No. 750,827. PATENTED FEB. 2, 1904.

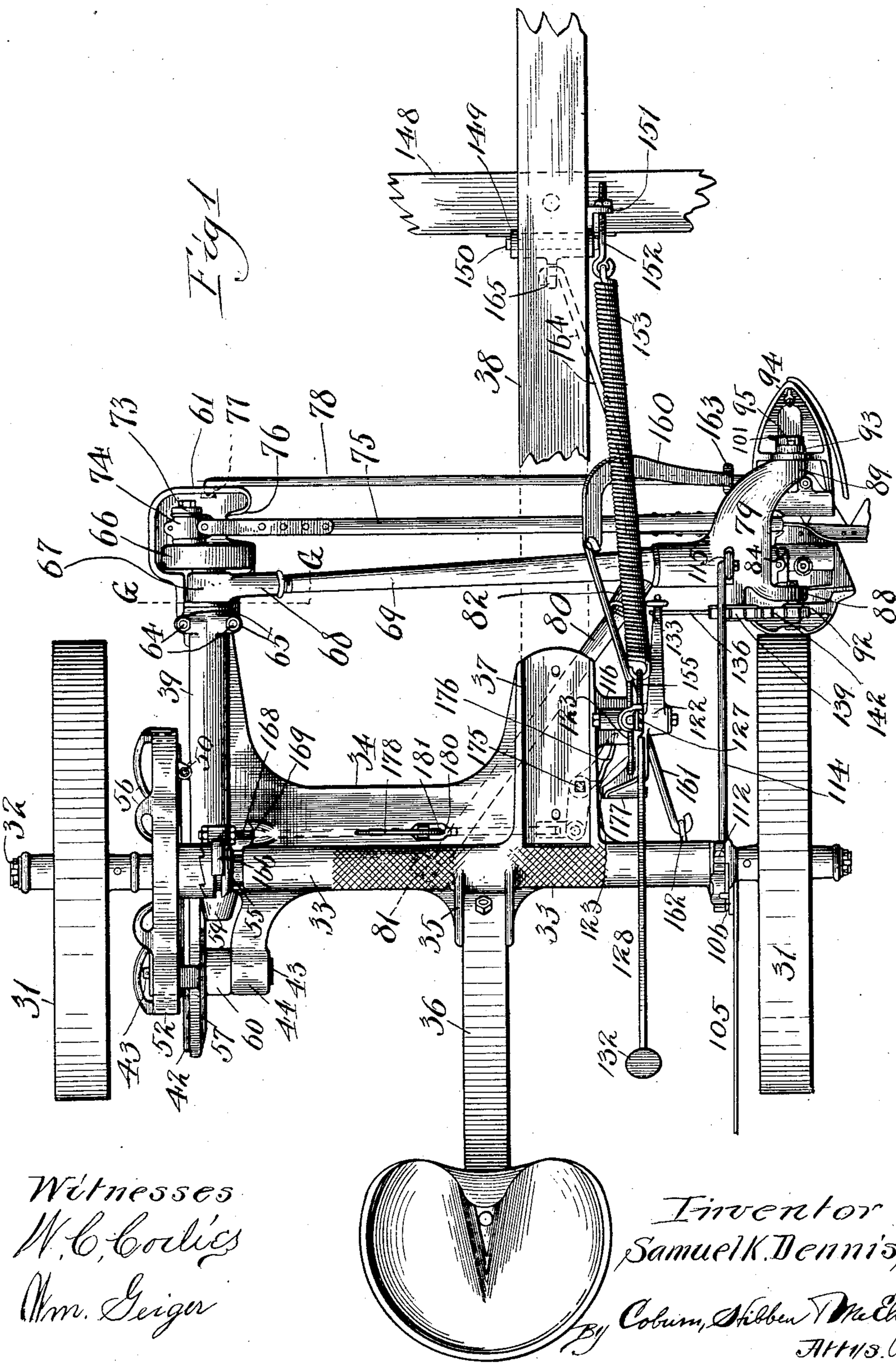
S. K. DENNIS.

MOWING MACHINE.

APPLICATION FILED JULY 28, 1900.

NO MODEL. 11 SHEETS—SHEET 1.

Fig 1



Witnesses
W. C. Cobb's
Wm. Geiger

Inventor
Samuel K. Dennis,
By Coburn, Gibbon & MacElroy,
Att'ys.

No. 750,827. PATENTED FEB. 2, 1904.

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APPLICATION FILED JULY 28, 1900.

NO MODEL. 11 SHEETS—SHEET 2.

Fig 2

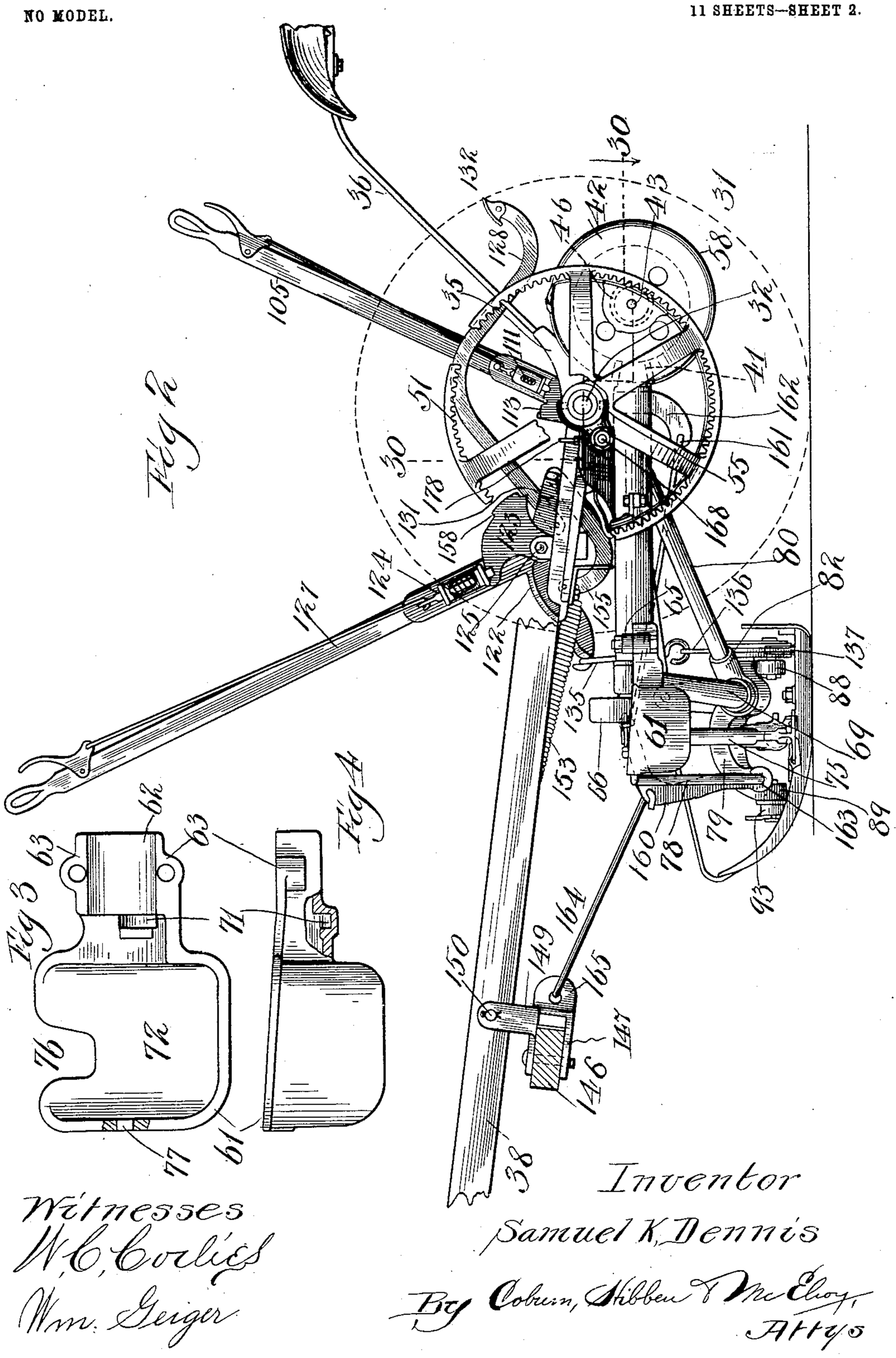

Fig 3

Fig 4

Witnesses
W. C. Curtis
Wm. Geiger

Inventor
Samuel K. Dennis
By Coburn, Stibbens & McElroy,
Attys

No. 750,827. PATENTED FEB. 2, 1904.

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NO MODEL. 11 SHEETS—SHEET 3.

