

No. 772,152.

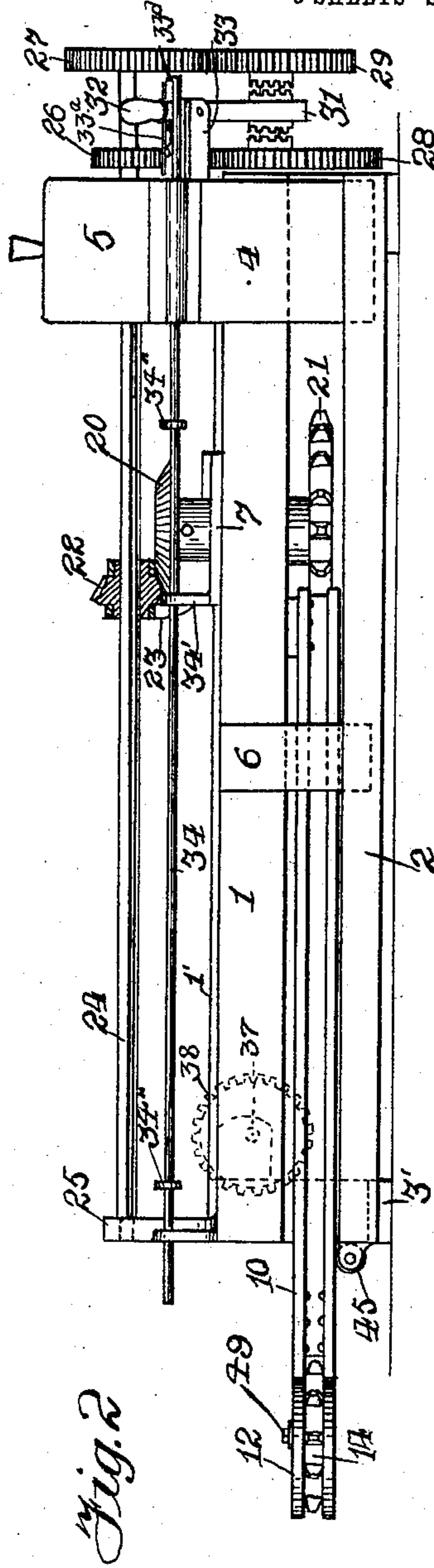
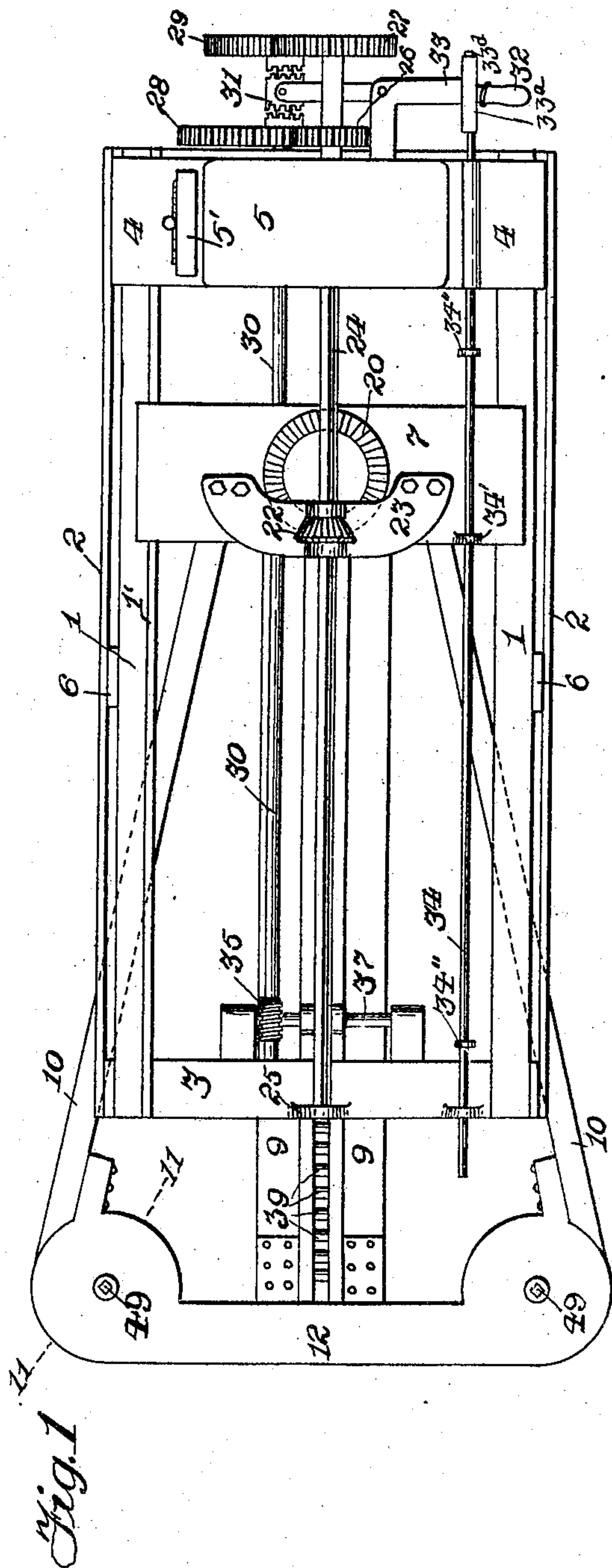
PATENTED OCT. 11, 1904.

J. F. JOY.
COAL MINING MACHINE.

APPLICATION FILED NOV. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
Geo. B. Rowley
L. H. Butten

