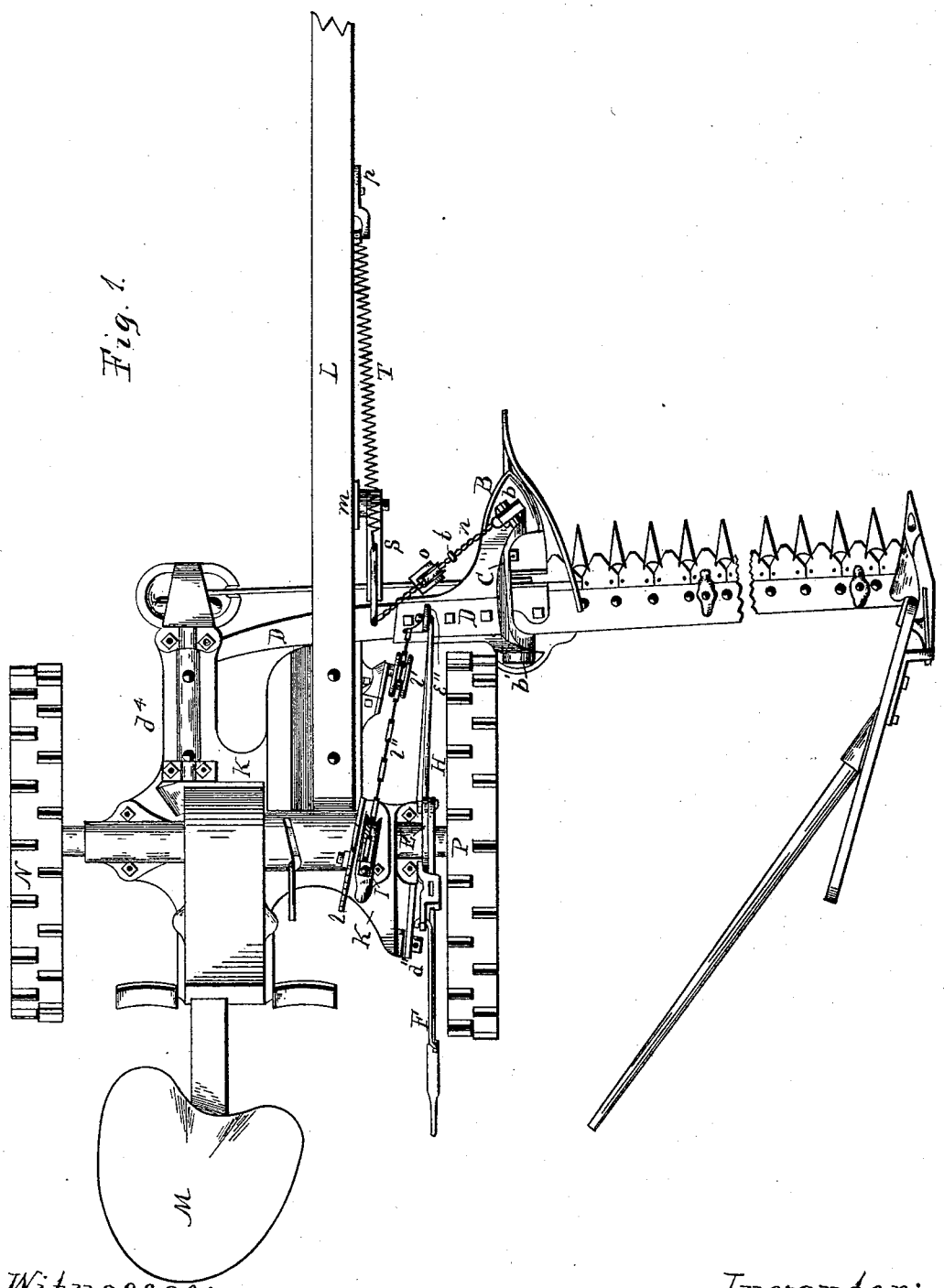
(No Model.) 3 Sheets—Sheet 1.

J. H. JONES.

MOWING MACHINE.

