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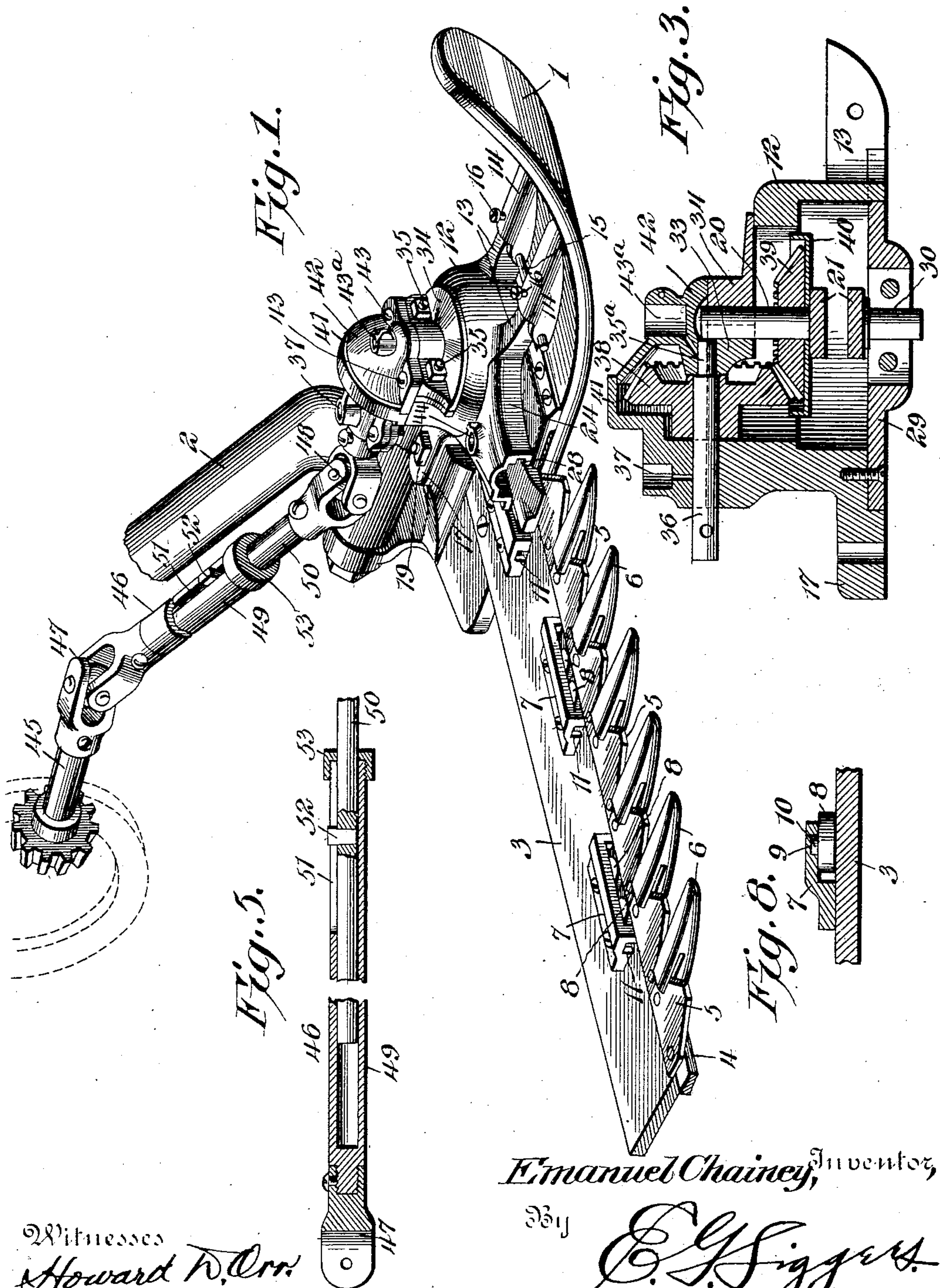
PATENTED FEB. 2, 1904.

