No. 741,159. PATENTED OCT. 13, 1903.

N. NILSON.

MOWING MACHINE.

APPLICATION FILED JAN. 24, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1

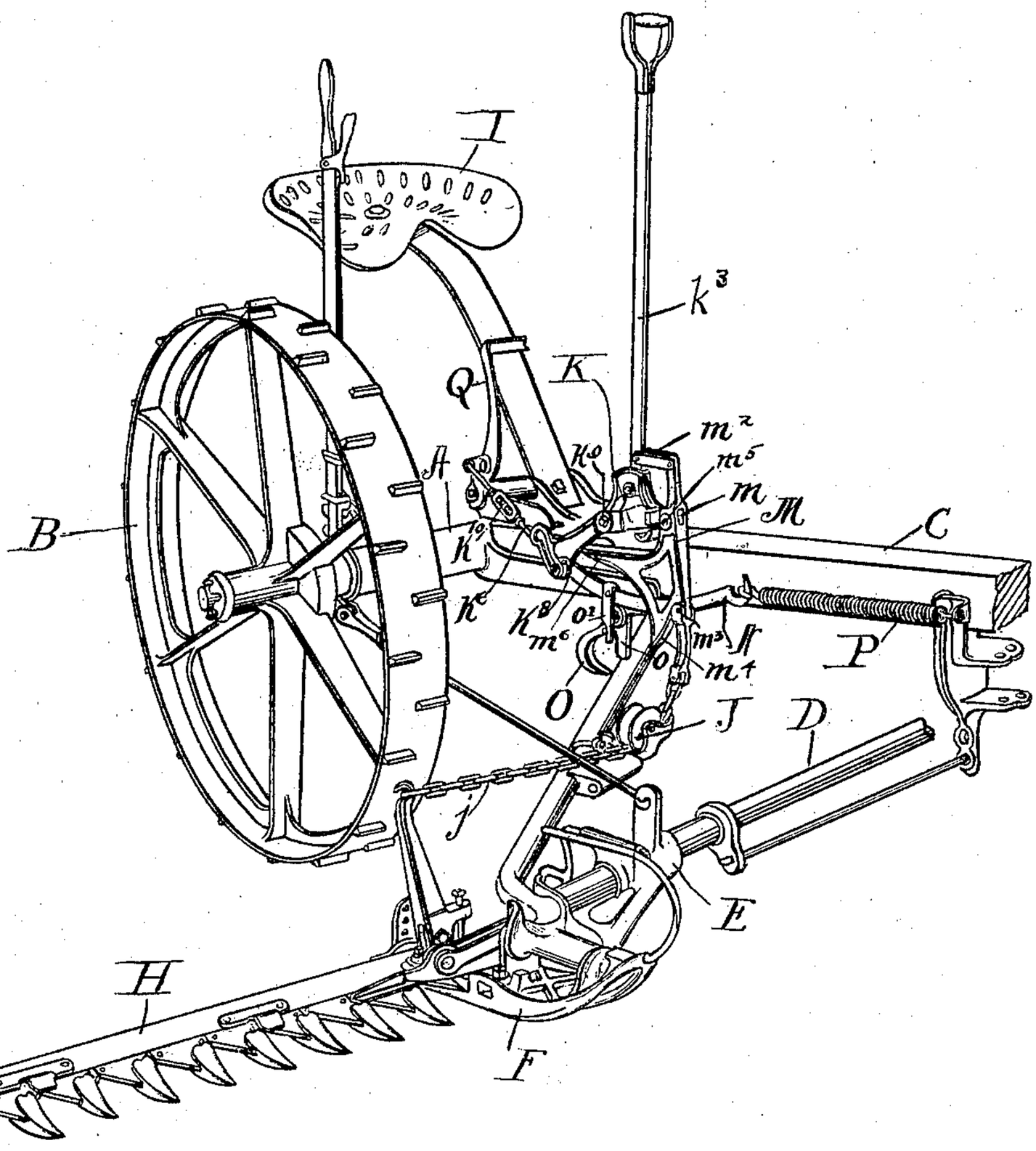


FIG. 5

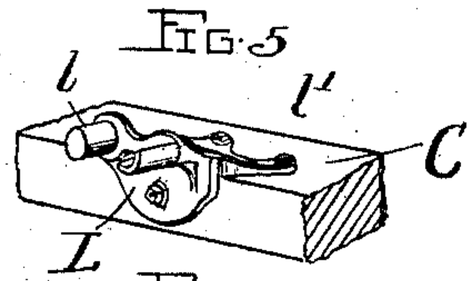


FIG. 6

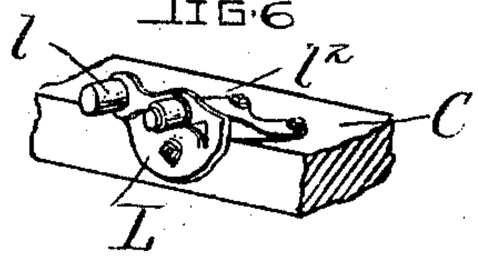


FIG. 2

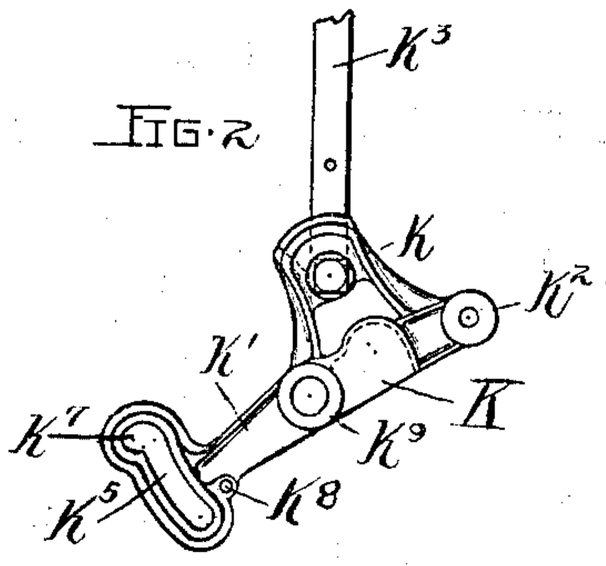


FIG. 2a

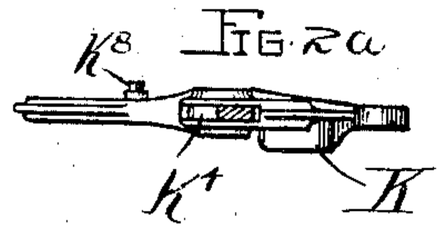


