the gearing, and fly-wheel, and to which at its outer end is pivoted the coupling-arm.

B B are the main supporting and driving wheels mounted in the usual manner upon the ends of the axle C, with which they have their usual ratchet connections. A large sprocket-wheel B^2, mounted upon the axle and connected with chain-belt to bevel and sprocket-wheel *b*, which in turn connects with and drives the crank-shaft by means of pinion secured thereon and inclosed within arm a^2, constitutes the gearing.

b' is the pitman having the usual connections with fly-wheel and sickle.

D is the coupling-arm, pivotally connected at one end to the front of the frame and at its opposite end by a yoke *d* with the shoe *d'*, to which the finger-bar D^2 is attached. The yoke *d* is formed with a sleeve, which encircles and is capable of turning on the coupling-arm D, and is forked and hinged or pivoted by its arms to said shoe in a line parallel to the advance of the machine.

d^2 is the push-bar, pivotally connected at one end to a projecting lug underneath the frame midway between the wheels B B and at its front end to the yoke *d*.

The gearing and method of connecting the cutting apparatus to the frame of the machine, as hereinbefore described, constitutes no essential part of my invention, but are shown and described as suitable for use in connection with my improvements, being adapted to conform freely in movement with the inequality of the ground.

E is a bifurcated lifting hand-lever pivoted by its branches, which are tied together near their lower ends by a cross-bar *e* to a sector *f* upon the frame. Lever E is provided with the usual thumb-latch and an open locking-plunger *e'*, which is fitted to slide in ways inside its branches and is formed with a cross-bar e^3, held in engagement with the sector *f* by a spring e^2, as shown in Figs. 1, 2, 4, 5,

6, and 7. The lever E, when moved to its extreme rearward position, is locked by cross-bar e^3 of the plunger e', passing behind sector f, and when in its normal or forward position is prevented from swinging beyond a vertical line by cross-bar e coming in contact with stop f' upon sector f.

f^4 is a slight depression in sector f, in which cross-bar e^3 of plunger e' rests when the lever is at its normal position, and which depression prevents the lever from moving rearward upon its pivot by vibrations of the machine in passing over uneven ground.

Pivoted centrally between the branches of lever E at a suitable distance above its pivot is the bell-crank F, which is made to swing within the plane of the movement of the hand-lever. Upon the bell-crank F to the rear of the hand-lever is pivoted the foot-lever G. Lever G is provided with a shoulder g, which opposes a corresponding shoulder g' upon the bell-crank, as shown by dotted lines in Fig. 4, which causes the bell-crank to move with the foot-lever when the lever is pressed downward, but permits the lever to move in the opposite direction. Upon either side of the bell-crank are located lugs f^3 f^3, which engage with the hand-lever E, as the lever swings upon its pivot and carries the bell-crank F with it.

H is a bell-crank pivoted upon a bracket attached to the pole or any convenient part of the frame, and is connected from its upper side to the forward arm of the bell-crank F by connecting-rod h. Bell-crank H is connected by means of connecting-rod h^2 to the horizontal arm of bell-crank J, pivoted upon a stud projecting from the left side of the coupling-yoke d. The vertical arm of bell-crank J in turn is connected by rod h^3 to the upper end of standard j, pivoted to the block j', bolted upon the finger-bar, and which pivot is so arranged that the upper end of the standard may not move toward the machine without lifting the outer end of the cutter-bar.

K is a close-coiled spring connected at one end to bell-crank H at a point on its radius between its connection with bell-crank F and its pivot and at the other end to the tension-lever L, pivoted upon the same pivot as that of the hand-lever E, the quadrant f being hollowed out for its reception, as shown in Fig. 7. A machine-screw l, passing through the lever L and against the frame, serves to regulate the tension of spring K.

The operation of my device is as follows: The coiled spring K, connecting the tension-lever L with the upper side of bell-crank H, tends to turn the bell-crank backward upon its pivot, and in acting through connecting-rod h^2, bell-crank J, connecting-rod h^3, and lever j, pivoted in block j' upon the finger-bar, sustains a part of the weight of the cutting apparatus throughout its length that otherwise would rest upon the ground. When the foot-lever G is pressed downward, it carries the bell-crank F with it, as shown in Fig. 4 by broken lines. The bell-crank, acting through connecting-rod h, bell-crank H, and its connections with the cutting apparatus, lifts the finger-bar from the ground. To lift the finger-bar still higher above the surface of the ground the hand-lever is carried backward until the plunger e' drops in place back of quadrant f, which is also illustrated by broken lines in Fig. 4. While the cutting apparatus is moving upward toward the frame, the coiled spring K is decreasing in power, but it gains in leverage as the bell-crank H turns, thus increasing the distance between the spring and bell-crank and making the spring effective throughout the movement of the hand and foot levers.

I claim—

1. In a mowing machine, the combination with the cutting apparatus, of a hand lever pivoted to the machine, and a bell crank and foot lever pivoted to said hand lever above its pivot upon the frame, and having a lifting connection with the cutting apparatus, substantially as and for the purpose set forth.

2. In a mowing machine, the combination with the cutting apparatus, of a hand lever pivoted to the machine, a bell crank pivoted to the hand lever above its pivot upon the frame and having one arm connected with the cutting apparatus and a foot lever pivoted to the other arm of the bell crank whereby the cutting apparatus may be lifted by the hand or foot lever, the hand lever lifting it to a greater height, substantially as and for the purpose set forth.

3. In a mowing machine, the combination with the cutting apparatus, of a hand lever pivoted to the machine, a bell crank pivoted to the hand lever above its fulcrum and having one arm connected with the cutting apparatus, a foot lever pivoted to the other arm of the bell crank, a tension lever secured to the machine frame, and an elastic medium connecting the lifting mechanism with the tension lever at a point below the axle, whereby as the tension of the elastic medium decreases, the leverage of the lifting bell crank increases, substantially as and for the purposes set forth.

4. In a mowing machine, the combination with the cutting apparatus and hand lever, of a bell crank and foot lever pivoted upon the hand lever above its fulcrum, a lifting bell crank mounted upon a suitable support above the cutting apparatus on a line with or above the axle and connected with said bell crank on the hand lever, a standard on the inner end of the finger bar and a bell crank on the coupling arm connected with the lifting quadrant and with said standard, a tension lever pivoted to the frame and extending below the axle, and a coiled spring connecting the lifting bell crank and tension lever, and means for adjusting the tension lever for varying the tension of the spring, substantially as and for the purpose set forth.

5. In a mowing machine, the combination

with the cutting apparatus of a bifurcated hand lever connected by its branches with a quadrant upon the frame, an open locking plunger sliding in ways upon the inside of said branches, and adapted to engage with said quadrant to lock the lever at the end of its throw, a bell crank connected with the cutting apparatus and pivoted to the hand lever and adapted to swing within said plunger between the branches of the hand lever, said bell crank being provided with a foot lever and with a lug adapted to engage with the hand lever whereby the cutting apparatus is lifted from the ground and sustained in position through the joint action of said hand lever and bell crank, and means for releasing the locking plunger, substantially as and for the purpose set forth.

EDWARD J. BIRKETT.

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