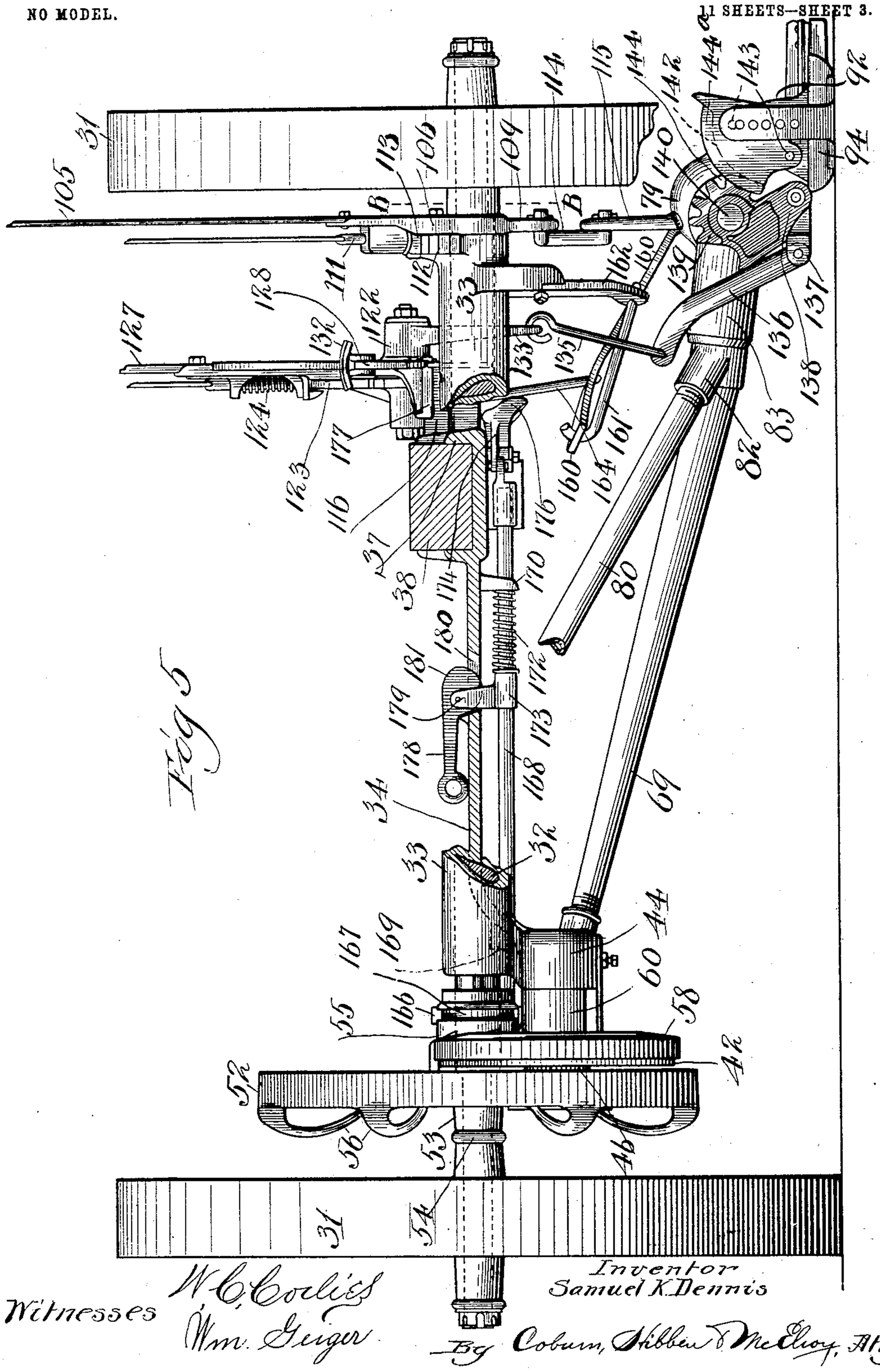

Fig 5

Witnesses
W. C. Coles
Wm. Geiger

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Samuel K. Dennis
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No. 750,827. PATENTED FEB. 2, 1904.

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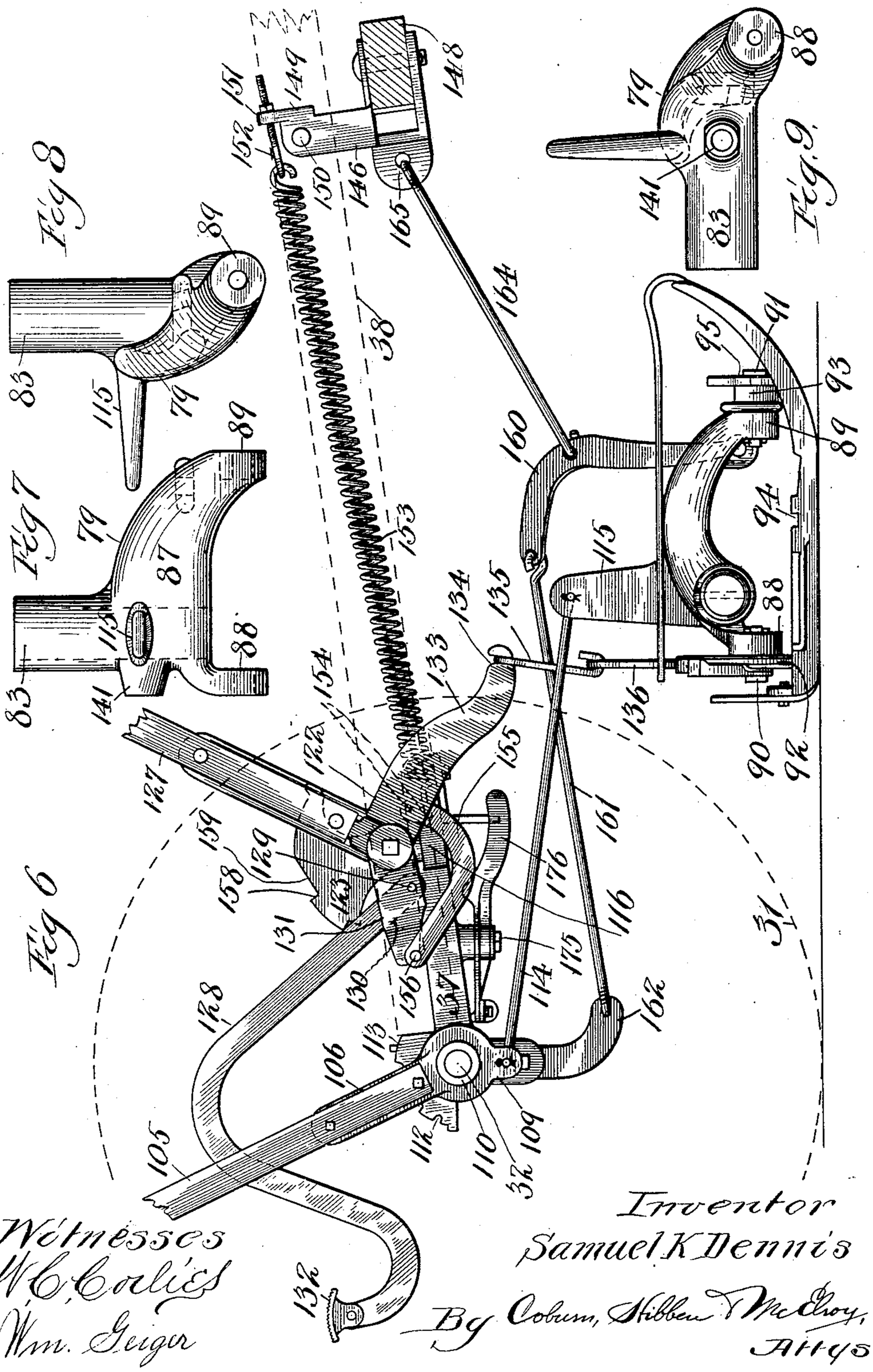
NO MODEL. 11 SHEETS—SHEET 4.



No. 750,827. PATENTED FEB. 2, 1904.

S. K. DENNIS.

MOWING MACHINE.

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NO MODEL. 11 SHEETS—SHEET 5.

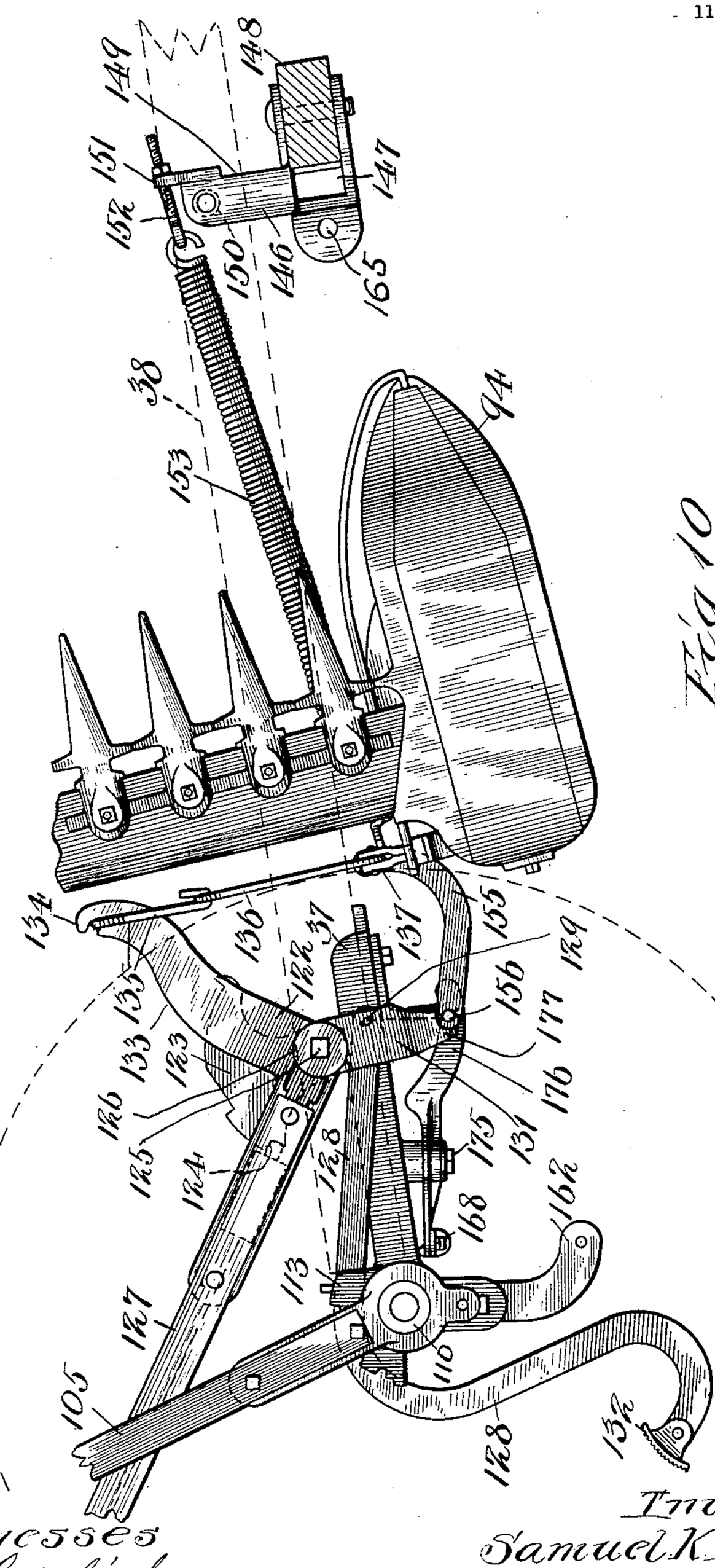

Fig 10

Witnesses
W. C. Curtis
Wm. Geiger

Inventor
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Attys

No. 750,827. PATENTED FEB. 2, 1904.

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NO MODEL. 11 SHEETS—SHEET 6.