FIG. 4

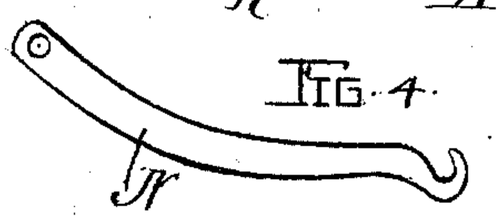
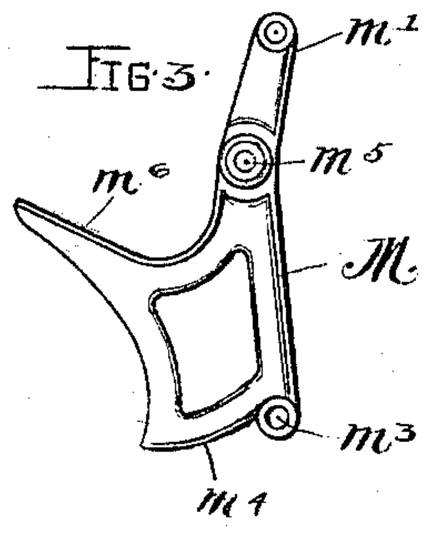


FIG. 3



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Nils Nilson

No. 741,159. PATENTED OCT. 13, 1903.

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MOWING MACHINE.

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NO MODEL. 2 SHEETS—SHEET 2.