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J. F. Joy.
By M. C. Everett
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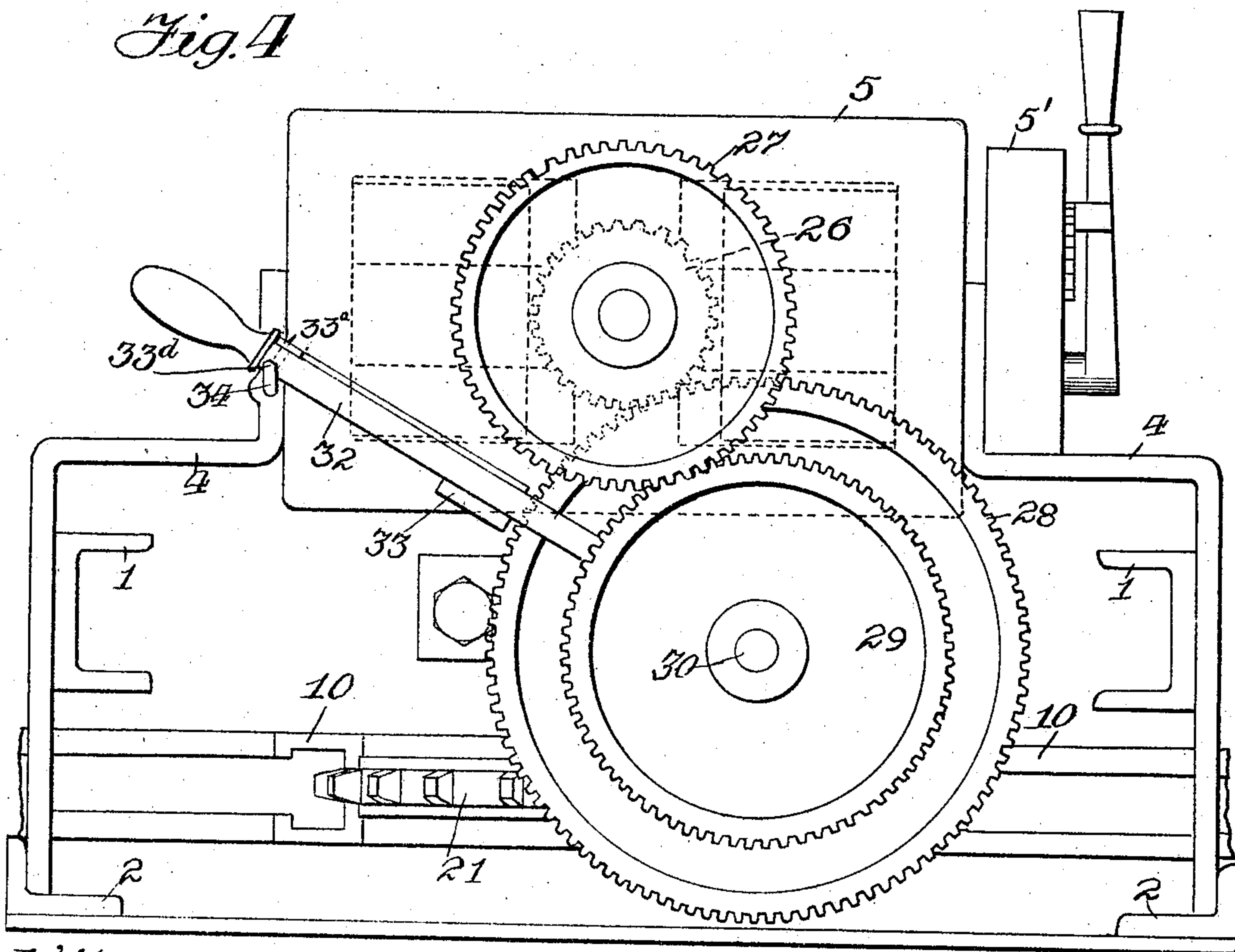
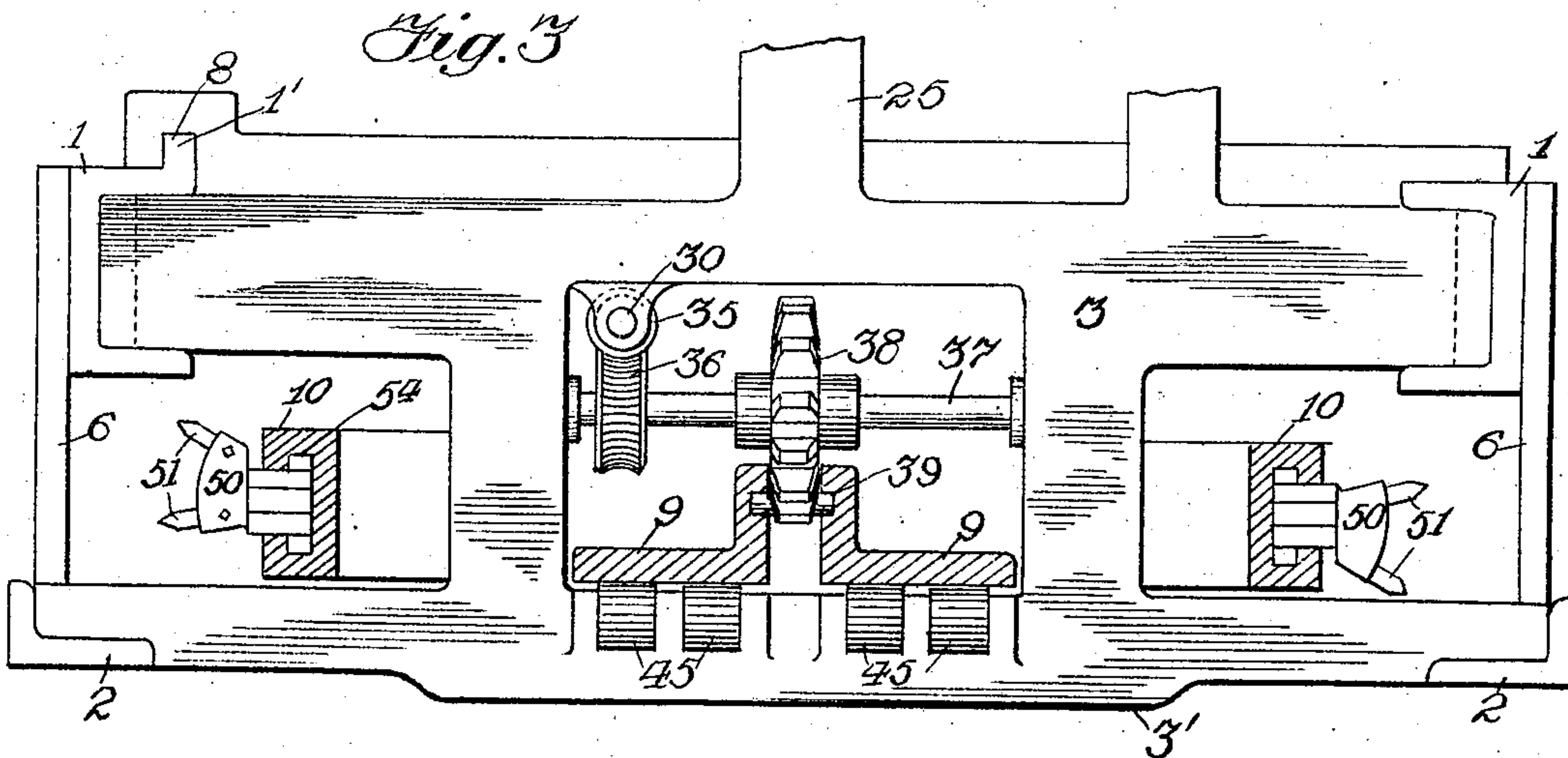
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