E. CHAINEY.  
MOWING MACHINE.

APPLICATION FILED JULY 28, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
Howard W. Orr.  
Louis E. Julihn

Emanuel Chainey, Inventor,

By

C. J. Siggers

Attorney



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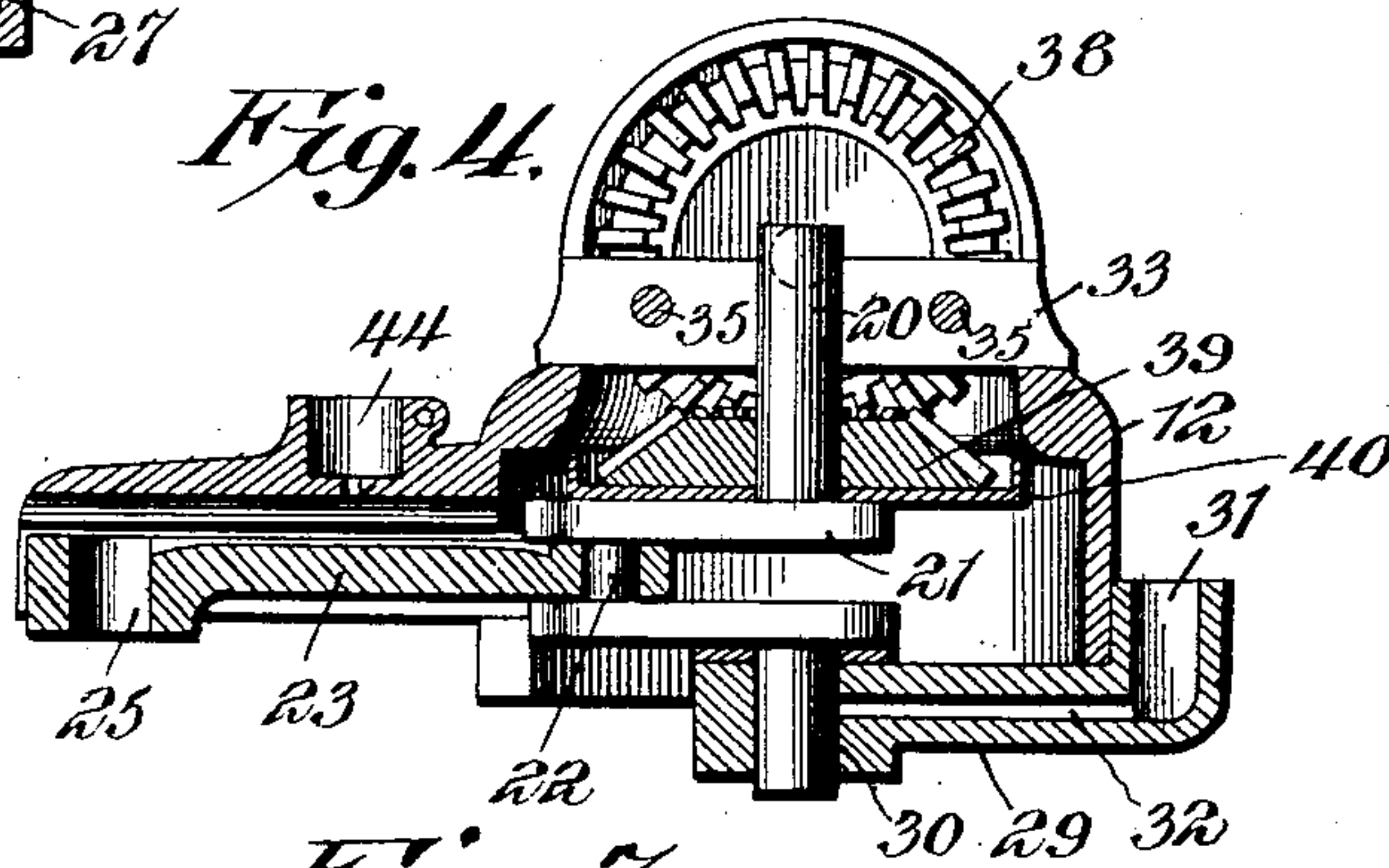
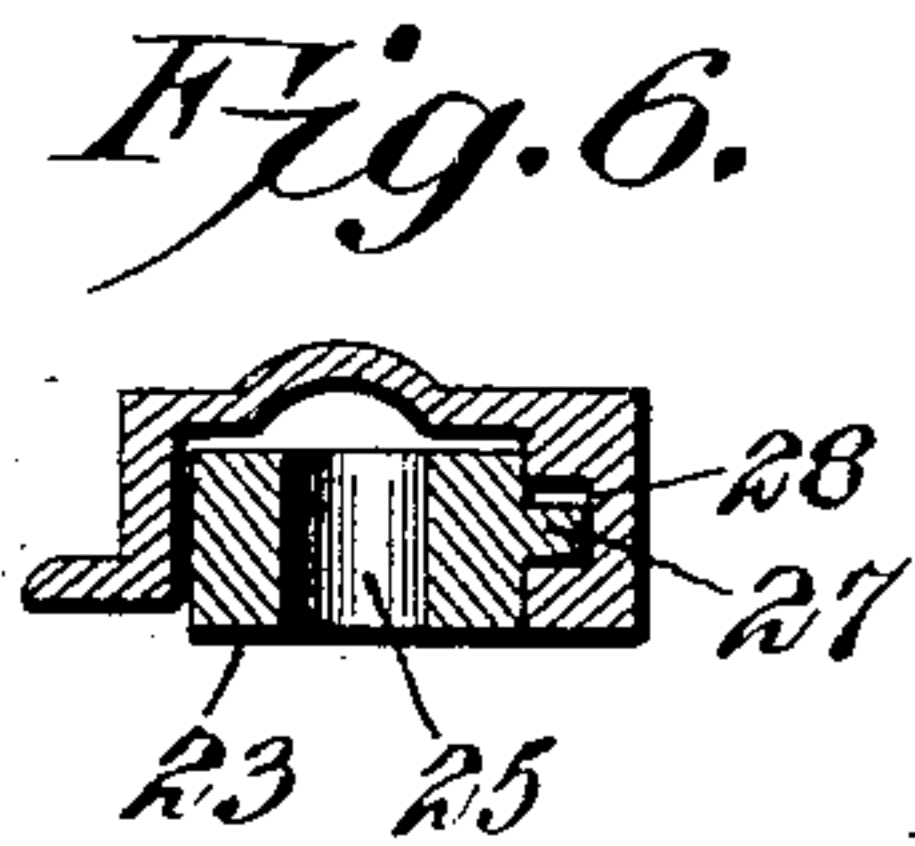
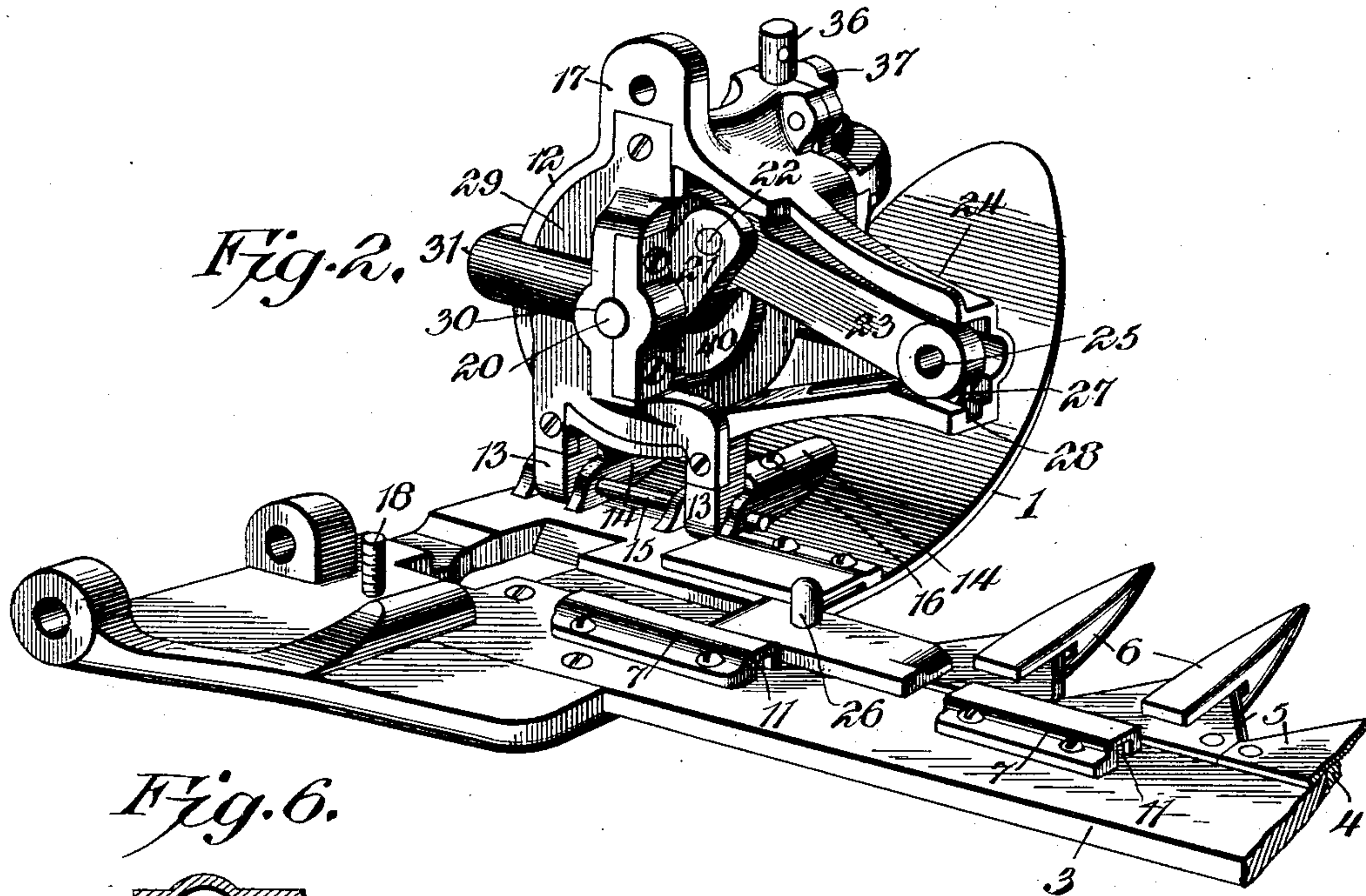
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