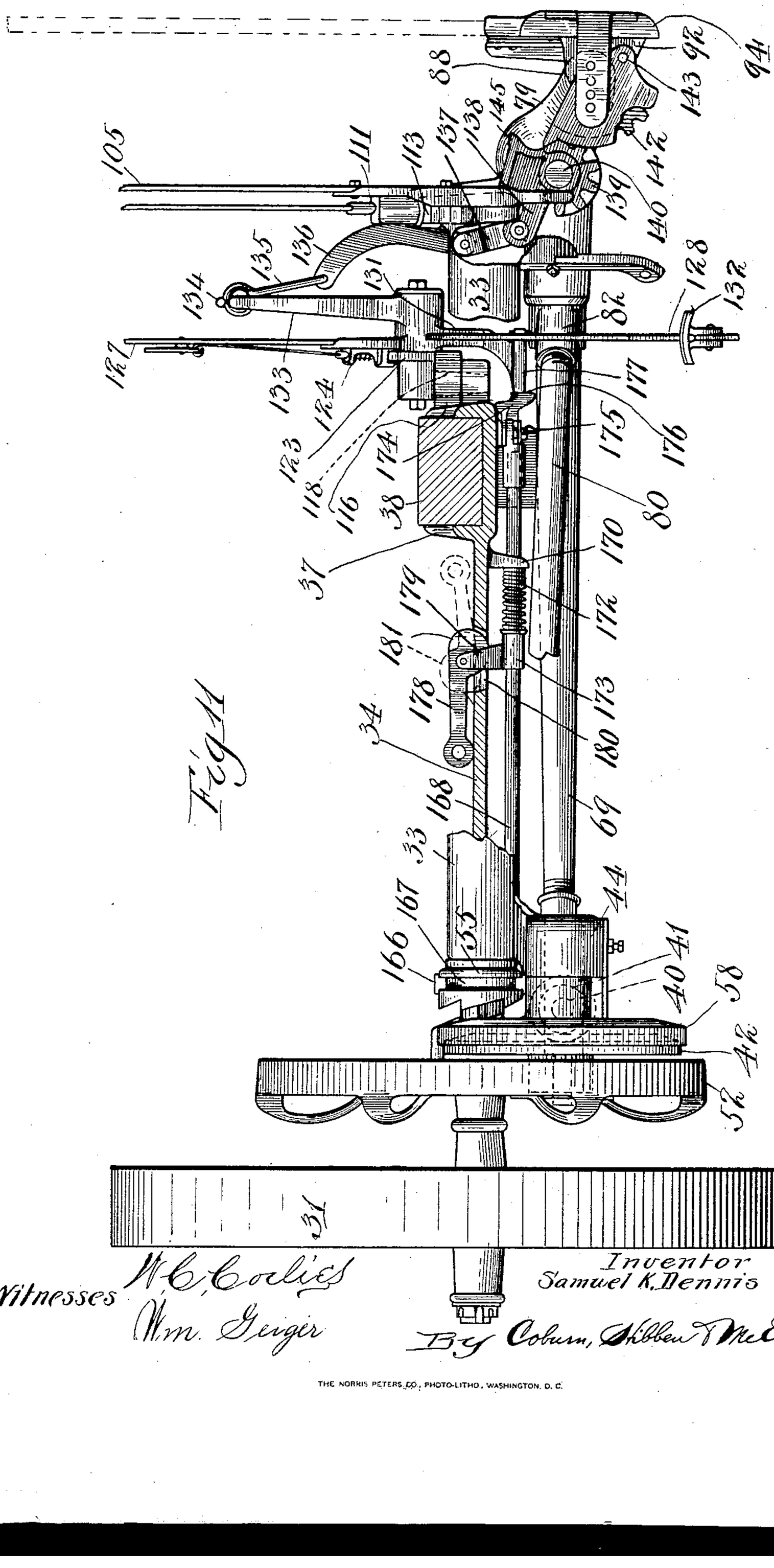


Fig 11

Witnesses
W. C. Codlick
Wm. Geiger

Inventor
Samuel K. Dennis

By Coburn, Gibbon & McElroy, Attys

No. 750,827. PATENTED FEB. 2, 1904.

S. K. DENNIS.

MOWING MACHINE.

APPLICATION FILED JULY 28, 1900.

NO MODEL. 11 SHEETS—SHEET 7.

Fig 13

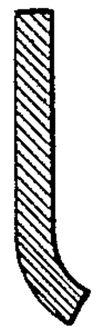


Fig 12

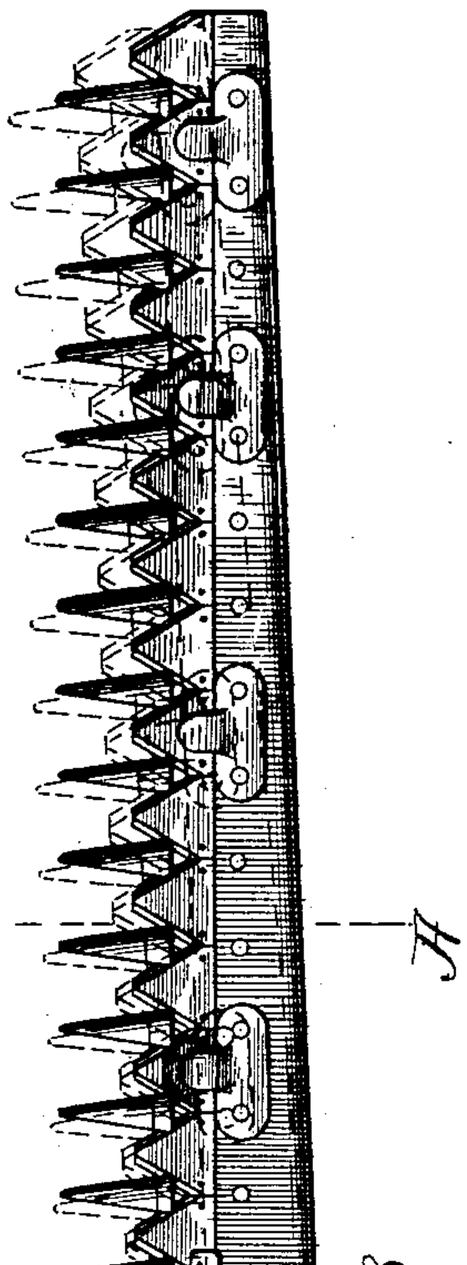


Fig 15

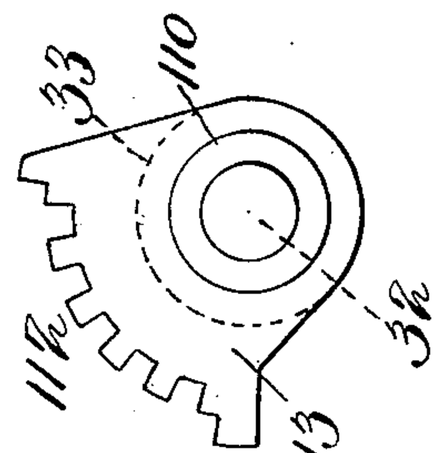
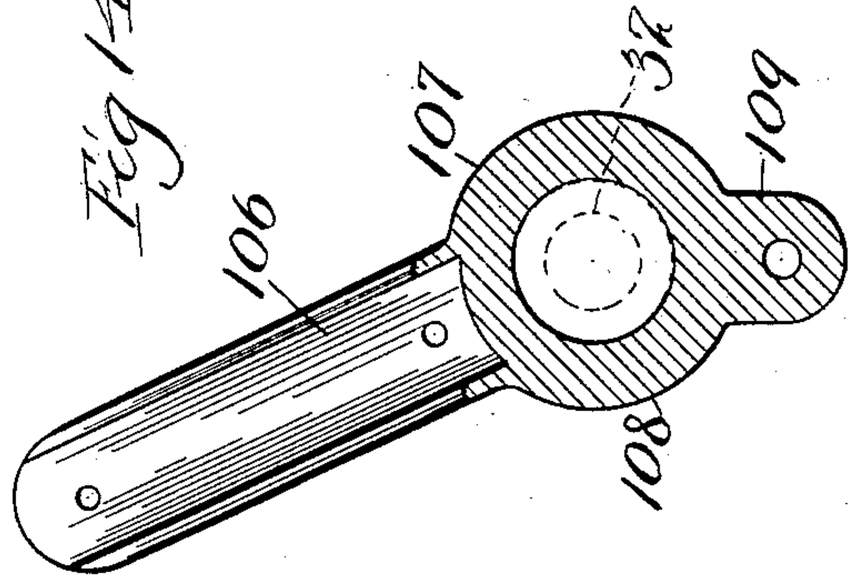


Fig 14



Witnesses
W. C. Coales
Wm. Geiger

Inventor
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No. 750,827. PATENTED FEB. 2, 1904.

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MOWING MACHINE.

APPLICATION FILED JULY 28, 1900.

NO MODEL. 11 SHEETS—SHEET 8.