FIG 7

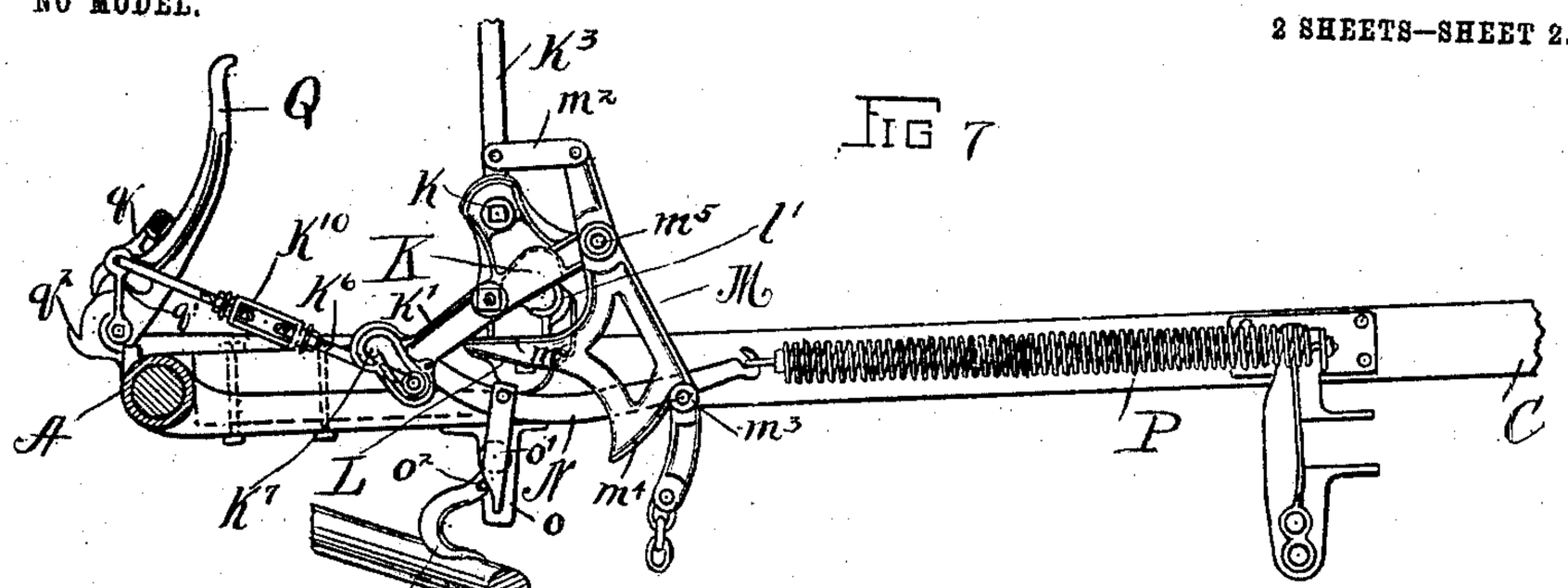

FIG 8

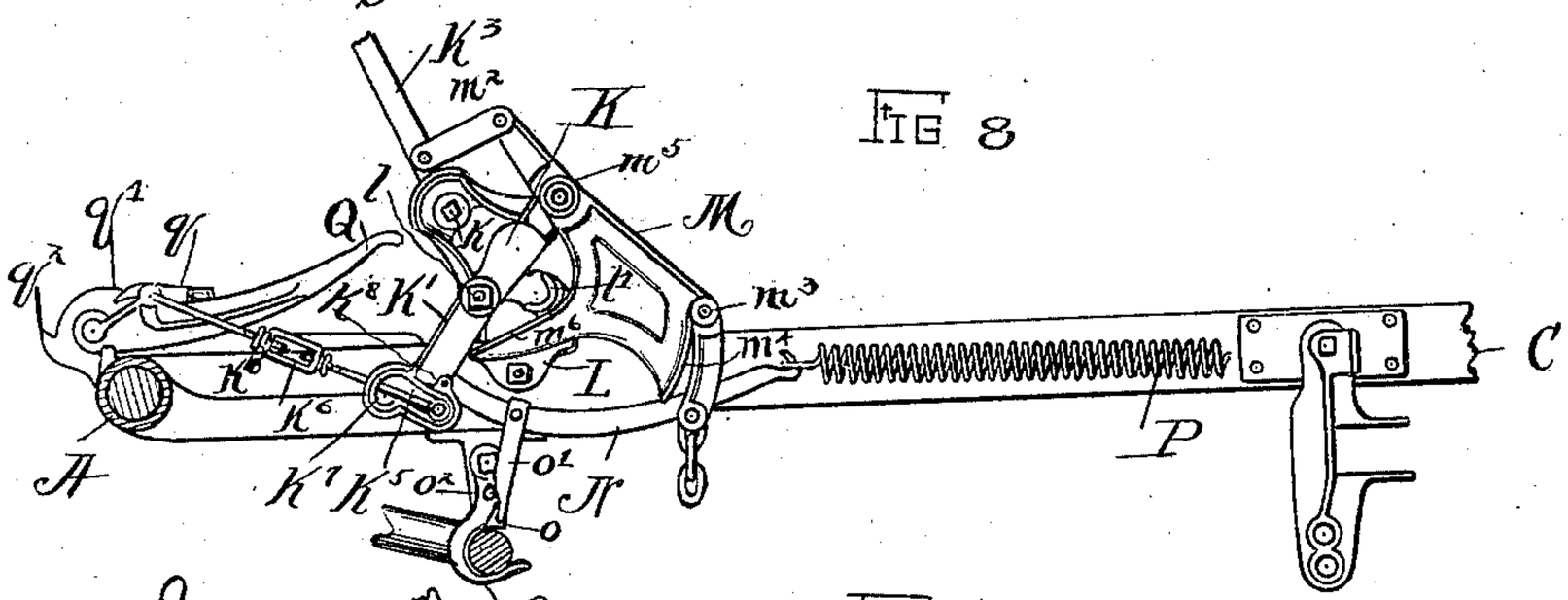

FIG 9

FIG 10

WITNESSES:
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No. 741,159. Patented October 13, 1903.

UNITED STATES PATENT OFFICE.

NILS NILSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO INTERNATIONAL HARVESTER COMPANY, A CORPORATION OF NEW JERSEY.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 741,159, dated October 13, 1903.

Application filed January 24, 1903. Serial No. 140,363. (No model.)

To all whom it may concern:

Be it known that I, NILS NILSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Mowing-Machines, of which the following is a specification.

The purpose of my invention is to provide improved means for lifting the coupling-frame of mowers, and has to do in particular with the special construction of the lifting-lever device and its connection with the foot-lever.

Heretofore more or less trouble has been experienced in raising the finger-bars of mowers from the ground first and then to an approximately vertical position with the same lever without requiring an inconvenient amount of movement of the lifting-lever and at the same time preserving the compensating and counterbalancing qualities usually found in such devices. The overcoming of these difficulties is the chief object sought in my invention.

In the drawings, Figure 1 represents enough of a mower to show the application of my invention thereto. Fig. 2 is a side elevation of the principal casting of the lifting-lever with a portion of the hand-lever pivotally connected thereto, and when hereinafter referred to this casting will be termed the "direct" lifting-lever. Fig. 2^a is a plan of the same. Fig. 3 is a side elevation of the intermediate compensating lever. Fig. 4 is a detail view of the compensating spring-link. Fig. 5 is a perspective of a portion of the tongue, setting