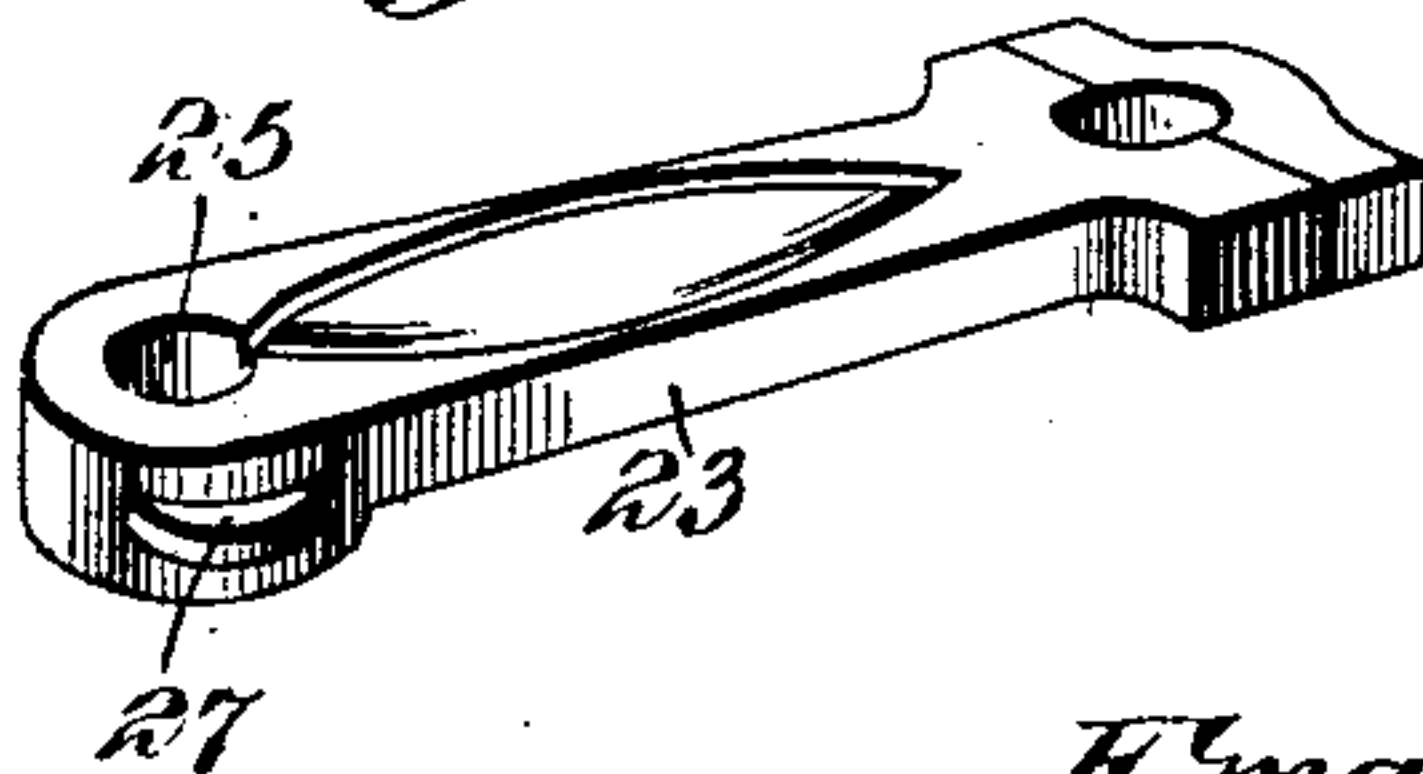
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2 SHEETS—SHEET 2.