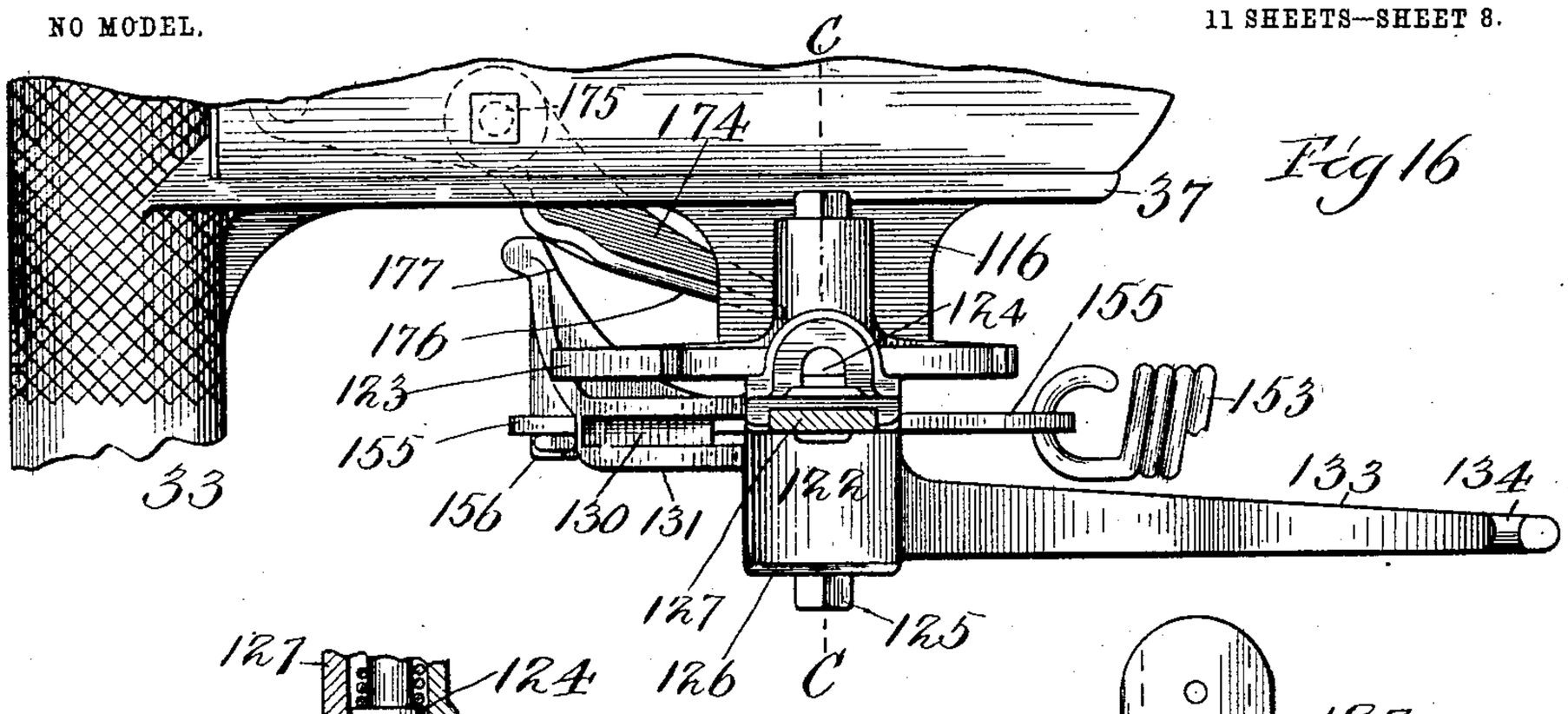

Fig 16

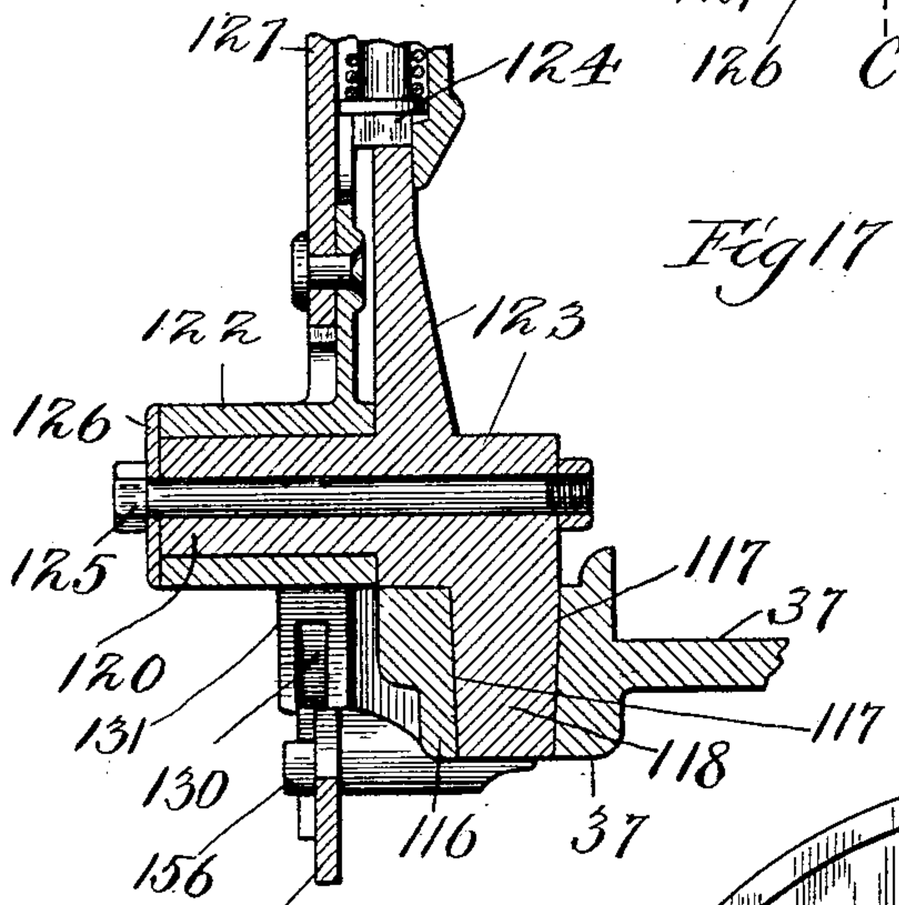

Fig 17

Fig 18

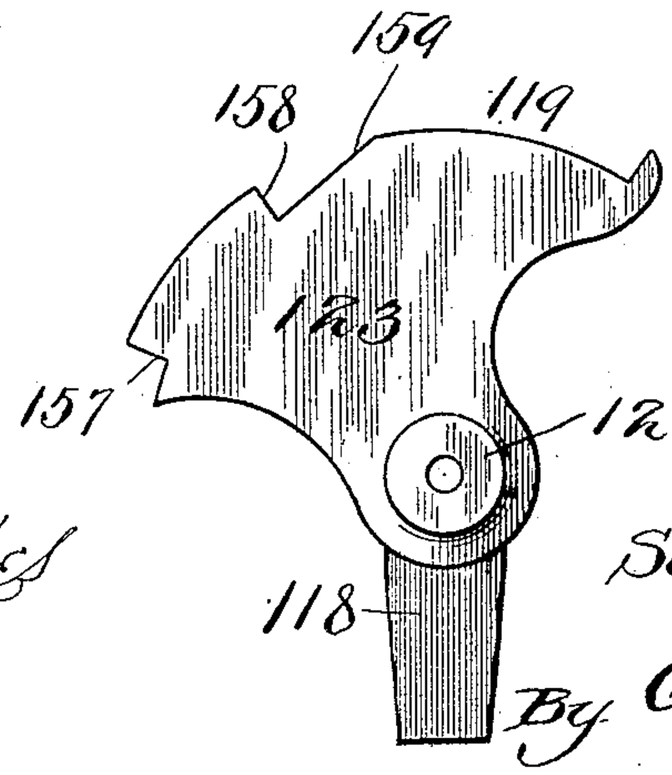

Fig 19

Witnesses
W. C. Coolidge
Wm. Geiger

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Attys

No. 750,827. PATENTED FEB. 2, 1904.

S. K. DENNIS.

MOWING MACHINE.

APPLICATION FILED JULY 28, 1900.

NO MODEL. 11 SHEETS—SHEET 9.

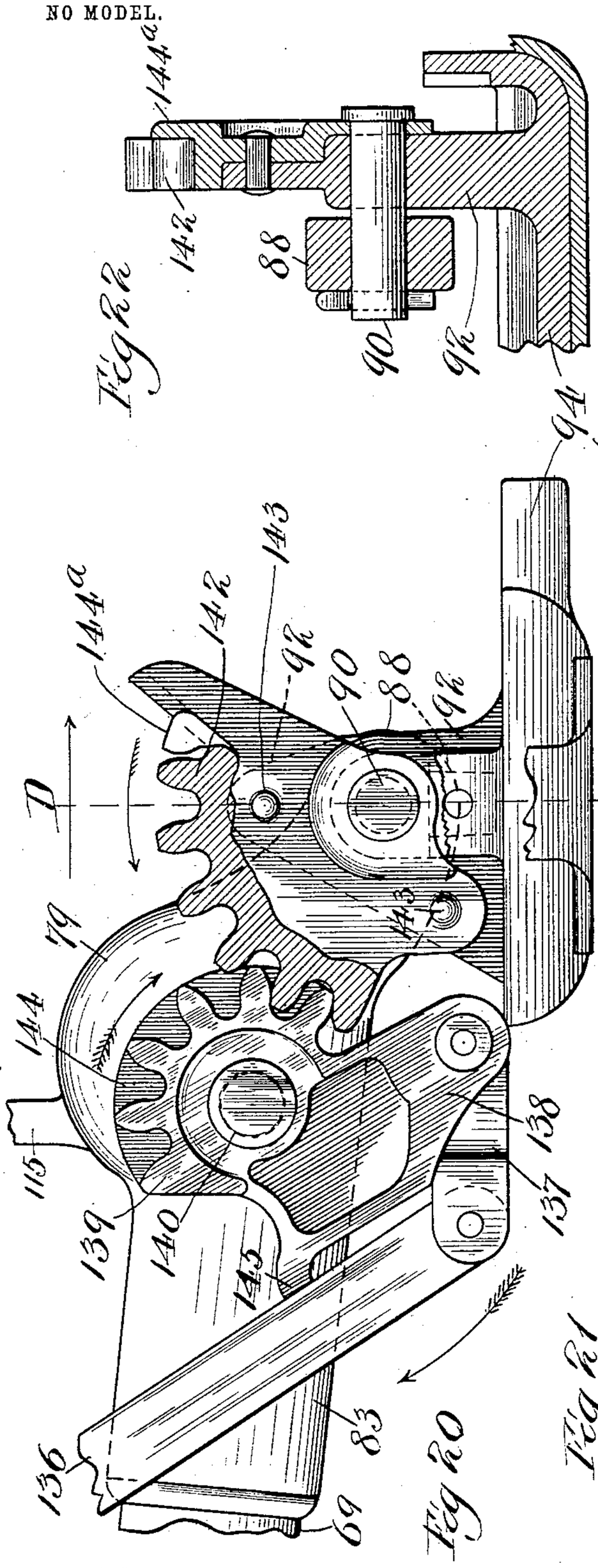

Fig 22

Fig 20

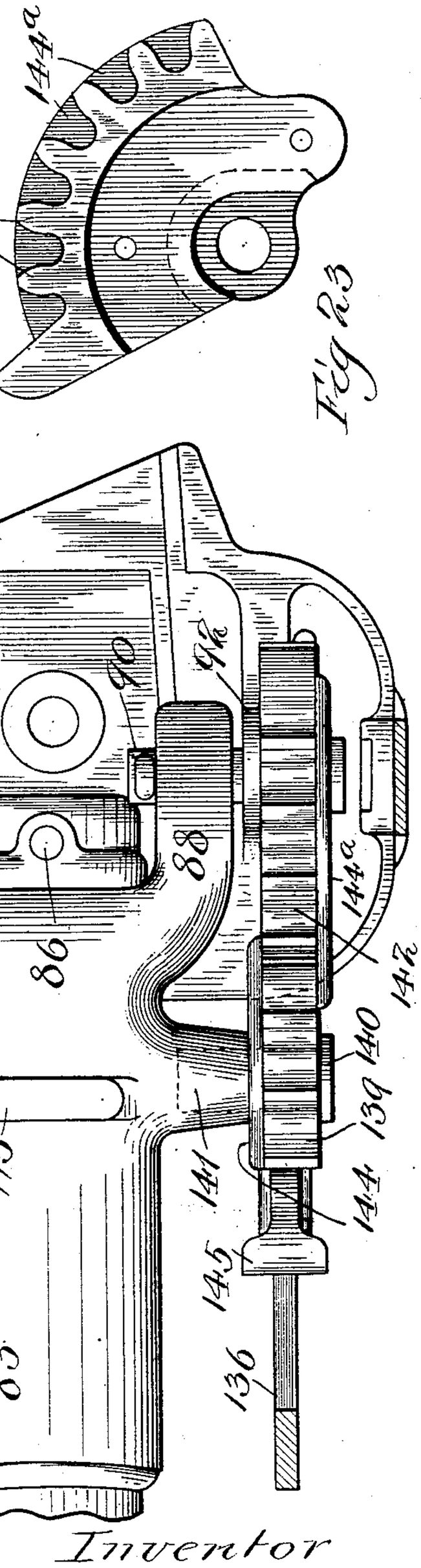

Fig 23

Fig 21

Witnesses,
W. C. Cockes
Wm. Geiger

Inventor
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By Coburn, Stibbens & McElroy
Attys

No. 750,827. PATENTED FEB. 2, 1904.

S. K. DENNIS.

MOWING MACHINE.

APPLICATION FILED JULY 28, 1900.

NO MODEL. 11 SHEETS—SHEET 10.