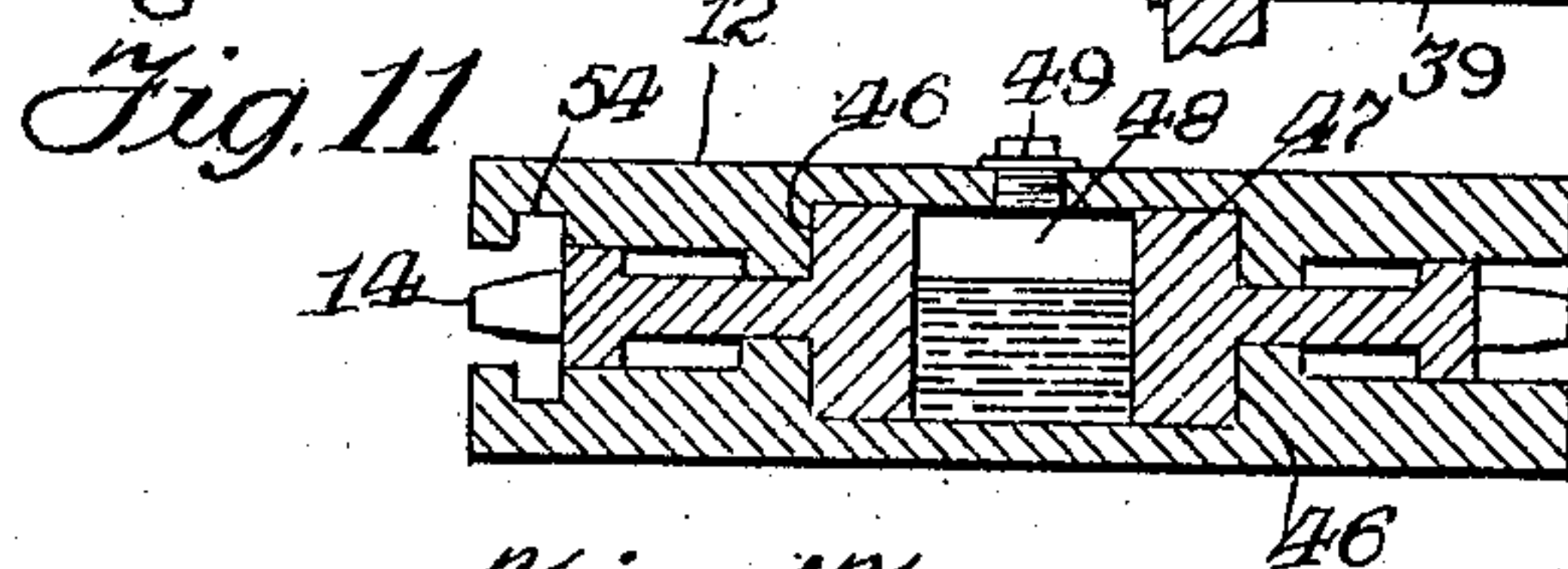
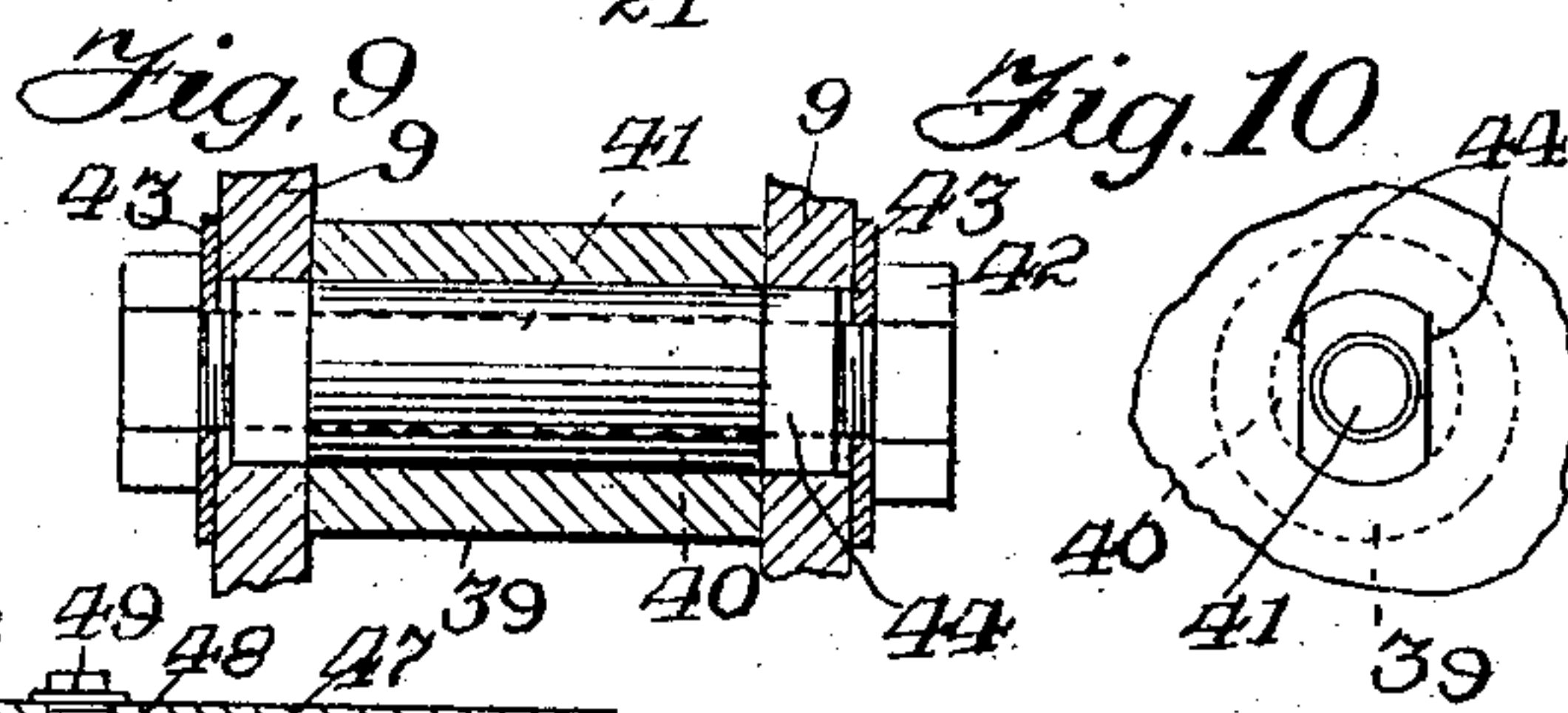