No. 454,741. Patented June 23, 1891.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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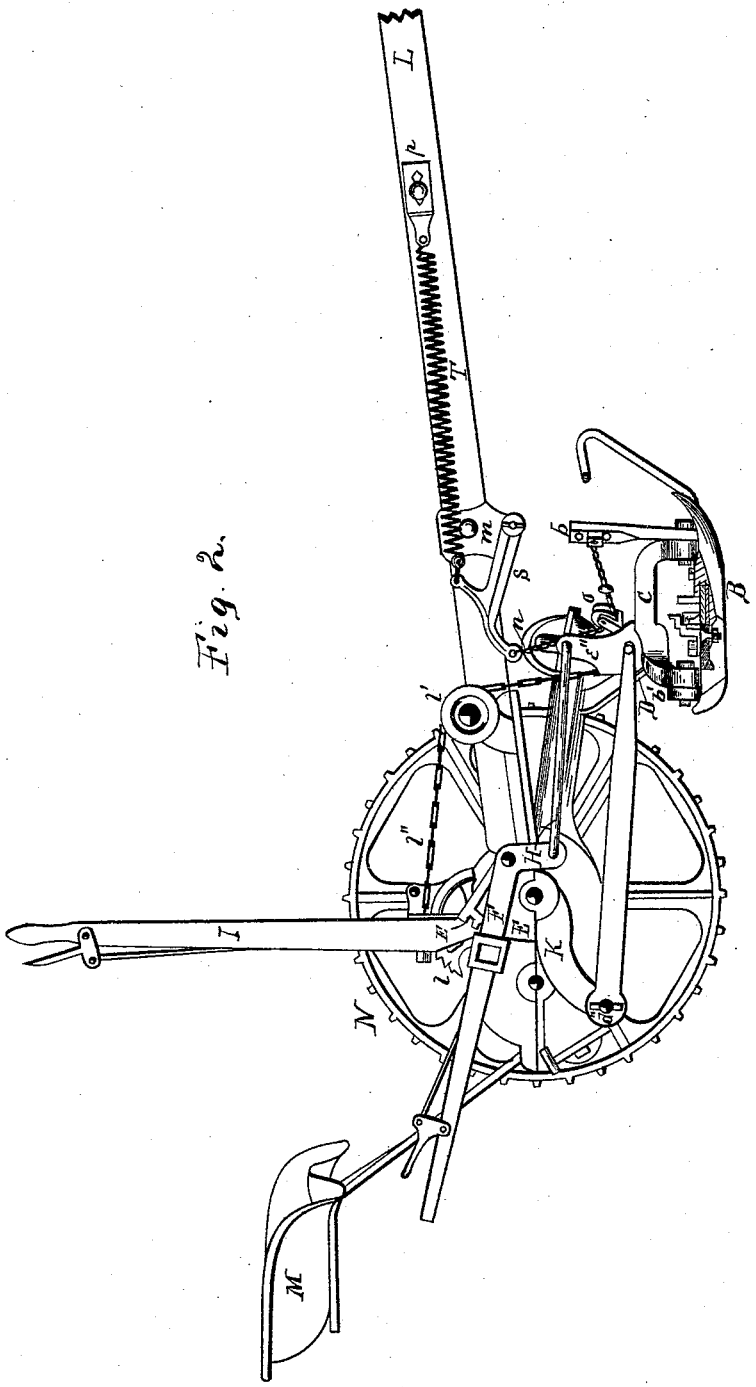
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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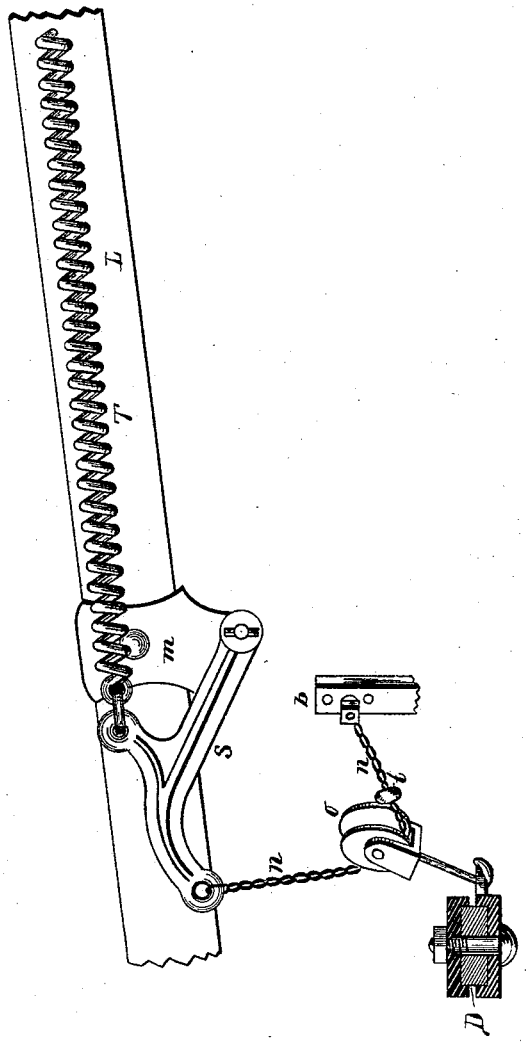
Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES HERVA JONES, OF ROCKFORD, ILLINOIS, ASSIGNOR TO THE EMERSON, TALCOTT & COMPANY, OF SAME PLACE.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 454,741, dated June 23, 1891.