*Fig. 7.*



Emanuel Chainey, Inventor,

By

C. G. Siggel

Attorney

Witnesses  
Howard W. Orr  
Louis G. Juelich



# UNITED STATES PATENT OFFICE.

EMANUEL CHAINEY, OF FLORENCE, WISCONSIN.

## MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 750,808, dated February 2, 1904.

Application filed July 28, 1903. Serial No. 167,338. (No model.)

*To all whom it may concern:*

Be it known that I, EMANUEL CHAINEY, a citizen of the United States, residing at Florence, in the county of Florence and State of Wisconsin, have invented a new and useful Mowing-Machine, of which the following is a specification.

This invention relates to improvements in mowing-machines of that type characterized by a shoe supported by an extension of the frame structure and from which extends in a lateral direction a finger-bar and a reciprocating cutter-bar, the latter being arranged for reciprocation by the advance of the machine through the medium of gearing interposed between one of the vehicle-wheels and the bar.

The object of the invention is to simplify and improve the cutter-bar mounting and the mechanism for operating said bar for the purpose of minimizing the counteraction between the cutter-bar and the frame of the machine, thus reducing the wear on the various machine elements and the strain on the draft-animals.

Another object of the invention is to mount the principal portion of the operating mechanism upon the shoe in order to provide a solid foundation therefor and to effect a connection between the operating mechanism and the driving-wheel by an extensible shaft, which will accommodate itself to the movement of the shoe and cutter-bar.

A further object is to operate the cutter-bar by means of a crank rotating in a horizontal plane in order to eliminate the pounding which is incidental to the use of an operating-crank moving in a vertical plane.

A still further object is to mount the various operating connections within a dust-proof housing or casing mounted on the shoe and capable of being swung back to facilitate cleaning, adjustment, and repair without material disorganization of the parts.

Further and subordinate objects will appear during the course of the succeeding description of the illustrated structure.

In the accompanying drawings, Figure 1 is a perspective view of so much of a mowing-machine as is necessary for the illustration of the invention. Fig. 2 is a perspective view showing the gear-case raised. Fig. 3 is a ver-

tical longitudinal section through the gear-case. Fig. 4 is a vertical transverse section of the same subject-matter. Fig. 5 is a sectional elevation of the extensible power-transmitting shaft. Fig. 6 is a detail sectional view showing the manner in which the outer end of the pitman is guided in the gear-case extension. Fig. 7 is a detail view of the pitman, and Fig. 8 is a detail sectional view through one of the roller-bearings of the cutter-bar.

Like numerals of reference designate corresponding parts throughout the several views.

The shoe 1 is supported, as usual, by an arm 2, the character of the connection being such that the finger-bar 3, rigidly connected to and extending laterally from the shoe, may be swung up or down, as the exigencies of use demand. At the front edge of the finger-bar is mounted for reciprocation a cutter-bar 4, carrying the knives or cutters 5, which cooperate with and are guided in part by the fingers 6, extending forwardly from the bar 3. To promote the antifrictional movement of the cutter-bar, the finger-bar 3 is provided with a series of roller-brackets 7, (see Fig. 8,) having open front sides, at which are exposed antifriction-rollers 8, with which the rear edge of the cutter-bar contacts. These brackets 7 are located at intervals along the finger-bar, and each is designed to contain any desired number of rollers, which are permitted sufficient play or travel to accommodate the stroke of the cutter-bar. To prevent the displacement of the rollers 8 when the cutter-bar is removed, the upper walls of the brackets are formed with longitudinal grooves or channels 9 for the reception of small extensions or hubs 10, with which the rollers are provided at their upper sides. At the opposite ends of the brackets openings 11 are formed to permit any dust or dirt to be worked out by the movement of the rollers. The character of mounting just described insures the substantially frictionless movement of the cutter-bar, and I will now proceed to describe the operating mechanism whereby the cutter-bar is reciprocated through the advance of the mower without objectionable reaction between the frame and the bar.

Upon the shoe 1 is supported a gear-case 12, 100



inclosing a considerable portion of the cutter-bar-operating mechanism and designed to be swung back bodily from the position indicated in Fig. 1 to that shown in Fig. 2 for the purpose of effecting the disconnection of the cutter-bar preparatory to its removal—as, for instance, when it becomes necessary to sharpen the knives. This hinged mounting of the gear-case is effected by forming the latter with a pair of forwardly-extending ears 13, passed into sockets 14, formed in or upon the shoe 1 and retained in said sockets by a pintle 15.