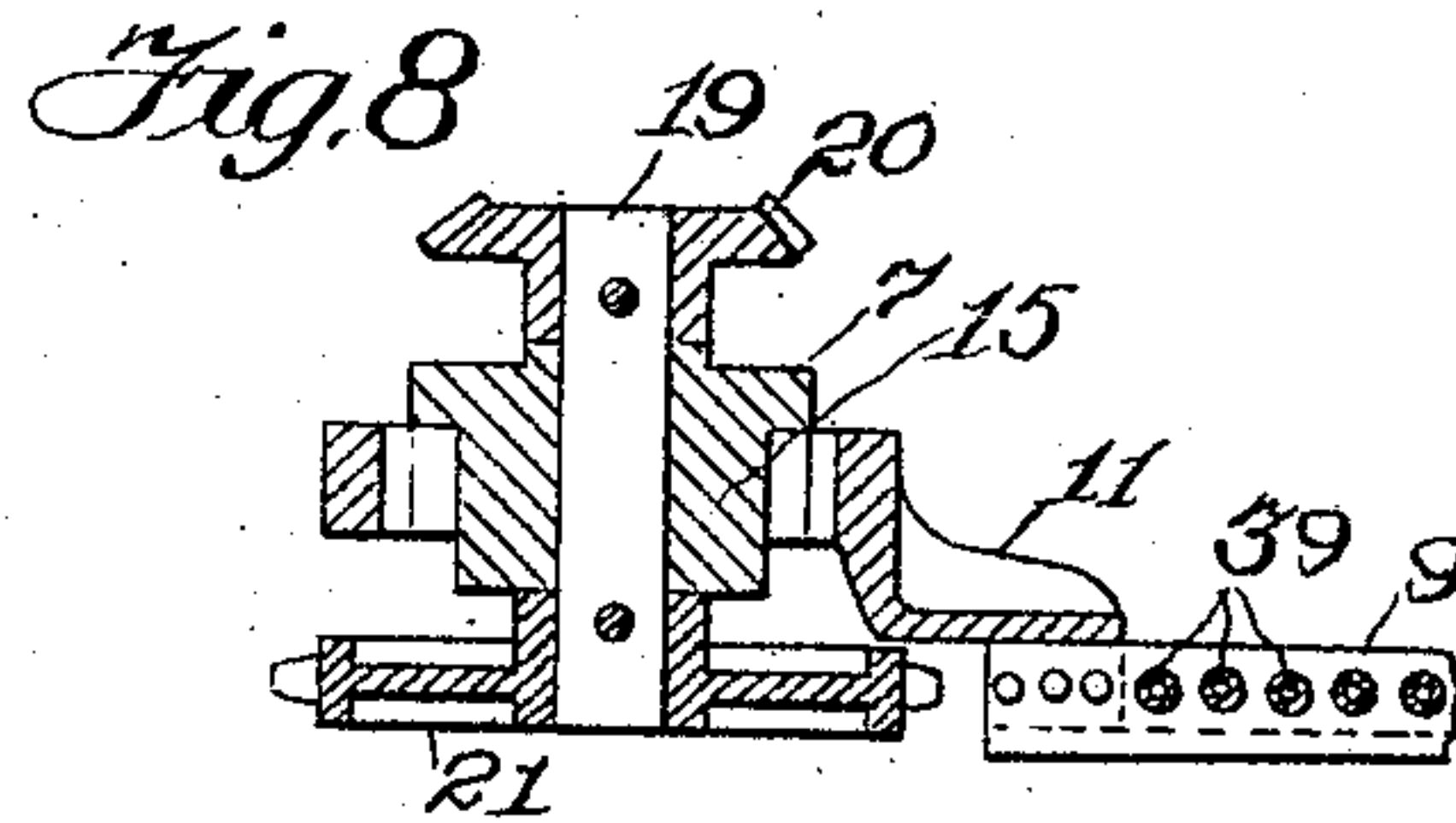
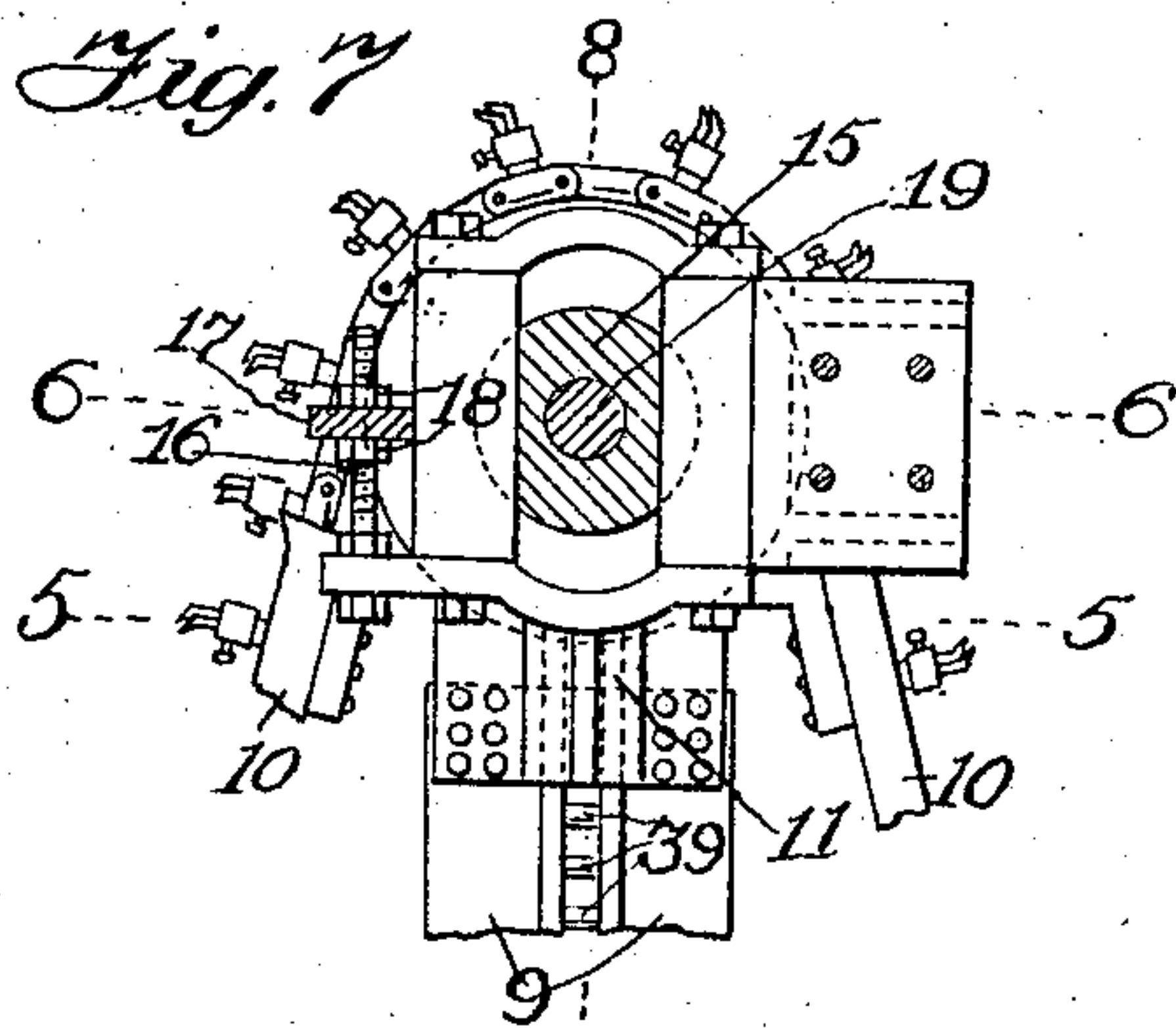