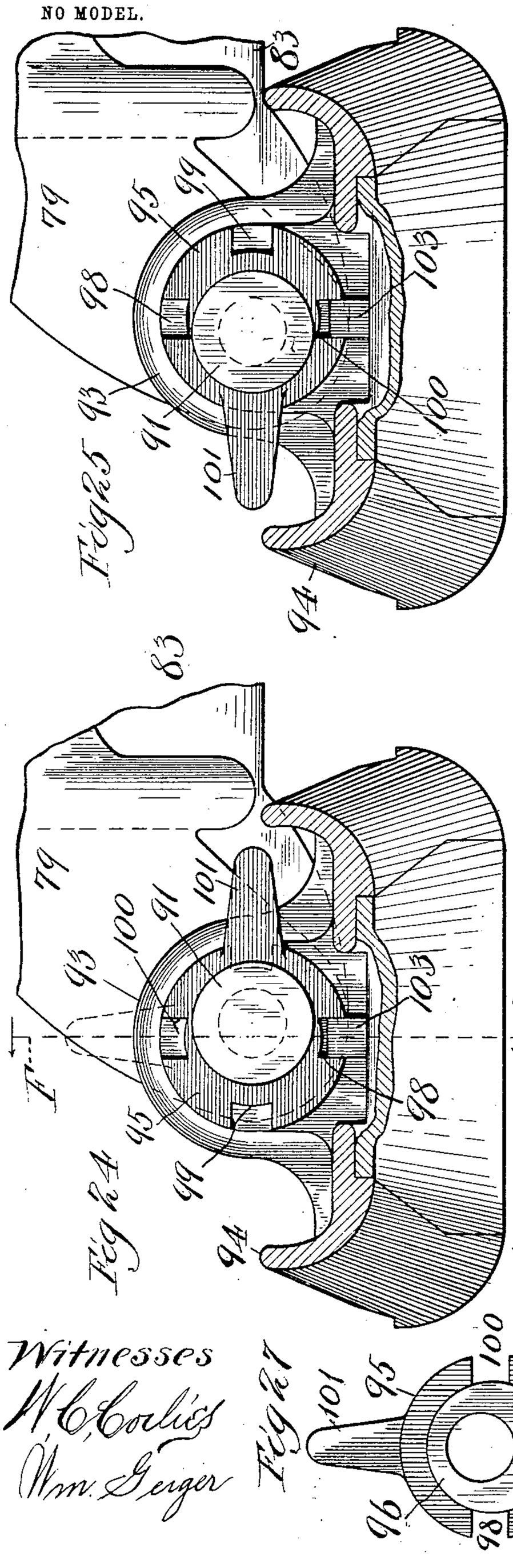

Fig 25

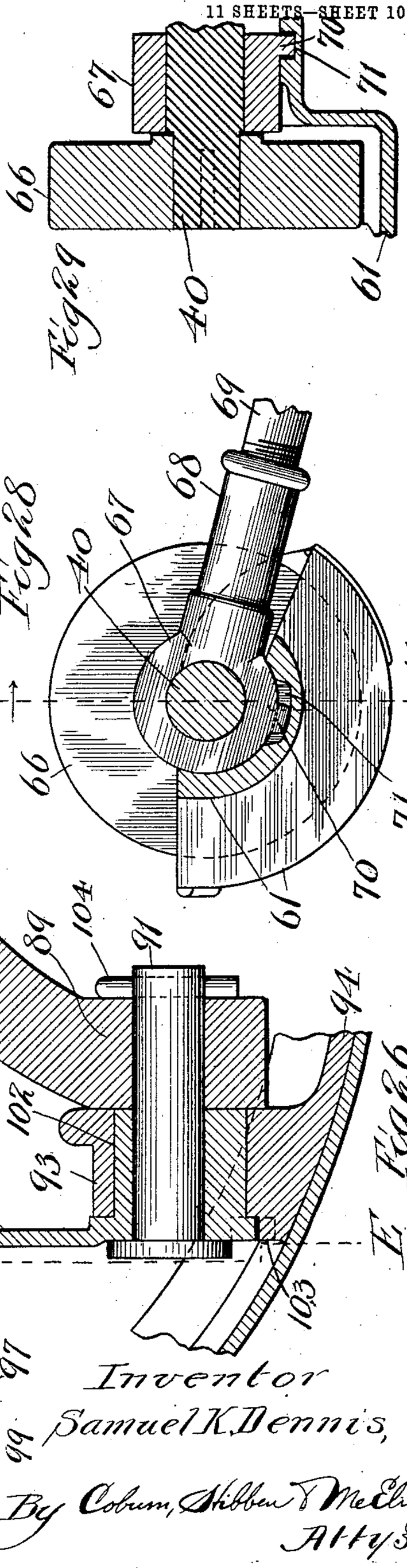

Fig 28

Fig 24

Fig 26

Fig 27

Witnesses
W. C. Corlies
Wm. Geiger

Inventor
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By Coburn, Stibbens & McElroy.
Attys

No. 750,827. PATENTED FEB. 2, 1904.

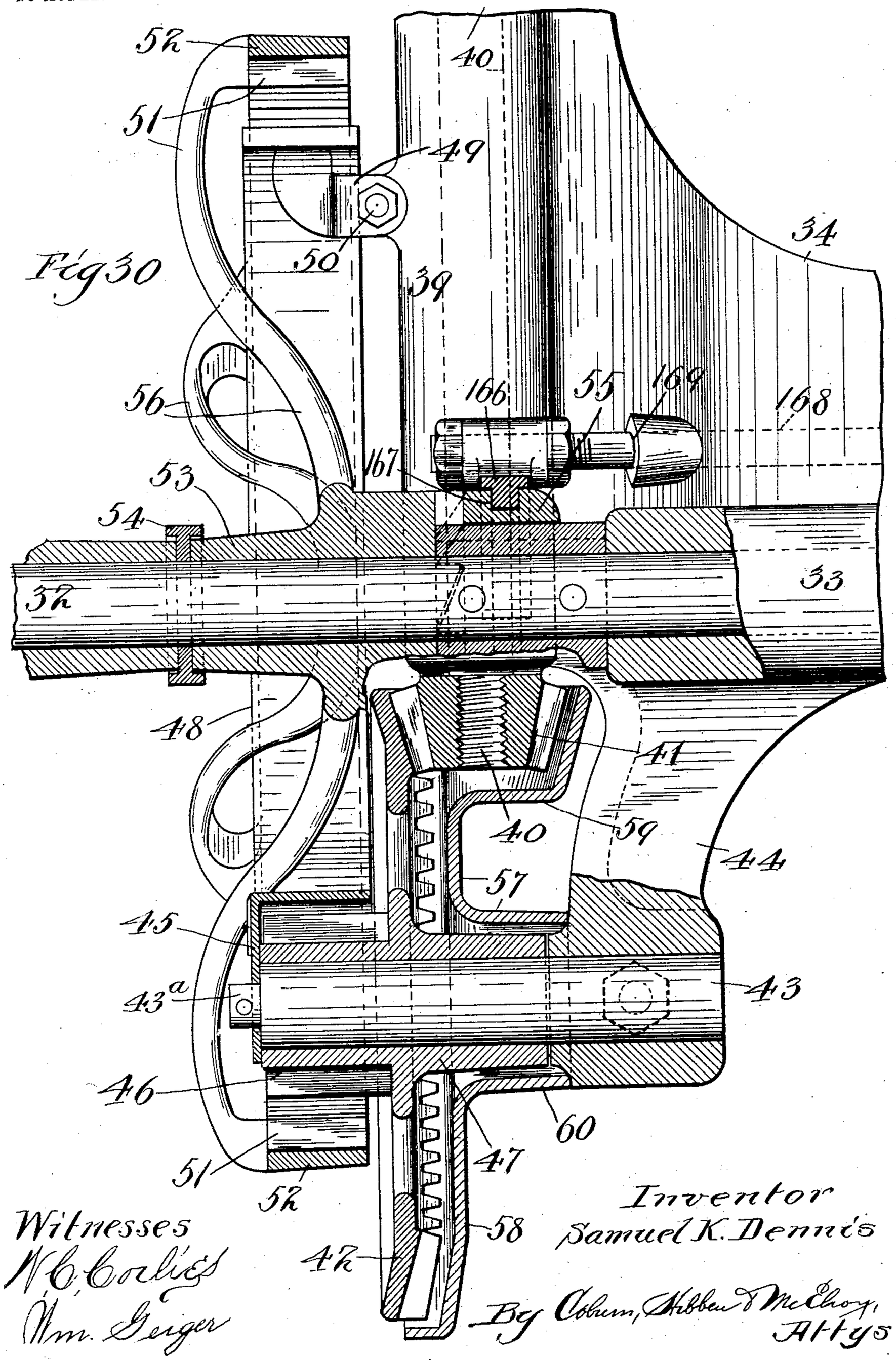
S. K. DENNIS.

MOWING MACHINE.

APPLICATION FILED JULY 28, 1900.

NO MODEL. 11 SHEETS—SHEET 11.

Fig 30



Witnesses
W. C. Curlis
Wm. Geiger

Inventor
Samuel K. Dennis

By Coburn, Hibben & McElroy,
Attys

No. 750,827. Patented February 2, 1904.

UNITED STATES PATENT OFFICE.

SAMUEL K. DENNIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE PLANO MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 750,827, dated February 2, 1904.

Application filed July 28, 1900. Serial No. 25,111. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL K. DENNIS, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mowing-Machines, of which the following is a specification.

My invention is concerned, first, with the draft appliances of mowing-machines and is designed to produce a draft apparatus which will automatically divide the draft in proper proportions between the main frame of the machine and the cutting apparatus pivoted thereto, so as to neutralize the tendency to side draft caused by the location of the cutting apparatus at one side of the machine. To procure this result, I employ a floating equalizing-bar or lever—*i. e.*, one having some or all of its bearing-points capable of movement to automatically vary the power applied through it to the parts to which it is connected—which is a novel element in the art and which furnishes the automatic adjustment required by reason of the fact that while it is centrally connected to the draft mechanism its ends are so connected to the main frame and to the cutting apparatus, respectively, that it is capable of adjusting itself automatically with respect to these parts, so as to correctly proportion the amount of draft that shall be given to each.

Another feature of my invention is the connection of the compensating spring to the lifting-crank at one end and to the draft mechanism at the other end, both of which are in turn connected to the cutting apparatus, so that the effect of the spring is to lift the cutting apparatus both at its front and at its rear ends, thus making a lighter draft for said cutting apparatus than has been possible heretofore where the compensating spring was connected to the cutting apparatus at only one end, as that connected to the lifting-crank.

Another feature of my invention is the novel form of adjustable pivotal connections between the coupling-frame and the finger-bar by which the angular relations thereof can be changed to take up any wear between them and to keep the finger-bar in proper alinement with the pitman-rod, which operates the cutter-bar.

Another feature of my invention is the specific connections employed between the lifting-crank and the finger-bar by which the movement of the lifting-crank serves to raise the finger-bar to bring it to vertical position when desired, as is the practice in what are known as "vertical lift" mowing-machines.

Another feature of my invention is the connections between the hand-lever and the notched segment with which it coöperates by which any violent movement of the hand-lever is prevented under the stress of the compensating spring in case the connections between the lifting-crank and the finger-bar or cutting apparatus should be broken.

Another feature of my invention is the specific mechanism employed for throwing the driving-gear automatically out of action when the finger-bar is raised.