forth the construction of the casting thereon, on which is pivotally secured the direct lifting-lever. Fig. 6 is a similar view representing a modification of the casting shown in Fig. 5. Figs. 7, 8, 9, and 10 are detached views representing by various positions the operation of the lifting mechanism, Fig. 7 showing the relative position of the constituent elements of said mechanism when the mower is in operation, while Fig. 8 is a similar view after the various parts have been actuated to the extent by which they are affected by the movement of the foot-lever. Fig. 9 is a view illustrating the possible independent movement of the hand and intermediate compensating levers relative to the direct lifting and foot levers, the latter levers remaining substantially in the positions shown in Fig. 7, the former having been moved through the said hand-lever to the position indicated in this figure; and Fig. 10 is a view indicating the positions of the various parts when the cutting apparatus has been raised to its upper limit.

Referring to the figures, A in Fig. 1 represents a portion of the main frame of a mower, B one of the driving-wheels, C the tongue, D the coupling-bar, E the swivel-hinge secured thereto, F the shoe pivotally secured to the said swivel-hinge, H the finger-bar, and I the seat, all of the type and general arrangement as found on ordinary mowers such as manufactured by the Deering Division of the International Harvester Company, and hence a detailed description of these parts is unnecessary. It may be added, however, that the lifting-chain *j* passes from the lifting device under a sheave J, secured to the rear member of the coupling-frame D, and to an arm extending upwardly from the end of the finger-bar H, substantially as shown, instead of to the end of the gag-lever pivoted to the coupling-frame; but my invention applies equally well to either arrangement.