When the gear-case is swung up, it may be retained in its elevated position by set-screws 16, screwed into the sockets 14 and disposed to bear upon the forward ends of the gears 13. At its rear side the case 12 is provided with an apertured lug 17 for the accommodation of a screw-bolt 18, upstanding from the shoe. When the case is swung down, the screw-bolt 18 projects through the lug 17, and upon its upper end is screwed a nut 19, which serves to hold the case rigidly in its depressed position. Within the gear-case is journaled a vertical crank-shaft 20, having a crank 21, to the wrist 22 of which is connected one end of a pitman 23, housed within a lateral extension 24 of the case. The outer end of the pitman 23 is provided with an opening 25, which when the case is swung down receives a pin 26, projecting upwardly from the inner end of the cutter-bar (see Fig. 2) to effect the operative connection of the crank-shaft and bar. When the case is swung up, however, the pitman 23 is withdrawn from the pin 26 to disconnect the parts, and in order to prevent binding of the pin 26 in the opening 25 of the pitman when this disconnection is effected the pitman is provided with a guide-flange 27, projecting laterally from its outer end and received within a guide-groove 28 in one of the side walls of the case extension 24. The engagement of this flange with the groove serves to guide the outer end of the pitman in its movement during the operation of the parts and also insures the movement of the pitman with the gear-case as the latter is swung up.

The lower end of the crank-shaft 20 is journaled in a detachable bottom plate 29 of the case 12, said plate being formed with a substantial bearing 30 and with an oil-cup 31, from which an oil-duct 32 is extended to the bearing to insure the proper lubrication thereof. The upper end of the shaft 20 is journaled in a bearing formed between a bearing-bar 33 and one side of a cover-plate 34, the plate and bar being detachably retained in place—as, for instance, by bolts 35. (See Fig. 1.) The bar 33 also affords a bearing for the reduced front end 35<sup>a</sup> of a short horizontal shaft 36, journaled adjacent to its opposite end in the rear wall of the case, said wall being formed with an oil-cup 37 for the lubrication of the rear bearing of the shaft 36. Upon the shaft 36 intermediate of its bearings is keyed

a beveled gear 38, meshing with a similar gear 39, keyed upon the crank-shaft 20 above the crank. Between the gear 39 and the crank is disposed a shallow oil-receptacle 40 of circular form designed to catch the waste oil from the upper bearing in the crank-shaft. This waste oil gradually overflows and is deposited upon the crank-bearing.

The upper portion of the rear wall of the case 12 is formed with a forwardly-extending rim 41, encircling the upper half of the gear 38, and a cap 42, secured as by screws 43, covers the adjacent ends of the shafts 20 and 36 and has a semicircular edge fitting within the rim 41 to completely incase the gear 38. The cap is formed with an oil-cup 43<sup>a</sup>, communicating through suitable ducts with the adjacent bearings of the shafts 20 and 36. To provide lubrication for the bearing-surfaces of the pin 26 and the pitman 23, the case extension 24 is formed with an oil-cup 44, having an apertured bottom, through which the oil drips upon the bearing as the cutter-bar reciprocates.

The shaft 36 receives its motion from a short shaft 45, geared either directly or indirectly to the vehicle-wheels (not shown) and connected to the shaft 36 by an extensible shaft 46, intermediate flexible joints 47 and 48 being provided in order to accommodate the relative movements of the parts. The extensible shaft 46 may be of any suitable construction; but a preferred form thereof is shown in Fig. 5. This form contemplates the construction of the shaft 46 in two telescoping sections 49 and 50, the former being of tubular form and provided with a longitudinal slot 51, into which extends a lug or key 52, carried by the section 50, a collar 53 being screwed upon the end of the section 50 to prevent the complete separation of the shaft-sections. It will be observed that the shafts 36, 45, and 46 constitute, in effect, a single flexible and extensible shaft, effecting an operating connection between the driving mechanism and the crank-shaft carried by the shoe to operate the cutter-bar.