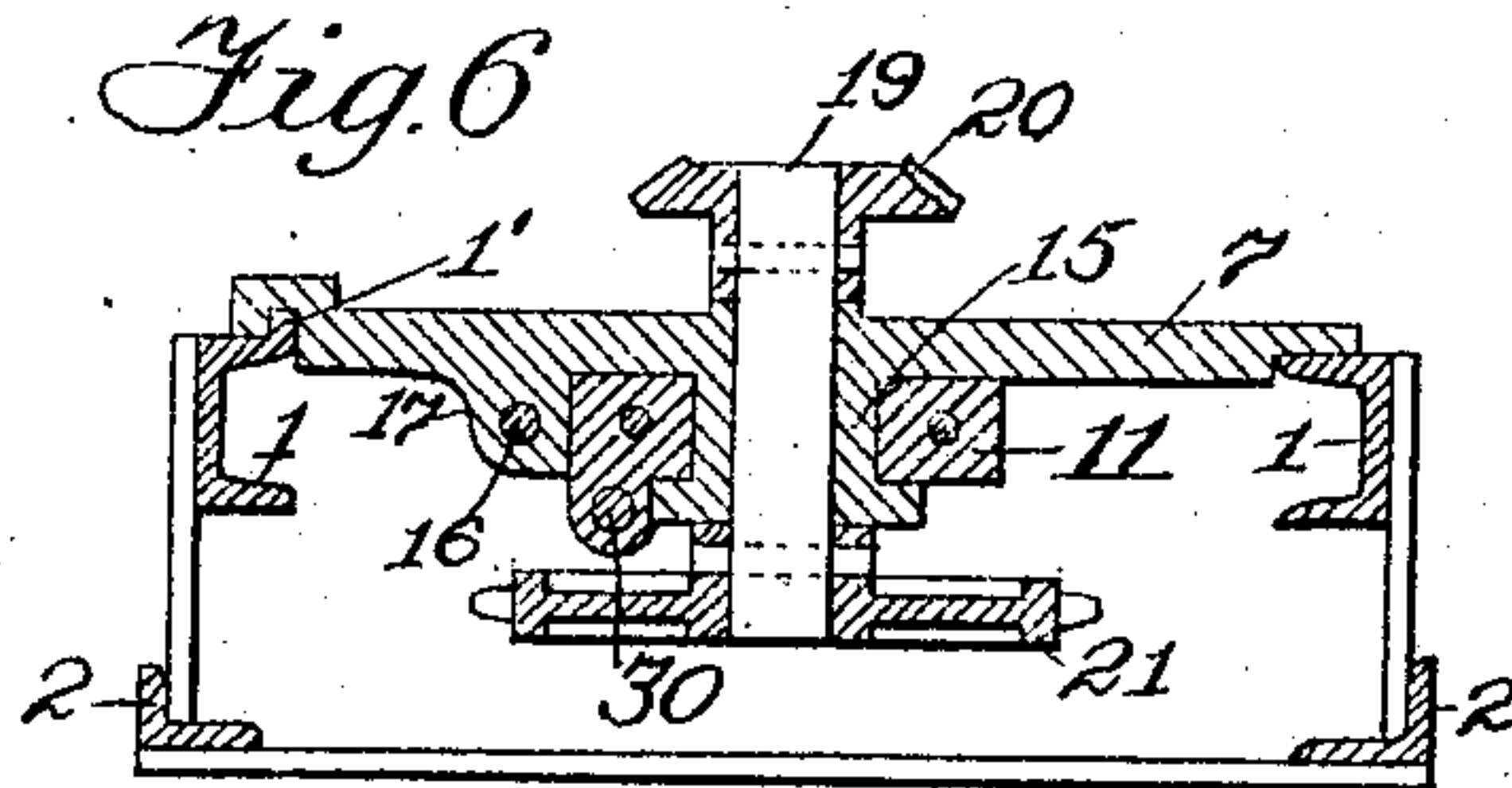
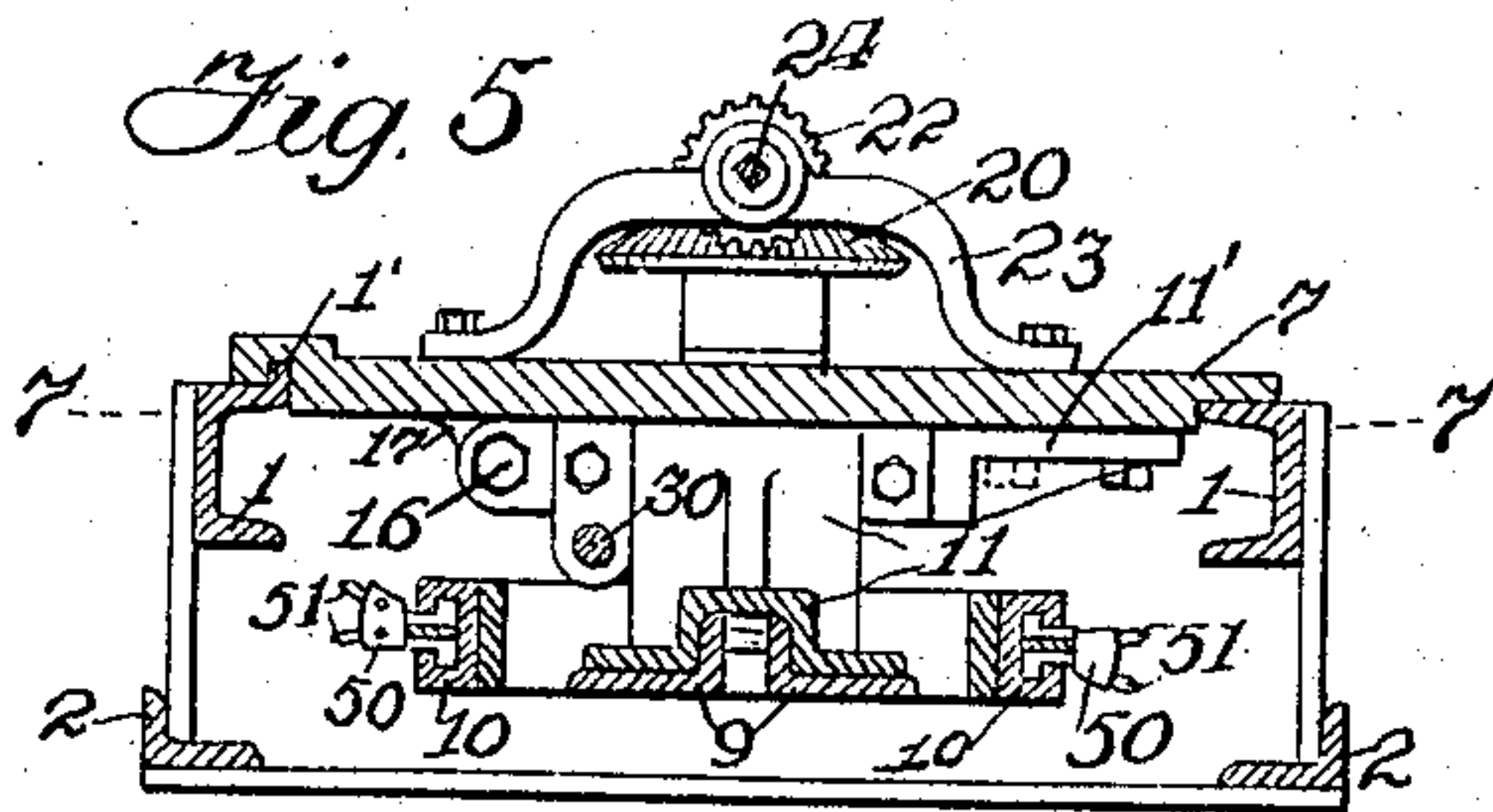