K is the direct lifting-lever, pivotally secured to the stud *l* on the casting L, which in turn is secured to some portion of the main frame, preferably the tongue, as shown in detail in Fig. 5. The pivotal bearing of the casting K is in the hub k^9 k^9 of said casting. This lever K is provided with three arms *k*, *k'*, and k^2, as set forth in Fig. 2. *k*, the upwardly-extending arm, is constructed with a slot k^4, (see Fig. 2^a,) in which is pivotally secured the hand-lever k^3, the said slot permitting of a limited movement of the said lever therein. The rearwardly-extending arm *k'* is provided with a slot k^5, adapted to receive and afford lost motion for the foot-lever rod k^6, which engages therewith, as shown in Figs. 7, 8, 9, and 10. A turnbuckle k^{10} is interposed between the two parts of this foot-lever rod to furnish means for adjustment of same. The upper end of the

slot k^5 terminates in a lateral recess k^7, in which the lower engaging end of the foot-lever rods locks, as hereinafter described.

k^8 is an aperture located in the lifting-lever K, beneath the pivotal point thereof, and adapted to receive a stud or bolt for pivotally securing the compensating spring-link N to the said lifting-lever K. To the lever K is secured the intermediate compensating lever M, the slot m therein (see Fig. 1) pivotally engaging the forwardly-extending arm k^2 of the said lever K. The upwardly-extending arm m' of the lever M is connected with strap-links m^2 to the hand-lever k^3. To the downwardly-projecting portion of the lever M is secured the chain which connects with the coupling-frame, as previously described. A chain-link, however, is interposed as a more convenient means of connecting the chain and lever M, and extending downwardly from the pivotal point m^3 of said chain and lever is a stop m^4, the radial distance from the pivotal center m^5 of the lever M being greater than at the pivotal point m^3 of the chain-link and lever. The object of this stop is to increase the movement of the coupling-frame-connecting end of the lifting-lever when the coupling-frame is approaching the upward limit of its travel. Extending rearwardly from the downwardly-projecting portion of the intermediate lever M is the rigid arm m^6, (see Fig. 3,) adapted to engage a projection l' on the casting L, as shown in Fig. 5, or it may be a modification of this projection, such as the roller l^2. (Shown in Fig. 6.)

O is a hook flexibly depending from the casting o, which is secured beneath the tongue C, and it is so situated that when the coupling-frame is raised by the lifting-lever mechanism to its highest position the said hook O will engage the rear member of the coupling-bar D and hold suspended the said coupling-frame. Rigidly secured to the compensating spring-link N is the depending arm o', and in the side of the hook O is the pin o^2. The arrangement of this depending arm and pin in the hook O is such that the initial movement of the lifting-lever K in lowering the coupling-frame will cause the said depending arm o' to impinge the said pin o^2 and disengage the hook from the said coupling-frame.

The action of the depending arm o' upon the hook O will be understood when it is remembered that the hook pivots upon the fixed support or casting o and is therefore free to swing back and forth, and as the central axis and center of gravity of the hook lie directly above the rear member of the coupling-frame the hook will automatically engage the frame whenever the latter is raised to a sufficient height. To disengage the hook O from the bar of the coupling-frame, it becomes necessary to provide means for pushing the hook to one side after the bar has been slightly raised. This is accomplished by securing an arm o' rigidly to the compensating spring-link N above the hook O. It is evident that as the lifting mechanism is operated to raise or lower the coupling-frame the spring-link and arm will be moved correspondingly forwardly or rearwardly. This arm o' in being carried rearwardly on the spring-hook when lowering the coupling-frame will engage the pin o^2 on the hook O, swinging the hook over and disengaging it from the bar. It should be borne in mind that in operating the lifting mechanism when lowering the coupling-frame the initial movement of the lifting-lever operates first to drop the finger-bar from a vertical to a horizontal position. The coupling-frame during such initial movement remaining substantially stationary will therefore permit the spring-link to disengage the hook, after which the coupling-frame is permitted to drop.

The link N, as before stated, is pivotally secured to the rearwardly-extending arm k' of the lifting-lever K, its forward end engaging the counterbalancing-spring P, which is suitably secured to some fixed portion of the frame, preferably the tongue.

Q is the foot-lever, provided with the dog q, which engages the notch q' (see Fig. 10) to hold the cutting apparatus partly raised or the notch q^2 to limit the downward drop of same, the said notches q' and q^2 being in a segment as one piece with the frame of the machine.