Another feature is the mechanism for throwing the gearing out of action whenever it is desired.

Still other features of my invention are certain specific combinations of elements for purposes not enumerated above, but which will be specifically pointed out in the claims.

Referring to the accompanying sheets of drawings, in which the same reference characters designate identical parts in all the figures, Figure 1 is a plan view of the machine. Fig. 2 is an elevation of the stubble side of the machine with the driving-wheels omitted and some other parts broken away to more clearly illustrate the construction. Figs. 3 and 4 are a plan view and side elevation, respectively, of the detachable pitman-bearing cup. Fig. 5 is a rear elevation of the machine with a portion of the axle and frame broken away and in section to more clearly disclose the construction of some of the parts. Fig. 6 is a side elevation of a portion of the machine, showing the position of the parts when the sickle-bar is in horizontal position. Figs. 7, 8, and 9 are a plan view, front elevation, and rear elevation, respectively, of the inner-shoe connection. Fig. 10 is a view similar to Fig. 6, but with the parts moved to bring the finger-

bar into a vertical position. Fig. 11 is a rear elevation similar to Fig. 5, but with the grain-side wheel omitted and the parts in the same position as in Fig. 10. Fig. 12 is a plan view of a portion of the machine with the finger-bar and sickle in place, showing how their positions can be adjusted. Fig. 13 is a section through the finger-bar on the line A A of Fig. 12. Fig. 14 is a section on the line B B of Fig. 5. Fig. 15 is an end elevation of a portion of the frame. Fig. 16 is an enlarged plan view, partly in section, of a portion of the mechanism for throwing the sickle out of operation when the finger-bar is raised from horizontal position. Fig. 17 is a detail in section on the line C C of Fig. 16. Fig. 18 is a side elevation of the lifting-crank. Fig. 19 is a side elevation of the segment and bearing for the lifting-crank. Fig. 20 is an enlarged detail view, in rear elevation, showing the operation of the finger-bar-lifting segments with some of the mechanism broken away to more clearly disclose the operation. Fig. 21 is a plan view of the same mechanism. Fig. 22 is a sectional view on the line D D of Fig. 20. Fig. 23 is a front elevation of the lifting-gear segment detached from the inner shoe to which it is secured. Fig. 24 is a front elevation in section on the line E E of Fig. 26, showing the details of the mechanism for adjusting the position of the finger-bar. Fig. 25 is a similar view, but with the parts adjusted to another position. Fig. 26 is a sectional view of the same parts on the line F F of Fig. 24, but with the parts adjusted to the dotted-line position of said figure. Fig. 27 is a rear elevation detached of the adjusting-eccentric shown in Figs. 24 to 26. Fig. 28 is a detail view in section on the line G G of Fig. 1. Fig. 29 is a view of the same mechanism in section on the line H H of Fig. 28; and Fig. 30 is a plan view in section, on an enlarged scale, approximately on the line 30 30 of Fig. 2.

Referring to Fig. 1, it will be seen that, as is customary in these machines, there are two driving-wheels 31, which are secured by the customary one-way clutch mechanism (not shown) to the axle 32, extending between said wheels and journaled in the tubular portion 33 of the main frame 34. This main frame 34 has projecting rearwardly from the tubular portion 33 the flanged projection 35, which furnishes the seat to which the lower end of the seat-spring 36 is secured in the customary manner. Projecting forwardly from the tubular portion 33 is the flanged projection 37, which forms the seat to which the inner end of the tongue 38 is bolted in the customary manner. Secured to and forming a portion of the main frame is another elongated tubular bearing 39 at the stubble side of the machine and in a plane just below that of the tubular portion 33 and arranged at right angles thereto. This bearing 39 has mounted therein the eccentric-shaft 40, (see Fig. 30,) the rear end of which has secured thereto the bevel gear-pinion 41, which meshes with the bevel gear-wheel 42, which is mounted upon the bearing-shaft 43, one end of which is supported in the tubular bearing 44, projecting rearwardly from the main frame, and the other reduced end 43ª of which has secured thereon the cap-plate 45, which covers and protects the gear-pinion 46, which is formed integral with the sleeve 47, constituting the hub of the gear-wheel 42. The cap-plate 45 is formed with the long curved extension 48, the other end of which is provided with the lug 49, by which it is secured, by means of the bolt 50, to the tubular bearing 39 of the main frame. This extension 48 is of such a width and curve as to fit snugly over the teeth of the lower portion of the internally-toothed gear-wheel 51, which consists of the rim 52, having the gear-teeth on the inner side thereof meshing with the gear-pinion 46, and the hub 53, mounted upon the axle 32 between the collar 54 and the sliding clutch member 55, which is splined upon the shaft 32 in the customary manner. The rim 52 and the hub 53 are connected by the spokes 56, which I preferably make of the design shown in Fig. 30, and the right-hand end of the hub 53 has formed thereon the ratchet-teeth forming the stationary clutch member and adapted to engage with the similar-shaped teeth of the sliding clutch member 55. The gear-pinion 41 and the gear-wheel 42 are protected by the casing 57, which consists principally of the shallow cup-shaped portion 58, covering the gear-wheel 42, and the smaller but deeper cup-like portion 59, covering the gear-pinion 41, and the sleeve-like portion 60, surrounding the hub of the gear-wheel 42 and by which it is supported from the arm 44.

From the construction thus shown it will be seen that as the machine is moved forward if the clutch is in operation the gear-wheel 51, meshing with the gear-pinion 46, will, by means of the bevel gear-wheel 42 and the bevel-pinion 41, impart a rapid rotation to the eccentric-shaft 40. This construction with the interiorly-toothed gear-wheel secures a certain and powerful engagement between the gear-wheel and the gear-pinion and one in which there is no tendency to separate the intermeshing members as the strain upon the parts is increased. As will be pointed out farther on on page 5, the action of this driving mechanism is opposed to the draft applied to the frame, so that the opposing thrusts tend to cause the tongue of the machine to remain in any position to which it may be adjusted for draft purposes.

The forward end of the tubular bearing 39 has secured to the under side thereof the pitman-bearing cup 61, which, as will be best seen from the details in Figs. 3 and 4, consists of a short semicylindrical portion 62, which

has the flanges 63 at either side thereof provided with the apertures through which the bolts 64 pass to secure the cup to the corresponding and oppositely-disposed lugs 65, formed on the end of the tubular bearing 39. The eccentric-shaft 40 passes through this semicylindrical portion 62 and has loosely mounted thereon between the end of said portion and the eccentric-disk 66, which terminates the shaft, the collar 67, provided with the arm 68, having its hollow end interiorly screw-threaded to receive the main arm 69 of the coupling-frame. To prevent any tendency to displacement of the collar 67 and possible binding against the rotating eccentric-disk 66, I form the lug 70 on the under side of the collar 67 and I form the short segmental channel 71 in the bottom of the cup 61 in position to coöperate with this lug 70, so as to prevent any lateral movement of the collar, while at the same time permitting it to swing about the shaft 40 as an axis so far as may be necessary to permit of the customary movement of the coupling-frame. The main portion 72 of the cup 61 is substantially semicylindrical in shape and is of a sufficient size to receive the eccentric-disk 66 and permit its free rotation therein, together with its eccentrically-located bearing-pin 73, upon which the collar 74 is journaled, to which the inner end of the pitman 75 is pivotally secured in the customary manner. The regular contour of the side of the main portion 72 of the pitman-bearing cup is broken by the notch 76, formed therein to permit the passage of the pitman in its swinging movement, and it is provided at its forward end with an aperture 77, through which the curved end of the pitman guard-rod 78 passes, the other end of said rod being secured to the inner-shoe-connecting piece 79, (shown detached in Figs. 7 to 9 of the drawings,) which is secured to the other end of the rod 69. The brace-rod 80, constituting the other arm of the coupling-frame, is pivotally secured to the under side of the tubular portion 33 of the frame, as indicated by the dotted lines at 81 in Fig. 1, and its other end is screwed into an offset 82, formed on the lower end of the rod 69. The inner-shoe connection 79, as best seen in Figs. 1 and 6 to 9, consists of the hollow cylindrical portion 83, through which the lower end of the rod 69 passes and to which it is secured by the cap 84, (see Fig. 21,) having the flange 85 secured thereto by the pin 86, passing through ears formed on said cap and through the end of the rod. The yoke-shaped portion 87 of this inner-shoe connection terminates in the eyes 88 and 89, which coöperate with the pins 90 and 91, respectively, by which the connection is pivotally secured to the eyepieces 92 and 93, respectively, on the inner shoe 94. As will be seen from Fig. 22, the rear pivotal connection is of the ordinary construction; but the front connection, as best shown in Figs. 24 to 27, is of a somewhat different construction in order to provide for the adjustment of the outer end of the finger-bar if it is desired to advance it to compensate for the wear of the parts. The bearing-pin 91 instead of passing into a correspondingly-sized bearing in the eyepiece 93 passes into the eccentrically-located bearing-aperture in the adjusting-sleeve 95, which consists of the cylindrical body portion 96, provided with the flange 97, which has the three notches 98, 99, and 100 disposed therein at distances of substantially ninety degrees apart, together with the lug 101, which is formed opposite the central notch. The eye 93 has the cylindrical aperture 102 formed therein, which is of a diameter corresponding to the external diameter of the cylinder 96, which is fitted to rotate therein, and the bottom part of the shoe 94 has formed thereon and projecting upward therefrom the rectangular lug 103, which is of a shape to coöperate with one of the notches 98, 99, or 100, depending upon the position of adjustment of the parts. As the machine is first adjusted the parts are placed in the position shown in Fig. 24, in which it will be seen that the location of the eccentric adjusting-sleeve will throw the outer end of the sickle substantially in the position shown by the full lines in Fig. 12. After a certain amount of wear has taken place the eccentric adjusting-sleeve is moved to the position shown by the dotted lines in Fig. 24, this being the position of the parts shown in the section constituting Fig. 26, where the adjustment is such as to bring the finger-bar to a position half-way between that shown by the full lines and the dotted lines in Fig. 12, while upon further wear the sleeve can be adjusted to the position shown in Fig. 25, where it would occupy the dotted-line position, provided there had been no wear on the parts. Of course it will be understood that in making this adjustment the cotter-pin 104 is removed and the pin 91 slid out sufficiently to permit the adjusting-sleeve 94 to be also slid forward enough to disengage its notch from the lug 103, after which it can be adjusted to any of the positions desired.

Referring to Figs. 12 and 13, it will be seen that instead of the finger-bar being plain in cross-section I have made it curved downwardly at its rear edge, this construction being advantageous from the fact that by the use of the same weight of metal I am enabled to produce a finger-bar that offers greater resistance to bending strains than if the customary construction is employed.