Fig. 12

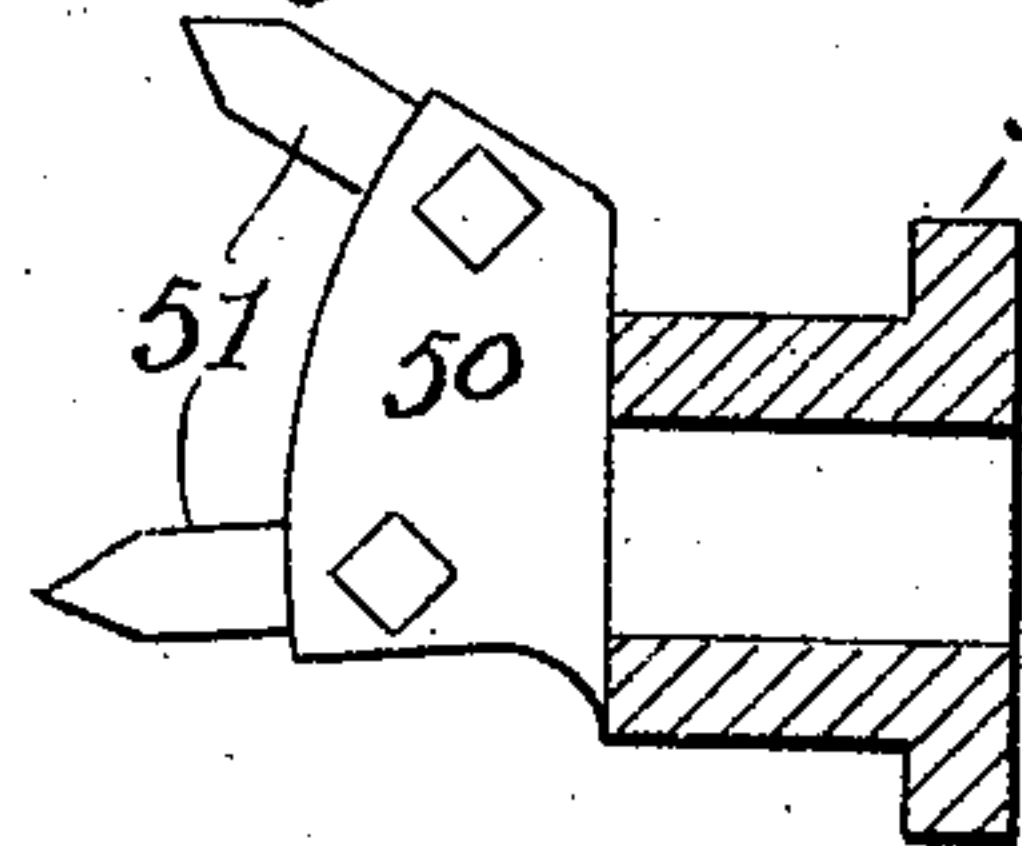


Fig. 13

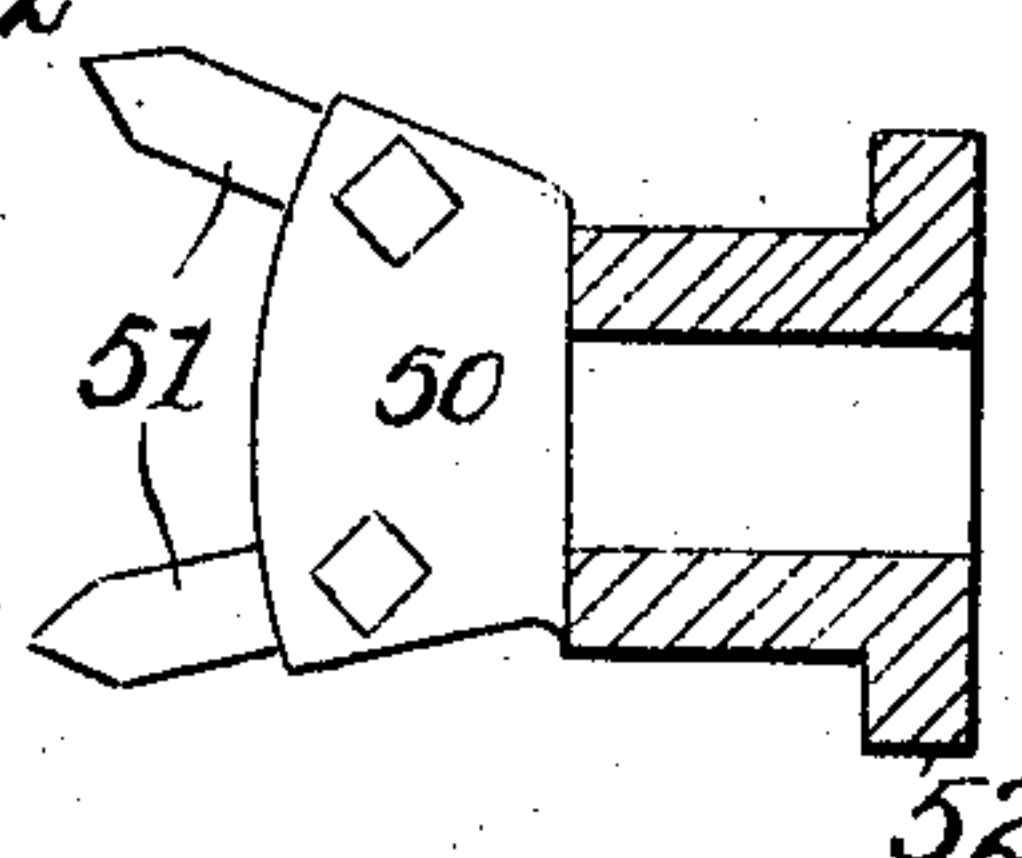


Fig. 14

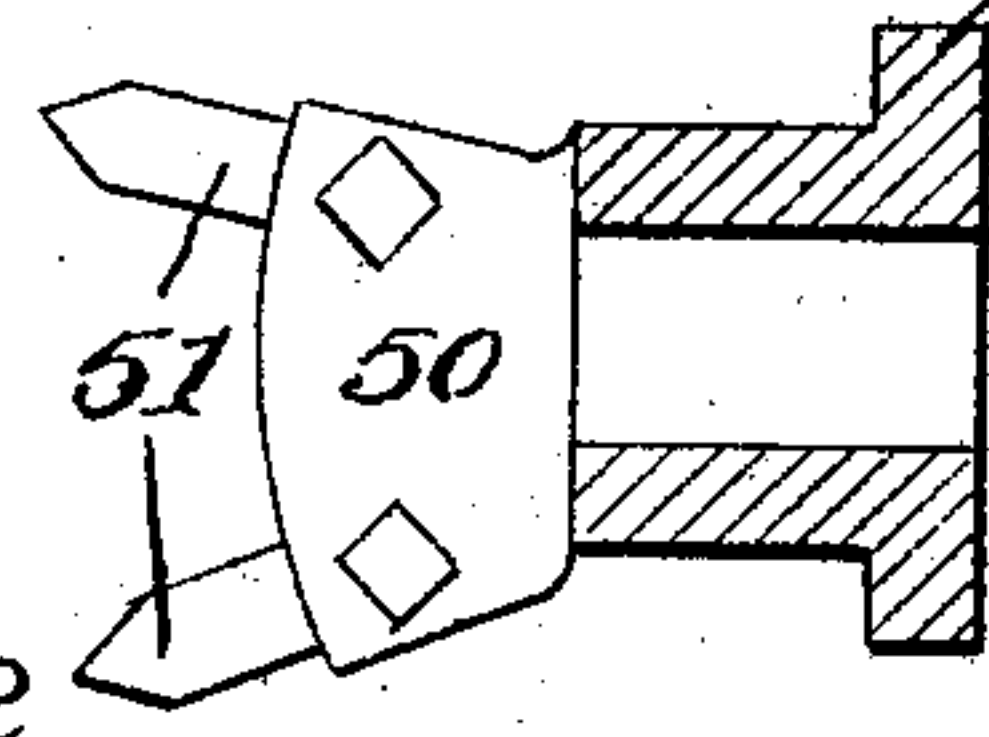


Fig. 15

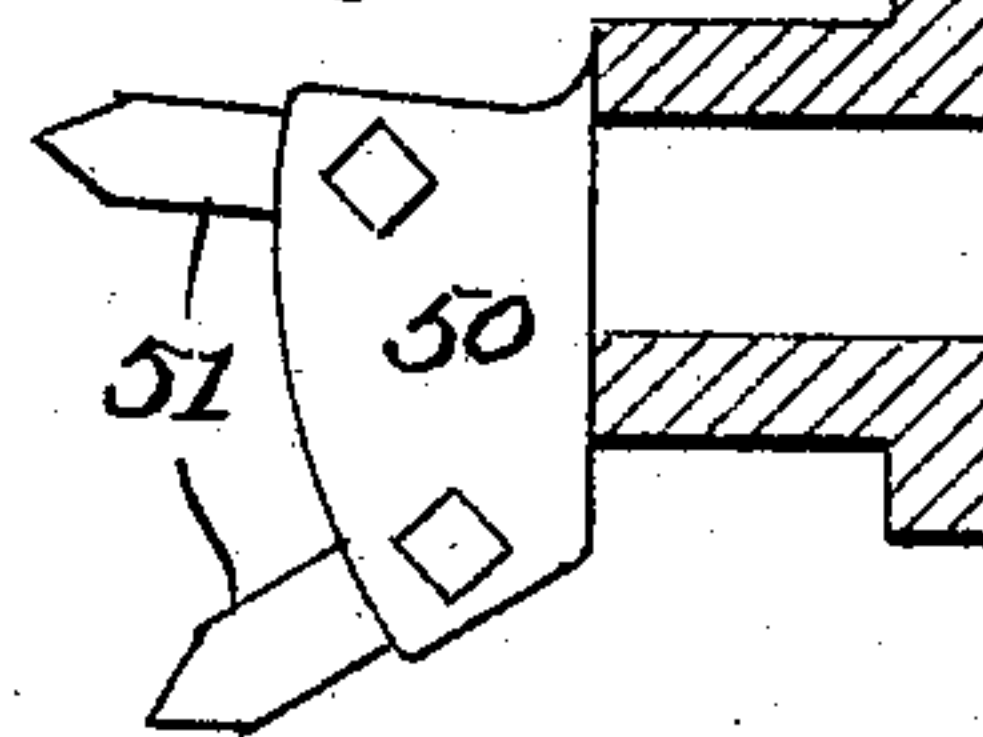


Fig. 16

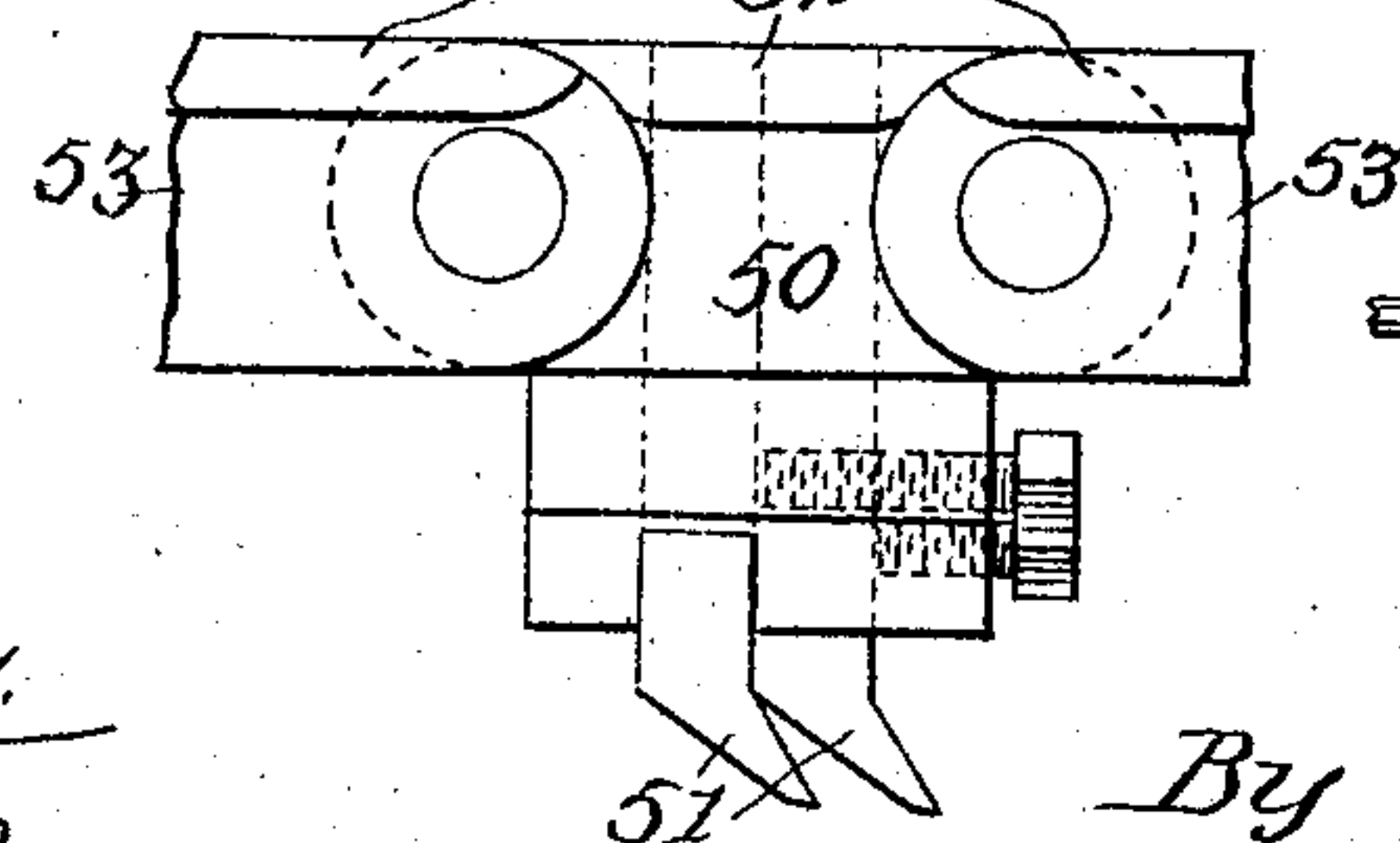
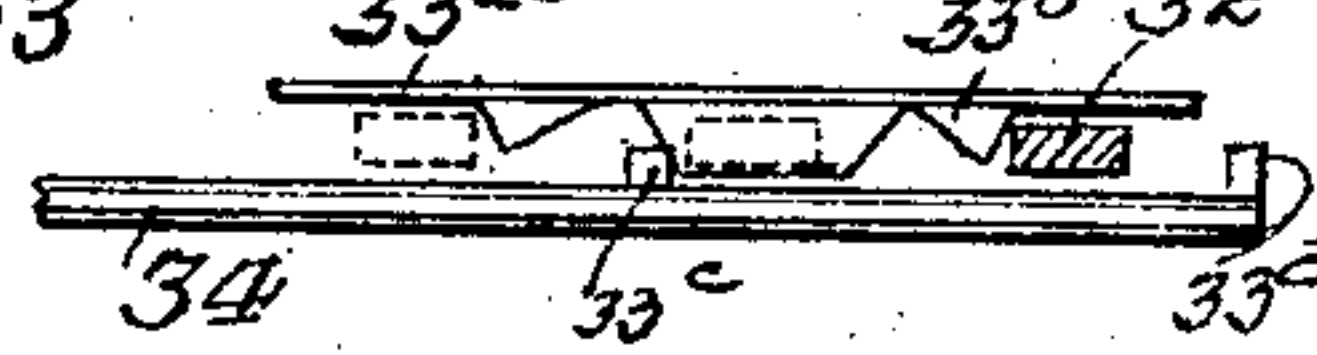


Fig. 17



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UNITED STATES PATENT OFFICE.

JOSEPH F. JOY, OF NEWEAGLE, PENNSYLVANIA

COAL-MINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 772,152, dated October 11, 1904.

Application filed November 14, 1903. Serial No. 181,162. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH F. JOY, a citizen of the United States of America, residing at Neweagle, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Mining Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in mining-machines, and relates more particularly to a machine which is adapted to perform the undercut in the material to be mined.

15 The object of my invention is to provide a machine which may be extremely simple in construction and in which the different parts are so arranged that an extremely compact machine of the least possible length may be obtained, whereby the same may be operated in places which might not be accessible to a machine of greater length.

A further object of this invention is to provide a chain for the machine in which two or more pick-point bits may be secured in a single link, the angular relation of the bits and the links being varied, whereby better results may be obtained than is now possible without the use of the shovel-point type of bits.

30 A still further object of this invention is to so construct the driving mechanism that perfect control of the machine may be possible during all its operations and that the desired movements may be obtained in the several parts.

35 With the above and other objects in view the invention consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claims.

40 In describing the invention in detail reference is had to the accompanying drawings, forming a part of this application, and wherein like numerals of reference indicate like parts throughout the several views, in which—

45 Figure 1 is a plan view of my improved machine, the chain in which the pick-point bits are secured being omitted. Fig. 2 is a side elevation thereof. Fig. 3 is a front elevation, partly in section, of my improved machine.