The operation of the device is as follows: When the cutting apparatus is in operative position, the lifting mechanism is in the position shown in Figs. 1 and 7. While in this position the spring P, acting on the direct lifting-lever K through the link N, operates to float the cutting apparatus; but as the line of pull of the said spring is near the pivotal point l of the said lever K the lifting effect will not be so much in this position as after the lever commences to rise. As the cutting apparatus continues in working position the lifting device will accommodate itself to the slight rising and falling of the said cutting apparatus produced in its conforming to the surface of the ground over which it passes, the impinging point of the projecting arm m^6 sliding along the under surface of the lifting-lever K. Owing to this arrangement of levers and the slot k^4 in the lever K the hand-lever k^3 will remain practically stationary, while the movement of the direct and indirect levers K and M will permit sufficient movement to meet the above-stated requirements. When it is desired to raise the cutting apparatus in turning a corner or to pass a slight obstruction, it can be accomplished either with the hand-lever k^3 or the foot-lever Q, but preferably the latter. The relative positions of the various parts are shown in Fig. 8 after the coupling-frame has been raised with the foot-lever. The dog q drops in the notch q' and holds the frame suspended in this position, the impinging point of the arm m^6 sliding up on the under side of the lever K, the said arm itself having contacted the projection l' or roller l^2. Any further

movement of the hand-lever k^3 will now move the lifting-lever K a corresponding amount; but the indirect lever M, the arm m^6 thereof now bearing against the projection l' or roller l^2, will have its movement accelerated, since the relation of the pivotal axis of the said arm and projection or roller is such that a movement of the hand-lever is made possible only by the said indirect lever M advancing more rapidly than the other elements of the combination.

The relative position of the various parts of the lifting device when the coupling-frame is completely raised is shown in Fig. 10. It will thus be observed from the foregoing and from an inspection of the several figures that the spring P has its effective lever-arm increased as it loses reactionary force and, further, that the motion of the intermediate lever M is accelerated as soon as the arm m^6 impinges the said projection or roller, and the effective lever-arm thereof, acting on the chain and coupling-frame, is increased, so that not only is a compensating and counterbalancing effect produced, but there is also effected an accelerated movement of the parts operated upon by the lifting device.

In raising the coupling-frame to its highest position the depending hook O will engage the rear member thereof and sustain said frame in such position, and to lock the frame in this position the end of the rod k^6 drops into the lateral recess k^7, as shown in Fig. 10, the dog q on the foot-lever Q remaining in engagement with the notch q' and securing in this position the entire coupling-frame and connecting parts until the dog q is released. When it is desired to lower the frame, the depending arm o', rigidly secured to the spring connecting-link N, will disengage the hook, as previously described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a mowing-machine, a main frame, a coupling-frame pivotally secured thereto, a lifting-lever, a hand-lever secured to said lifting-lever, and an accelerating device consisting of an intermediate lever pivotally secured to the said lifting-lever and provided with an upwardly and downwardly, and a rearwardly extending arm engaging severally and respectively with the said hand-lever through strap-links, with the said coupling-frame through a chain, and with a roller on the said main frame, all combined substantially as described.

2. In a mowing-machine, a coupling-frame, a foot-lever, a lifting-lever, and a hook flexibly depending from the main frame and adapted to automatically engage the said coupling-frame when it is raised to its upper limiting position, and means in connection with the said lifting-lever for automatically disengaging the said hook and coupling-frame when lowering said coupling-frame, all combined substantially as described.

3. In a mowing-machine, a coupling-frame, a foot-lever, a lifting-lever, a spring and spring-link connected with said lifting-lever, a hook flexibly depending from the main frame and adapted to automatically engage the said coupling-frame when it is raised to its upper limiting position, and an arm rigidly secured to said spring-link for disengaging the flexibly-depending hook from the said coupling-frame, all combined substantially as described.

4. In a mowing-machine, a main frame, a coupling-frame pivotally secured thereto, a stop on said main frame, a foot-lever, a lifting mechanism comprising a direct and an intermediate lever, the direct lever being pivoted to the frame of the mower and provided with an upwardly-extending hand-lever, a rearwardly-extending arm with a slot in the end thereof, and a forwardly-projecting arm, the said intermediate lever being pivoted on the said forwardly-extending arm of the direct lever and having an upwardly, a downwardly and a rearwardly extending arm engaging severally and respectively with the said hand-lever through the strap-links, with the said coupling-frame through a chain and with the said stop on the main frame, and a rod engaging the slot in said arm and connecting with said foot-lever, all combined substantially as described.

NILS NILSON.

In presence of—
J. C. WARNES,
T. H. ALFREDS.