Application filed May 2, 1891. Serial No. 391,420. (No model.)

To all whom it may concern:

Be it known that I, JAMES HERVA JONES, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Mowing-Machines, of which the following is a specification.

This invention relates to that class of machines known as "two-wheeled side-cut mowers." Its object is to produce a more efficient machine of its class, and my improvements are mainly of a detail character, as will be hereinafter described.

In the accompanying drawings, Figure 1 is a plan view of a mowing-machine embodying my invention. Fig. 2 is a side elevation of the machine. Fig. 3 is a side elevation of the counterbalance mechanism, its connection with the tongue, and with cutting apparatus.

The heel end of the finger-bar is securely fixed to a shoe B in any suitable manner. This shoe B is provided with an arm *b*, rising vertically from the upper face of its forward end portion, for a purpose to be hereinafter described. This arm *b*, in connection with an ear *b'*, rising from the rear end portion of the shoe, serves to connect the shoe by hinge-joint to the yoke C in the usual manner. The yoke C is securely fixed to the inner end of a coupling-bar D, and the coupling-bar has a suitable connection with the main frame to allow the cutting apparatus to rise and fall and also allow a rocking movement of the finger-bar. The forward end of a push-bar has a pivotal connection with the vertical arm *e''* of a bracket fixed to the coupling-bar in a manner to support the cutting apparatus in its lateral position relatively with the machine to resist the draft-strain and permit a rocking axial movement thereof, and also to prevent accidental displacement. This push-bar has its other end pivotally connected with the main frame by encircling a stud *d''*.

A bracket E, produced in segment ratchet form, is fixed in position on the main frame of the mowing-machine, and the angular rocking lever F is pivotally connected thereto concentric with the segment. The lever F is provided at its handle end with a thumb-lever suitably connected with a spring-actuated detent fitted to engage the teeth of the segment-ratchet to hold the lever in its adjusted position. A link H serves to connect the depending arm of the rocking lever with the free end of the vertical arm *e''*, fixed to the coupling-arm in such a manner that an up-and-down movement of the free end of the lever will impart an axial rocking movement to the cutting apparatus to elevate or depress the point of the finger-guards to vary the height of the cut.

The hereinbefore-described mechanism, with its supporting main frame K, having tongue L and seat M thereto attached, is by means of a suitable axle mounted on driving-wheels N and P in a free manner.

The mechanisms employed to lift the cutting apparatus, consisting, essentially, of a saw-toothed segment-ratchet *l*, a lifting-lever I, fitted with a thumb-lever and spring-actuated pawl to engage the ratchet-teeth, a chain-supporting sheave *l'*, and a lifting-chain *l''*, connecting the lever with the coupling-bar, are substantially the same and operated in substantially the same manner and for the same purpose as like parts to be found in mowing-machines now in use.

At S is represented a tri-armed compensating lever having a pivotal connection with the depending bracket *m*, fixed to the tongue.