Fig. 4 is a rear elevation thereof. Fig. 5 is a section on the line 5 5 of Fig. 7. Fig. 6 is a section taken on the line 6 6 of Fig. 7. Fig. 7 is plan view taken on the line 7 7 of Fig. 5. Fig. 8 is a sectional elevation taken on the line 8 8 of Fig. 7. Figs. 9 and 10 are detail views of the feed-rolls. Fig. 11 is a sectional elevation on the line 11 11 of Fig. 1. Figs. 12, 13, 14, and 15 are elevations of the several bit-carrying links of the chain. Fig. 16 is a plan view of Fig. 12. Fig. 17 is a detail view of the clutch-lever-locking mechanism.

Briefly described, my invention consists in providing a frame in which a chain-carrying frame is slidably mounted. Stationarily mounted on the first-mentioned frame is a motor, and a slidable connection between said motor and the driving-sprocket on said chain-holding frame is provided whereby said chain may be positively driven in whatever longitudinal position the said chain-frame may be. I also provide in said chain-frame a plurality of rolls, which are rotatably mounted in said frame and with which a driving-sprocket is adapted to coact, whereby the said frame may be longitudinally moved, this sprocket being suitably geared to the motor and the movement of the same being controlled by a suitable clutch.

Referring to the drawings, the main frame of the machine is composed of two longitudinal channel-beams 1 1 and two longitudinal angle-irons 2 2, the same being connected at their forward ends by the frame 3, on the under side of which a skid 3' is formed, the rear ends of said channels and irons being connected by a part 4, upon which the motor 5 and controller 5' are suitably secured. The channels and angle-irons are also connected intermediate their length by the brackets 6. The motor 5 and frame 4 are located above the angle-irons 2 2 in order that a bracket 7, to which the chain-frame is secured, will extend beneath the said frame when the chain-frame is in its retracted position.

One of the channels 1, preferably the one at the left-hand side looking toward the front of the machine, is provided with a flange 1', and a bracket 7, which is adapted to slide

over the upper face of the channel-bars 1, has its one side provided with a recess 8, which is adapted to coact with the flange 1', whereby the said bracket will be guided during its lateral movement and transverse displacement of said bracket will be prevented.