To tilt the shoe, and consequently the finger-bar, to any desired angle, I employ a tilting-lever 105, which, as will be seen from Figs. 5, 6, 14, and 15, is bolted in the channel 106, formed in the metallic bearing 107 for said lever, which bearing consists of the annulus 108, which has the channel portion 106 and the lug 109 formed integral therewith

and which is mounted upon the short sleeve 110 cast on the end of the tubular portion 33 of the main frame. The annulus 108 rotates on this sleeve 110, and the lever is held in any desired position of adjustment by the customary spring-latch 111, mounted on the left-hand side thereof and coöperating with the teeth 112 of the segmental ratchet 113, formed on the outer end of the tubular portion 33 of the main frame. The wheel 31 being mounted on the axle 32 immediately adjacent the sleeve 110 holds the parts in position, and the simple and inexpensive bearing for this tilting-lever is thus secured. The link 114 is pivotally connected to the lug 109 and to another lug 115, projecting upward some distance from the inner-shoe connection, so that it will be readily seen that as the tilting-lever is moved to any position of adjustment the shoe 94 will be adjusted to the desired angle.

As will be seen in Fig. 12, I provide a substantially rectangular lug 116, projecting outwardly from the right-hand side of the tongue-support 37, and in this lug is formed a square aperture 117, which is adapted to receive the square downwardly-projecting lug 118, formed on the under side of the lifting-crank support 119, which is shown detached in Fig. 19. This lifting-crank support has the hollow cylindrical bearing-stud 120 formed thereon, upon which is journaled the hollow cylindrical axle 121 of the lifting-crank 122, and this support 119 is also provided with the notched segment 123, with which the spring-catch 124 of the lifting-crank coöperates. A bolt 125, passing through the center of the bearing-stud 120, coöperating with the washer 126, serves to secure the lifting-crank from lateral displacement. This lifting-crank is provided with the customary handle 127, which is conveniently located with reference to the driver's seat, and a foot-lever 128 is also employed to coöperate with this lifting-crank, this foot-lever, as will be best seen from Figs. 10 and 16 to 18, being pivotally secured, as at 129, in a slot 130, formed in the arm 131 of the lifting-crank. The width and angles of the sides of the aperture 130 are such that the foot-lever 128 has a certain amount of play relative to the lifting-crank, the play being desirable so that the foot-piece 132 can normally be in convenient reach of the foot without having to give too great a curvature to the lever 128, so as not to interfere with the axle when the lifting-crank is swung to its rearmost position, as shown in Fig. 10, by the hand-lever 127. In the normal operation of these machines the foot-lever is used when it is desired to merely lift the shoe and the finger-bar slightly without swinging the finger-bar from the horizontal, while the hand-lever 127 is brought into play when it is desired to not only lift the shoe, but also to swing the finger-bar to the vertical position. (Shown in Fig. 10.) The lifting-crank is provided with the forwardly-projecting arm 133, which terminates in the hook 134, to which is secured the connecting-link 135, which in turn is pivotally secured to the gag-lever 136, which is of the shape best shown in Fig. 5 and which in turn has its lower end pivotally secured to the short link 137, which in turn has its other end pivotally secured to the arm 138 of the pivoted gear-segment 139, which is mounted upon a bearing-stud 140, secured in the lug 141, projecting rearwardly from the inner-shoe connection 79. The teeth of this gear-segment 139 mesh with the teeth of the gear-segment 142, which is secured, as by the bolts 143, upon the eye-lug 92, projecting upwardly from the rear portion of the shoe 94. The gear-segments 139 and 142 are provided adjacent to their teeth with the flanges 144 and 144ª, respectively, which, as will be seen from Fig. 21, coöperate with the teeth of the segments to prevent their lateral displacement. It will be evident that as the swinging gear-segment 139 is moved in the direction of the arrow in Fig. 20 the corresponding movement of the segment 142, fixed upon the shoe will cause it to rotate, and thus swing the shoe about the bearing-pins 90 and 91 as an axis, until the finger-bar is carried into the vertical position. (Shown in Fig. 10.)

The gag-lever 136 during the first part of the upward movement caused by the action of the lifting-crank coöperates with a fulcrum-lug 145, formed upon the arm 138 of the pivoted gear-segment 139 until said segment is rotated sufficiently so that the power must be applied directly by lift through the gag-lever 136 and the link 137. It will also be apparent that the farther down the outer end of the finger-bar is the more nearly the gag-lever 136 and the arm 138 tend to become parallel and increase the nearness to the end of the gag-lever 136 of the point at which the fulcrum 145 coöperates with said lever, thus giving the greatest leverage at the time when it is needed most—*i. e.*, when the weight of the finger-bar is most disadvantageously disposed and reducing the leverage given to the gag-lever 136 when the weight of the finger-bar is more favorably disposed.

The doubletrees 148 are pivotally secured in the yoke 147, formed in the block 146, which in turn is pivotally secured, by means of the yoke 149, to the tongue 38 by the bolt 150. Above the bolt 150 is formed an eye-lug 151, through which passes an eyebolt 152, to which is secured the customary strong coiled equalizing-spring 153, the other end of which is hooked into one of the apertures 154, formed in the curved end of the link 155, the other end of which is pivoted to the arm 131 of the lifting-crank 122, as at 156. By reference to Fig. 6 it will be seen that as the spring 153 is secured in one of the holes 154 nearer to or farther from the end of the link 155 the spring

will when the parts are in the normal position (shown in Fig. 6) act at a greater or less advantage upon the lifting-crank, tending to counteract the weight of the shoe and its connected parts, which is opposed thereto, thus enabling me by different adjustments to employ the same strength of spring for different lengths of finger-bars. The action of these parts will be readily apparent, as it will be seen that when they are in their normal position (shown in Fig. 6) if it is desired to raise the coupling-frame and the shoe and its connected parts slightly without turning the finger-bar sufficient pressure can readily be applied to the end of the foot-lever to accomplish this purpose, the hand-lever 127 swinging idly over the unnotched portion of the segment 123. If it is desired to lift the coupling-frame and shoe and turn the finger-bar to the vertical for transportation purposes, the hand-lever is seized and the lifting-crank is swung backward until the parts are in the position shown in Fig. 10, where they can be held by allowing the spring-plunger upon the hand-lever 127 to engage with the notch or shoulder 157, formed at the end of the segment 123. As the normal tension of the spring 153 tends to swing the hand-lever 127 rearwardly against the weight of the coupling-frame and finger-bar to prevent any swinging of the hand-lever entirely back in case any accident should occur to release the connections between the lifting-crank and the shoe, which accidental movement might work serious injury to the occupant of the seat, I provide the shoulder 158, which has the gentle incline 159 leading thereto on the segment 123, and it will be apparent that if the hand-lever is thus moved back unintentionally its spring-plunger 124 will contact with the shoulder 158 and prevent the hand-lever from going back far enough to do any damage.

In order to automatically equalize so far as may be the draft upon the machine, I employ the draft-equalizing lever 160, which is of the shape best shown in Figs. 1 and 6 and which has its uppermost end connected by the link 161 to the lug 162, projecting downwardly from the tubular portion 33 of the main frame near the right-hand end thereof. The other end has the eye 163 thereon, which is passed over the rod 78, previously referred to as protecting the pitman, while substantially at its central portion it has pivotally secured thereto the draft-link 164, the other end of which is pivotally secured to the eye 165, formed on the rear side of the block 148. It will be apparent that as the coupling-frame rises and falls or the stress upon the parts varies the end of the equalizing-lever 160 can slide along the rods 78 and the lever as a whole can tilt to any position that may be necessary to accommodate the machine to the varying conditions of its draft.

As will be readily perceived by reference to Fig. 6, the draft applied to the doubletrees 148 will in part be transmitted through the link 164, equalizing-lever 160, and link 161 to the lug 162, secured to the under side of the frame, thus tending to turn the frame, and thereby raise the tongue, whereas the tendency of the action of the gear-driving mechanism, as will be best seen from Fig. 2, is to lower the tongue, these two forces thus tending to equalize each other and hold the tongue automatically in the natural draft position.

It is desirable in machines of this class to throw the sickle out of action automatically when the finger-bar is moved to a vertical position, and to effect this result I secure the clutch-shifting yoke 166, which coöperates with the annular groove 167 in the sliding clutch member 55, to the sliding bar 168, which is secured in the bearings formed where it passes through the main frame at 169 and in the bearing formed by the downwardly-projecting lug 170, through an aperture of which the rod is passed. A helically-coiled expanding spring 172 surrounds the portion of the rod 168 between the bearing-lug 170 and the collar 173, formed on the rod, so as to normally hold the parts in their clutched position. The outer end of the rod is pivotally secured to one end of the cam-lever 174, which is pivoted to the under side of the tongue-support, as at 175, and which has its free end 176 in position to be struck by the cam-surface 177, formed on the outer end of the arm 131 of the lifting-crank 122, when said lifting-crank is swung to its rearmost position. The relative position and adjustment of the cam-surface and the cam-lever is such that the rod 168 is pulled to the right to unclutch the driving mechanism before the finger-bar is tilted sufficiently to cause any binding of the pitman and the finger-bar. When the lifting-crank is returned to its normal position, the spring 172 acts to throw the clutch members together, so that as the machine moves on the sickle is thrown into operation again. If the driver leaves the machine and desires to throw the sickle out of operation without raising the finger-bar to a vertical position, I provide the cam-lever 178, which is pivoted to the lug 179, projecting upwardly from the collar 173, through a slot 180, formed in the main frame of the machine. This cam-lever 178 is eccentrically pivoted as to the curved body portion 181 of the lever, so that when the lever is swung from the full-line position of Fig. 5 to the dotted-line position of Fig. 11 the body portion 181 of the lever coöperating with the left-hand edge of the slot 180 will serve to slide the rod 168 to the right far enough to unclutch the machine, the parts remaining in this position until the lever 178 is intentionally thrown back to its normal position.

While I have shown the various features of

my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that they are capable of modifications in form and structure without departing from the spirit thereof and that I do not desire to be limited in the interpretation of the following claims, except as may be necessitated by the state of the art.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a mowing-machine, the combination with the coupling-frame, of the finger-bar secured thereto by pivotal connections, said pivotal connections comprising two bearings alined transversely to the length of the bar, one of said bearings consisting of an eccentric sleeve, and means for rotating said sleeve and securing it in any desired position.

2. In a mowing-machine, the combination with the coupling-frame, of the finger-bar secured thereto by pivotal connections, said pivotal connections comprising two bearings alined transversely to the length of the bar, one of said bearings consisting of a sleeve with an eccentric aperture therein, and means for rotating said sleeve and securing it in any desired position consisting of the flange 97 having the notches therein adapted to coöperate with the lug 103 rigid with the finger-bar.

3. In a mowing-machine, the combination with the coupling-frame, of the finger-bar pivotally secured thereto, a segmental gear secured to said finger-bar concentrically with its pivot, another gear meshing with said segmental gear and carried by said supporting member, and means for moving said last-mentioned gear comprising a pivoted arm having link connections with said last-mentioned gear, said link connections consisting of the centrally-disposed gag-lever and the links connecting it to said arm and the gear respectively.