At *n* is represented a chain, one end of which is connected to the upper end of the vertical arm *b*, rising from the shoe, and is made vertically adjustable in its connection therewith by means of a series of holes formed in the vertical arm for the purpose of varying its lifting force. The chain *n* from its connection with the vertical arm *b* is passed under a sheave *o*, which is suitably connected with the coupling-bar, and from its passage under the sheave it rises and is connected to the free end of the compensating lever.

At T is represented a counterbalance-spring to the cutting apparatus, having its rear end connected to the central portion of the compensating lever, and its forward end is adjustably connected to the tongue by means of a clip or bracket *p*, made adjustable lengthwise of the tongue by means of its screw-bolt connection therewith, for the purpose of properly adjusting the force of the spring. The chain *n* is fitted with the ball *t*,

enlarged link, ring, or other appliance to limit the passage of the chain under the sheave. The counterbalance-spring T, by means of its chain connection with the vertical arm rising from the shoe, operates to lift or counterbalance a portion of the weight of the outer end of the finger-bar portion of the cutting apparatus to lessen its frictional contact with the ground to prevent side draft, and its passage under the sheave operates to support a portion of the whole weight of the cutting apparatus and its attachments and lessen its frictional contact with the ground and transfer the weight thus supported by the spring onto the driving-wheels to increase the traction thereof and render the machine more efficient.

In raising the finger-bar to carry it elevated in transportation the stop *t* on the chain will engage the sheave and prevent the further passage of the chain, but will not in any manner limit the lifting force of the spring on the cutting apparatus.

The conformation of the compensating lever and its connection with the parts are such that the loss of elastic force in the spring by contraction is compensated by increased leverage as the rear portion of the compensating lever rises, so as to render the lifting action of the spring on the cutting apparatus substantially uniform throughout the range of its action. As the spring raises the lever by its connection therewith, the distance between the pivotal point of the lever and the connection between it and the cutting apparatus will be shortened. Thus the shortening of said distance will compensate for the loss of spring force, and a double compensating action will be seen to exist both in relation to the spring and cutting apparatus. This spring lifting mechanism, in connection with the ordinary lifting mechanism hereinbefore described, operates to lessen the power or effect heretofore required in lifting the cutting apparatus.

By constructing the compensating lever and counterbalance-spring of separate pieces, but having a connection with each other, the parts are more easily constructed, and should the lever break or the spring give out either could be easily replaced, and the parts are more easily adapted to the different makes of machines.

The foregoing description relates mainly to the new features embodied in the machine, and which of themselves do not constitute a complete machine, and the several parts not herein shown or described necessary to produce a complete machine may be of any of the varieties known and capable of use in connection with my improvements.

When the expression "cutting apparatus" is employed throughout the specification and claims it is intended to include the coupling-bar, the shoe, and the finger-bar, and also such parts as are supported thereby to render them operative in mowing. Wherever the cutting apparatus as a whole is not intended the part intended has been designated.

I claim as my invention—

1. In a mower, the combination, with the main frame and the rising and falling cutting apparatus connected at one end thereto, of a counterbalancing-spring connection between the frame and the cutting apparatus, one end thereof being connected to the frame and the other attached to the finger-bar, whereby spring force exerted to float or counterbalance the cutting apparatus as a whole is applied first to diminish the pressure of the outer end of the finger-bar on the ground, substantially as set forth.

2. The combination, with the main frame and a rising and falling cutting apparatus connected at one end to the frame, of a counterbalance-spring connected to the main frame, and intermediate mechanism connecting the spring with the finger-bar portion of the cutting apparatus, substantially as set forth.

3. The combination, with the main frame, a rising and falling cutting apparatus connected at one end to the frame, and an arm rising from the finger-bar portion of the cutting apparatus, of a counterbalance-spring connecting the said arm with the main frame and adapted to exert its force in a direction lateral to the machine, substantially as set forth.

4. The combination, with the main frame, a rising and falling cutting apparatus connected at one end to the frame, and an arm rising from the finger-bar portion of the cutting apparatus, of a counterbalance-spring connected with the main frame and the arm, the points of connection of the spring with the arm being located at different distances along the arm, substantially as set forth.