The chain-carrying frame consists of the two longitudinal angle-irons 9 9 and chain-support guides 10 10, the said angles and guides being secured at their rear ends to a bracket 11, the forward ends of said angles and guides being secured to the member 12, within the ends of which two idler-sprockets 14 14 are journaled. The bracket 11 is slidably mounted upon the extension 15 of the bracket 7 in such a manner that the said bracket 11 may be adjusted longitudinally, this being accomplished through the medium of the rod 16, one end of which is secured to the said bracket 11, the other end being connected to the lug 17, formed on the under side of the bracket 7 by the nuts 18. It will thus be seen that by loosening these nuts and actuating the said rod 16 and again tightening up the nuts the relation of the bracket 11 to the bracket 7 may be changed. A bracket 11' is so positioned under the bracket 7 that any side thrust of the bracket 11 will be prevented.

Journaled in the bracket 7 and the extension 15 thereof is a vertical shaft 19, to the upper end of which the beveled gear 20 is secured, the lower end of said shaft having secured thereto the chain-driving-sprocket 21. Meshing with the gear 20 is a bevel-gear 22, which is mounted in the bracket 23, secured to the upper surface of the bracket 7, and the interior of the gear 22 is formed as a square, and passing therethrough is a squared shaft 24, which is connected directly with or formed on the driving-shaft of the motor 5. The forward end of the shaft is suitably pivoted in a lug 25, formed on the frame 3. It will thus be seen that the travel of the chain-carrying frame and its connecting parts will cause the gear 22 to traverse the shaft 24, and in whatever position the said chain-frame may be the sprocket 21 will be positively driven through the medium of gears 20 22 and squared shaft 24.

Connected on the motor drive-shaft at its rear end are the gears 26 27, which mesh with gears 28 29, loosely mounted on the shaft 30, which is suitably mounted in the frame of the machine, and a friction-clutch 31, mounted on said shaft 30, is adapted to connect one or the other of the gears 28 29 of the shaft 30, and should one or the other of these gears be connected with the shaft 30 and the motor be operating it will be seen that the said shaft 30 will be positively rotated. The friction-clutch 31 is actuated by a lever 32, pivoted in the bracket 33, and an actuating-rod 34, slidably mounted in the frame of the machine, is adapted to be actuated by a lug 34', carried by the chain-frame and adapted to engage with the

stops 34'' 34'' on rod 34, whereby the said clutch will be disengaged from the gears 28 29 when the chain-frame is in its extreme extended or retracted position. The bracket 33 has a T-shaped outer end 33^a, provided with lugs 33^b on its underneath face to hold the lever 32 in the position in which it has been placed. As the lever is moved the T-shaped end springs up sufficiently to allow the movement of the lever. The lever is engaged and moved by the rod 34 through the medium of lugs 33^c 33^d on said rod.

Secured on the forward end of the shaft 30 is a worm 35, said worm meshing with a worm-gear 36, mounted on a shaft 37, journaled in the frame 3. Secured on this shaft 37 is a driving-sprocket 38, and rotatably mounted between the longitudinal angles 9 of the chain-frame are rollers 39, on which the said sprocket 38 is adapted to act, whereby the said chain-frame may be positively moved either forward or backward. The construction and method of mounting these rollers is clearly indicated in Figs. 9, 10, the said rollers 39 being mounted on a bushing 40, through the interior of which a securing-bolt 41 passes, said bolt being held in place by the nut 42, and washers 43 43 are placed in position, as shown. The rotation of the bushing 40 is prevented by its flattened ends 44 engaging in apertures correspondingly formed in angles 9 9 to receive said ends, and by this construction greater strength is obtained than would be possible were the rollers mounted directly on the bolt.

Mounted in the frame 3 beneath the angles 9 9 are supporting-rollers 45. It will be readily seen that by this means the frame will be supported at its forward end.

The construction of the idler-sprockets 14 and the part 12 is such that a perfect lubrication of said sprockets may always be obtained, and to this end I provide in the inner portion of the part 12 the circular cut-away openings 46, and in these openings the hub 47 of the sprockets 14 is adapted to have a bearing, the interior of the said hub 47 being provided with an opening 48, in which a quantity of lubricant may be placed by removing caps 49, and by this means the said sprockets will be more readily lubricated.

As it is desirable to use a pick-point bit instead of a shovel-point bit, I provide a chain whereby the said pick-point bits may be efficiently used, this chain being provided with a plurality of bit-holding links 50, in each of which two or more points 51 may be set, the succeeding bit-holding links being differently angularly disposed, whereby the entire surface to be cut away by the bits may be reached by the said bits. This construction and arrangement will be clearly understood by referring to Figs. 12 to 16, inclusive, and it will be also noted that the extensions 52, provided on the links 50 and also on the links 53, are adapted to operate in the ways 54, provided

in the chain-support guides 10 and the part 12, whereby the chain is at all times properly guided and supported.

The operation of my improved device is as follows: The motor 5 being caused to rotate in the desired direction by the controller 5', the chain will be positively driven through the medium of the shaft 24, gears 22 20, shaft 19, and chain-driving sprocket 21, and to feed the chain-frame forward the clutch-lever 32 is actuated, whereby the gear 28, which is driven by the gear 26, mounted on the motor-shaft, will be positively connected to the shaft 30, and thus rotate the worm 35, whereby the worm-gear 36, mounted on the shaft 37, is rotated, thus rotating the sprocket 38, which acts on the rollers 39, mounted in the angles 9 of the chain-frame, thus causing the same to move forward at a predetermined speed. As it is desirable that the frame should be withdrawn more rapidly than it has been advanced, the proportions of the gears are such that when the clutch-lever 32 is actuated whereby to disconnect the gear 28 from the shaft 30 and connect the gear 29 with the said shaft, the gear 27 being of considerable greater diameter than the gear 26, the said gear meshing with the gear 29, which is of considerable smaller diameter than the gear 28, the said shaft 30 will be much more rapidly rotated, and the motor having been reversed the chain-frame will be rapidly withdrawn.

While I have herein shown and described my invention in detail, it will be noted that various changes may be made in the details of construction, arrangement of parts, and method of gearing without departing from the general spirit of the invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a mining-machine, a stationary frame comprising channel-beams and angle-irons arranged therebelow, end frames connected to said beams and irons, a frame slidingly mounted on said stationary frame composed in part of centrally-arranged angle-irons, the bases of which slidingly engage said end frame and the webs of which form supports for the means whereby the same may be driven.

2. In a mining-machine, a stationary frame

having an aperture in one of its ends, a slidable frame on said stationary frame and composed in part of centrally-arranged angle-irons received in said aperture and supported from said frame end, and operating means carried by the stationary frame and extending between said angle-irons for actuating the slidable frame.

3. In a mining-machine, a stationary frame, having an aperture in one of its ends, a sliding frame having a bracket mounted on the stationary frame and composed in part of a pair of centrally-arranged angle-irons extending through said frame end aperture and rollers mounted on the frame end and engaging the bases of said irons, and means operating between the webs of said irons to operate the sliding frame.

4. In a mining-machine, a stationary frame, a movable frame thereon, said movable frame carrying a pair of centrally-arranged spaced angle-irons with rollers mounted between said irons, the bases of said irons forming a means of support for the forward end of the movable frame, and driving means on the stationary frame to engage said rollers and actuate said movable frame.

5. In a mining-machine, a stationary frame and a movable frame having spaced angle-irons, a driving means on said stationary frame and means operated by said driving means and located on said movable frame between said angle-irons to enable actuation of said movable frame, the bases of said irons supporting the movable frame at its forward end.

6. In a mining-machine, a stationary and a movable frame, the movable frame composed in part of spaced angle-irons, the bases of which receive support from the stationary frame, a driving means on the stationary frame operating in said space of the irons and means mounted between said irons on the movable frame to engage said driving means to actuate the movable frame.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH F. JOY.

Witnesses:

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E. E. POTTER.