4. In a mowing-machine, the combination with the coupling-frame, of the finger-bar pivotally secured thereto, a segmental gear secured to said finger-bar concentrically with its pivot, another segmental gear having the lug 145 thereon meshing with said first-mentioned gear and journaled on the coupling member, and means for swinging said last-mentioned segmental gear comprising a pivotal arm having link connections therewith consisting of the centrally-disposed gag-lever coöperating with said lug 145 on the gear and the links connecting it to said arm and gear respectively.

5. In a mowing-machine, the combination with the lifting-crank having the arm 133, of the pivoted lifting member, as the segmental gear 139 having the bearing-lug 145 and the arm 138 and pivoted to the coupling-frame, and the link connections between the arm 133 and the arm 138 consisting of the link 135 secured to the arm 133, the gag-lever 136 arranged to coöperate with the lug on the arm 138, and the link 137 connecting the gag-lever and said arm 138.

6. In a mowing-machine, the combination of a hand-lever, a spring coöperating therewith and constantly tending to throw said hand-lever toward the driver's seat, a segment adjacent to said lever and provided with a notch consisting of an inclined surface leading to an abrupt shoulder facing away from the driver's seat, and a plunger on said hand-lever adapted to coöperate with said notch, substantially as and for the purpose described.

7. In a mowing-machine, in combination a pivoted hand-lever having a plunger, a spring coöperating with said hand-lever and constantly tending to throw it toward the driver's seat, and a fixed segment adjacent said lever and provided with two notches, one consisting of an inclined surface leading to the abrupt shoulder facing away from the driver's seat, and the other having the abrupt shoulder opposed to the shoulder of the other notch.

8. In a mowing-machine, the combination of the frame having a slot therein, and having the axle mounted therein, with the driving-wheels clutched on said shaft, a sliding clutch member splined on the axle, a gear-wheel mounted to rotate on said axle and having the fixed clutch member secured thereto, a clutch-shifting mechanism comprising a yoke engaging the sliding clutch member, a sliding bar connected to said yoke and mounted substantially parallel to the axle, a spring coöperating with the sliding bar, and means to hold the clutch members out of engagement consisting of the cam-lever pivotally secured to the bar in a bearing-lug and coöperating with the edge of said slot in the frame through which said bearing-lug for the cam-lever reciprocates.

9. In a mowing-machine, the combination of the axle, with the driving-wheels clutched thereon, a sliding clutch member splined on the axle, a gear-wheel mounted to rotate on said axle and having the fixed clutch member secured thereto, a clutch-shifting mechanism comprising a yoke engaging the sliding clutch member, a sliding bar connected to said yoke and mounted substantially parallel to the axle, a spring coöperating with the sliding bar, a lever pivoted to the frame and having one end connected with the sliding bar, and a lifting-crank pivotally mounted on the frame and having an arm thereon adapted to contact with the free end of the lever.

10. In a mowing-machine, the combination of the axle, with the driving-wheels clutched thereon, a sliding clutch member splined on the axle, a gear-wheel mounted to rotate on said axle and having the fixed clutch member secured thereto, a clutch-shifting mechanism comprising a yoke engaging the sliding clutch member, a sliding bar connected to said yoke and mounted substantially parallel to the axle, a spring coöperating with the sliding bar, a

lever pivoted to the frame and having one end connected with the sliding bar, a lifting-crank pivotally mounted on the frame and having an arm thereon adapted to contact with the free end of the lever, a hand-lever secured to said lifting-crank and a foot-lever pivotally secured thereto.

11. In a mowing-machine, the combination with the main frame having a tubular bearing 39, and the coupling-frame secured thereto, of the shaft 40 having the eccentric-disk 66 on the end thereof, the cup 61 secured to the end of the bearing 39 and having the channel 71 therein, and the sleeve 67 connected with the coupling-frame surrounding the shaft 40 and having the lug 70 coöperating with the channel 71.

12. In a mowing-machine, the combination with the main frame having an angular socket 117 therein, of a lifting-crank-supporting member comprising the angular lug 118 adapted to coöperate with the socket 117, the cylindrical bearing 120, and the notched segment 123.

13. In a mowing-machine, the combination with the main frame having an angular socket 117 therein, of a lifting-crank-supporting member comprising the angular lug 118 adapted to coöperate with the socket 117, the cylindrical bearing 120, a notched segment 123, and the lifting-crank mounted thereon comprising the bearing-sleeve 121 and the arms 127, 131 and 133, respectively.

14. In a mowing-machine, the combination with the main frame having an angular socket 117 therein, of a lifting-crank-supporting member comprising the angular lug 118 adapted to coöperate with the socket 117, the cylindrical bearing 120, the notched segment 123, the lifting-crank mounted thereon comprising the bearing-sleeve 121 and the arms 127, 131, respectively, the cap-piece 126, and the bolt 125 passing through the cylindrical bearing 120.

15. In a mowing-machine, the combination with the frame having a tongue secured thereto, of the block 146 pivotally secured to the tongue and carrying the doubletrees, the spring 153 secured thereto above the pivot, the floating lever 160 slidingly mounted at one end so as to be capable of receding from and approaching the inner shoe connection, and the links 161 and 164 pivotally connected at one end to the frame and the block 146, respectively, and at the other end to the floating lever 160.

16. In a mowing-machine, the combination with the frame having a tongue secured thereto, of the block 146 pivotally secured to the tongue and carrying the doubletrees, the spring 153 secured to said block above the pivot and having its other end connected to the frame of the machine, the pitman guard-rod 78 extending in front of the machine, the inner shoe connection suitably supported from the frame and having the rod 78 connected thereto, the floating lever 160 having one end slidingly mounted on the rod 78, and the links 161 and 164 each pivotally connected at one end thereof to the frame and the block 146, respectively, and at their other ends to the floating lever 160.

17. In a mowing-machine, the combination with the main frame, of the coupling-frame secured thereto, the finger-bar pivoted to the coupling-frame, the lifting-crank, connections between the lifting-crank and the finger-bar including the gag-lever 136, and means connecting the lever and the finger-bar, said means causing the lever to act as a lever during the first part of the upward movement of the bar, and during the continued upward movement of the bar causing it to act as a link.

18. In a mowing-machine, the combination with the main frame, of the coupling-frame secured thereto, the finger-bar pivoted to the coupling-frame, the lifting-crank, connections between said lifting-crank and finger-bar including the gag-lever 136, a fulcrum-carrying arm pivoted on the coupling-frame and connected to the finger-bar to move therewith, and a link pivotally connected to the gag-lever and to the fulcrum-carrying arm, whereby the gag-lever bears on the fulcrum during the first part of the upward movement of the bar and acts as a lever, and during the continued upward movement of the bar the lever moves out of contact with the fulcrum and acts as a link.

19. In a mowing-machine, the combination with the main frame, of the coupling-frame secured thereto, the finger-bar pivoted to the coupling-frame, the lifting-crank, and connections between said lifting-crank and finger-bar including a member pivoted on the coupling-frame and coöperating with a fixed portion of the finger-bar, so that the finger-bar is raised as said member is rocked on its pivot, and having a projection 145 thereon, the link 137 connected to said pivoted member, and the gag-lever 136 connected to said link 137 and adapted to coöperate with the projection 145 as a fulcrum as the finger-bar is raised.

20. In a mowing-machine, the combination with the main frame, of the coupling-frame secured thereto, the finger-bar pivoted to the coupling-frame, the lifting-crank, and connections between said lifting-crank and the finger-bar including the gear-segment secured to the pivoted end of the finger-bar, the coöperating gear-segment pivoted on the coupling-frame and having the projection 145 thereon, the link 137 pivoted to said gear-segment, the gag-lever 136 pivoted to said link 137 and adapted to coöperate with the projection 145 as a fulcrum, and the link connecting the gag-lever 136 with the lifting-crank.

21. In a mowing-machine, the combination with the main frame, of the cutting apparatus pivotally secured thereto, a compensating spring, and connections between both ends of said compensating spring and the cutting ap-

paratus whereby the cutting apparatus is connected to said compensating spring at both ends thereof so as to be yieldingly supported thereby.

22. In a mowing-machine, the combination with the main frame, of the cutting apparatus pivoted thereto, the lifting-crank pivoted on the main frame, the draft-supporting member movably connected to the tongue, the compensating spring connected at one end to the lifting-crank and at the other end to the draft-supporting member, connections between the cutting apparatus and the lifting-crank, and connections between the draft-supporting mechanism and the cutting apparatus.

23. In a mowing-machine, the combination with the main frame, of the cutting apparatus pivoted thereto, the lifting-crank pivoted on the main frame, the draft-supporting member movably mounted on the tongue, the compensating spring secured to the lifting-crank at one end and to the draft-supporting mechanism at the other end, connections between the lifting-crank and the cutting apparatus, and connections between the draft-supporting mechanism and the cutting apparatus including the link 164 and the automatically-adjustable equalizing-bar 160.

24. In a mowing-machine, the combination with the main frame, of the cutting apparatus pivotally secured thereto, and draft apparatus for automatically adjusting the draft between the main frame and the cutting apparatus, said draft apparatus including the floating equalizing-bar connected at one end ultimately to the main frame and at the other to the cutting apparatus and having a connection between its ends to the doubletree.

25. In a mowing-machine, the combination with the main frame, of the cutting apparatus pivotally secured thereto, the draft-bar movably secured to the tongue, the floating equalizing-bar, a link connecting one end of said equalizing-bar and the main frame, connections between the other end of said equalizing-bar and the cutting apparatus for automatically varying the effective point at which the draft is applied, cutting apparatus, and a second link secured at one end to the draft-bar and at the other end to the equalizing-bar.

26. In a mowing-machine, the combination of a yoke, and a finger-bar having separated relatively fixed attaching parts arranged one in advance of the other and connected independently to the yoke, the connection between the yoke and one of said attaching parts comprising a pivot, and means movable relatively to the pivot for moving said one of the attaching parts laterally relatively to the other attaching part and thereby forcing the outer end of the finger-bar forwardly or backwardly.

27. In a mowing-machine, the combination of a yoke, a finger-bar having separated relatively fixed attaching parts arranged one in advance of the other, means for connecting the yoke to one of the attaching parts, and means for connecting the yoke to the other attaching part independently of the former attaching part, said latter means comprising a pivot and an adjusting member supporting the pivot and movable relatively thereto for moving said other attaching part laterally relatively to the former attaching part and thereby forcing the outer end of the finger-bar forwardly or backwardly.

28. In a mowing-machine, the combination of a yoke, a finger-bar having separated relatively fixed attaching parts arranged one in advance of the other, means for connecting the yoke to one of the attaching parts, and an adjusting member pivotally connected to the yoke and to the other attaching part for moving said other attaching part laterally relatively to the former attaching part, and thereby forcing the outer end of the finger-bar forwardly or backwardly.

29. In a mowing-machine, the combination of a yoke, a finger-bar having separated attaching parts arranged one in advance of the other, substantially horizontal pivots for connecting said attaching parts independently to the yoke, said pivots being alined with each other, and means between one of the pivots and the corresponding attaching part for forcing the outer end of the finger-bar forwardly or backwardly without varying the alinement of said pivots.

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