Briefly, the operation of the device is as follows: As the mower is drawn over the ground rotary motion is communicated to the short shaft 36 and is transmitted through the gears 38 and 39 to the vertically-disposed crank-shaft 20. The crank 21 is thus rotated in a horizontal plane to effect the reciprocation of the cutter-bar through the intermediate pitman 23, it being observed that the rotation of the crank in a horizontal plane eliminates the objectionable downward thrust upon the cutter-bar which is incidental to the employment of a crank rotating in a vertical plane. Furthermore, this particular arrangement of the crank permits the thrust exerted upon the cutter-bar to be received by the roller-bearings carried by the finger-bar, and all counteraction of the operating connections instead of



being sustained by the draft-animals is absorbed by the relative movement of the sections 49 and 50 of the extensible shaft. If it is merely desired to remove the cutter-bar, it is simply necessary to remove the nut 19 and raise the gear-case slightly, the pitman being thus moved out of engagement with the pin 26. Such movement of the case is accommodated by the extensibility of the shaft 46. If in addition to or instead of the removal of the cutter-bar it is desired to obtain access to the mechanism within the gear-case, the shaft 36 may be disconnected from the shaft 46 and the case swung completely back to the position shown in Fig. 2. Any interior parts which in this position of the case are inaccessible may be easily reached by the removal of the cap 42, the cover-plate 34, or the bottom plate 29 of the case.

It is thought that from the foregoing the construction and operation of my improvement in mowers will be clearly understood; but while the present embodiment of the invention is thought at this time to be preferable I reserve to myself the right to effect such changes, modifications, and variations as may fall fairly within the scope of the protection prayed.

What I claim as new is—

1. In a mower, the combination with the frame, shoe and cutter-bar; of a crank-shaft, a pitman connecting the shaft and cutter-bar, and a movable member mounted on the shoe and operatively connected to the pitman to move the same out of engagement with the cutter-bar.

2. In a mower, the combination with the frame, shoe and cutter-bar; of a crank-shaft, a pitman connecting the crank-shaft and cutter-bar, and a swinging member mounted on the shoe and constituting a support and guide for the pitman.

3. In a mower, the combination with the frame, shoe and cutter-bar; of a gear-case hinged to the shoe, the cutter-bar-operating mechanism including a crank-shaft and a pitman mounted in and movable with the case.

4. In a mower, the combination with the frame, shoe and cutter-bar; of a gear-case hinged to the shoe, and cutter-bar-operating mechanism including a vertical crank-shaft

mounted in and movable with the case, a pitman normally connecting the crank-shaft and cutter-bar, and means for insuring the withdrawal of the pitman from the cutter-bar when the case is swung back.

5. In a mower, the combination with the frame, shoe and cutter-bar; of a hinged gear-case on the shoe, a crank-shaft within the case, means operatively connecting the crank-shaft and cutter-bar in the normal position of the case, and driving mechanism for the crank-shaft, said mechanism including an extensible shaft accommodating the movement of the case.

6. In a mower, the combination with the frame, shoe and cutter-bar; of a hinged gear-case mounted on the shoe, a vertical crank-shaft within the case, a pitman connected to the crank-shaft and disposed to engage the cutter-bar in one position of the case, a short horizontal shaft afforded bearings in the gear-case and geared to the crank-shaft, and driving mechanism including a flexible and extensible shaft connected with the short horizontal shaft in the gear-case.

7. In a mower, the combination with the frame, a shoe and a cutter-bar provided with a vertical pin; of a vertically-movable gear-case mounted on the shoe, a crank-shaft mounted in the case, a pitman engaging said crank-shaft and the pin on the cutter-bar, said pitman being provided with a guide-flange extending in a guide-groove in the case, and means for driving the crank-shaft.

8. In a mower, the combination with the frame, shoe and cutter-bar; of a gear-case mounted on the shoe, a vertical crank-shaft within the case, a pitman connected to the crank-shaft and engaging the cutter-bar, a short, horizontal shaft afforded bearings in the gear-case and geared to the crank-shaft, and driving mechanism including a flexible and extensible shaft connected with the short horizontal shaft in the gear-case.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EMANUEL CHAINEY.

Witnesses:

FRANK. WARING,  
J. E. PARRY.