5. The combination, with the main frame, a rising and falling cutting apparatus connected at one end to the frame, and an arm rising from the finger-bar portion of the cutting apparatus, of a counterbalance-spring connected with the said arm and with the main frame, the said spring exerting its force on the cutting apparatus laterally of the machine, and means for adjusting the tension of the spring, substantially as set forth.

6. The combination, with the main frame, the finger-bar portion of the cutting apparatus, and the rising and falling coupling-bar portion connecting the finger-bar portion of the cutting apparatus with the main frame, of a compensating counterbalance-spring and lever connecting the finger-bar portion of the cutting apparatus with the main frame, substantially as set forth.

7. The combination, with the main frame, the rising and falling coupling-bar connected at one end to the frame, and the finger-bar hinge-jointed at one end to the coupling-bar, of a compensating lever pivoted to the main frame, a counterbalance-spring connecting the main frame and one arm of the com-

pensating lever, and connections between another arm of the said compensating lever and the finger-bar and coupling-bar, whereby a lifting strain is exerted first upon the finger-bar and subsequently upon the cutting apparatus as a whole, substantially as set forth.

8. The combination, with the main frame, the finger-bar portion of the cutting apparatus, and the rising and falling coupling-bar portion connecting the finger-bar portion of the cutting apparatus with the main frame, of a lever having a pivotal connection with the main frame and so connected with the cutting apparatus that the leverage of the cutting apparatus is decreased and increased as the cutting apparatus rises and falls, and a spring exerting its force upon the lever and through the same upon the finger-bar portion of the cutting apparatus, substantially as set forth.

9. The combination of a main frame, a rising and falling cutting apparatus connected at one end thereto, a lifting-lever connected with the main frame and cutting apparatus, a double compensating lever, and a counterbalance-spring connecting the cutting apparatus with the main frame, the connections of the lifting-lever and compensating lever with the main frame being independent of each other, substantially as set forth.

10. The combination, with the main frame, the finger-bar portion of the cutting apparatus, and a rising and falling coupling-bar portion connecting the finger-bar portion of the cutting apparatus with the main frame, of a spring having a connection with the main frame, and a double compensating lever having a pivotal connection with the main frame, a connection between the lever and spring, and a connection between the lever and cutting apparatus, substantially as set forth.

11. The combination, with the main frame, the finger-bar portion of the cutting apparatus, and a rising and falling coupling-bar portion of the cutting apparatus connecting the finger-bar portion of the cutting apparatus with the main frame, of a counterbalance-spring and a double compensating lever, said spring exerting a lifting force upon the coupling-bar portion of the cutting apparatus through the medium of the compensating lever, substantially as set forth.

12. The combination, with the main frame and the rising and falling cutting apparatus connected at one end to the main frame, of a spring, a support for the spring attached to the main frame, a sheave attached to the coupling-bar portion of the cutting apparatus, a flexible connection between the spring-support and the finger-bar portion of the cutting apparatus, and a stop to limit the passage of the flexible connection under the sheave, substantially as set forth.

13. The combination, with the main frame, a rising and falling cutting apparatus connected at one end to the frame, a spring, and a spring-support attached to the main frame, of a chain connecting the spring-support with the finger-bar portion of the cutting apparatus, said spring having a movable connection with the coupling-bar portion of the cutting apparatus, and a stop on the chain between the connection with the said finger-bar and coupling-bar portions of the cutting apparatus, whereby the outer end of the cutting apparatus is first lifted and the cutting apparatus as a whole subsequently lifted, substantially as set forth.

14. The combination, with a main frame, of a rising and falling cutting apparatus connected at one end thereto, a sheave attached to the coupling-bar portion of the cutting apparatus, a flexible connection connected with the finger-bar portion of the cutting apparatus and passing under the sheave, and a spring supported by the main frame exerting its force upon the cutting apparatus through the flexible connection, substantially as set forth.

15. The combination, with the main frame, and the rising and falling cutting apparatus connected at one end to the frame, of a lifting-lever connected with the main frame and cutting apparatus, and a counterbalance-spring connected with the main frame and the finger-bar portion of the cutting apparatus, the connections of the lever and the spring with the main frame and the cutting apparatus being independent of each other, substantially as set forth.

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