

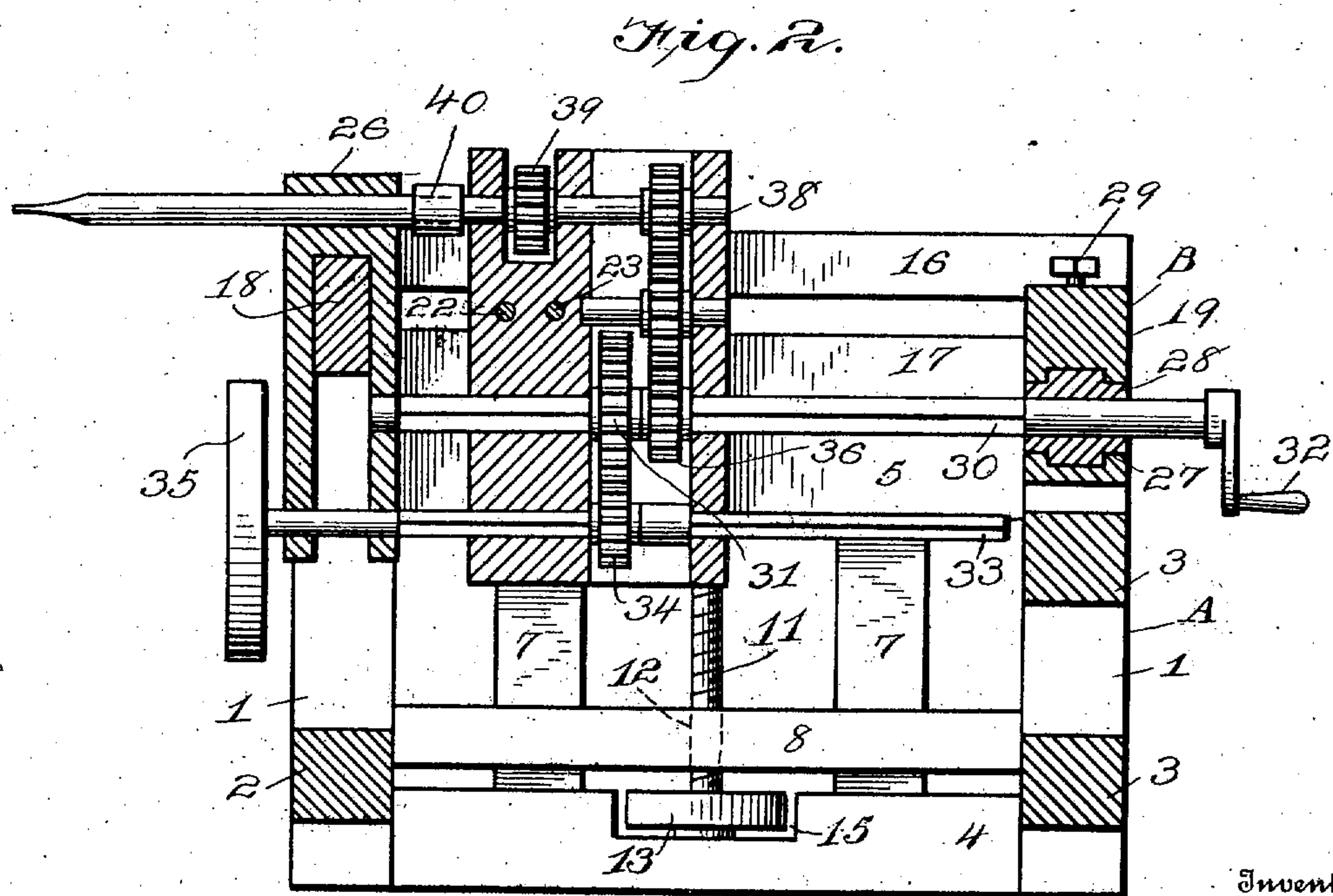
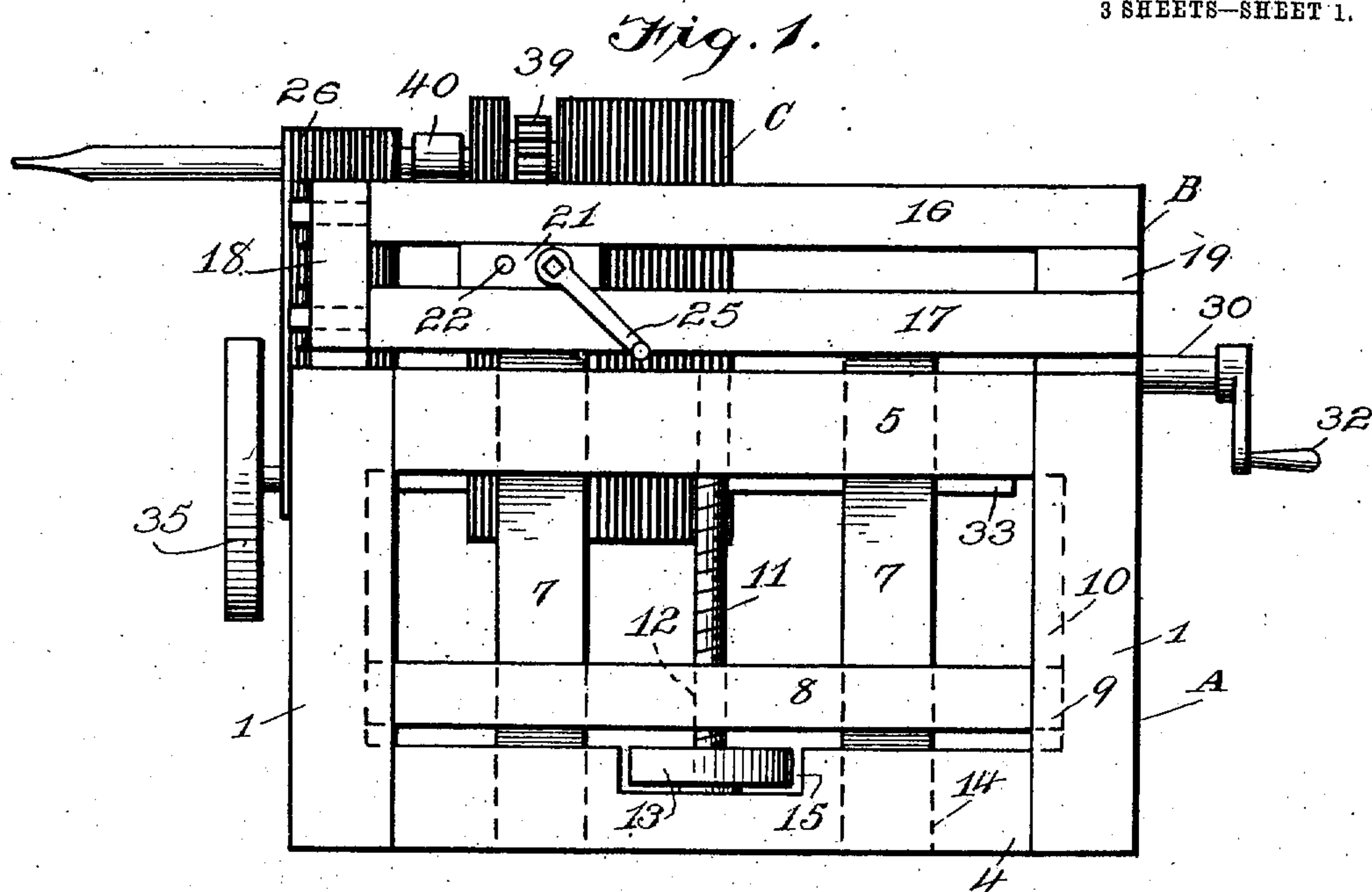
No. 850,192.

PATENTED APR. 16, 1907.

E. G. TILLMAN.
MINING MACHINE.

APPLICATION FILED JULY 17, 1906.

3 SHEETS—SHEET 1.



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Fig. 3.

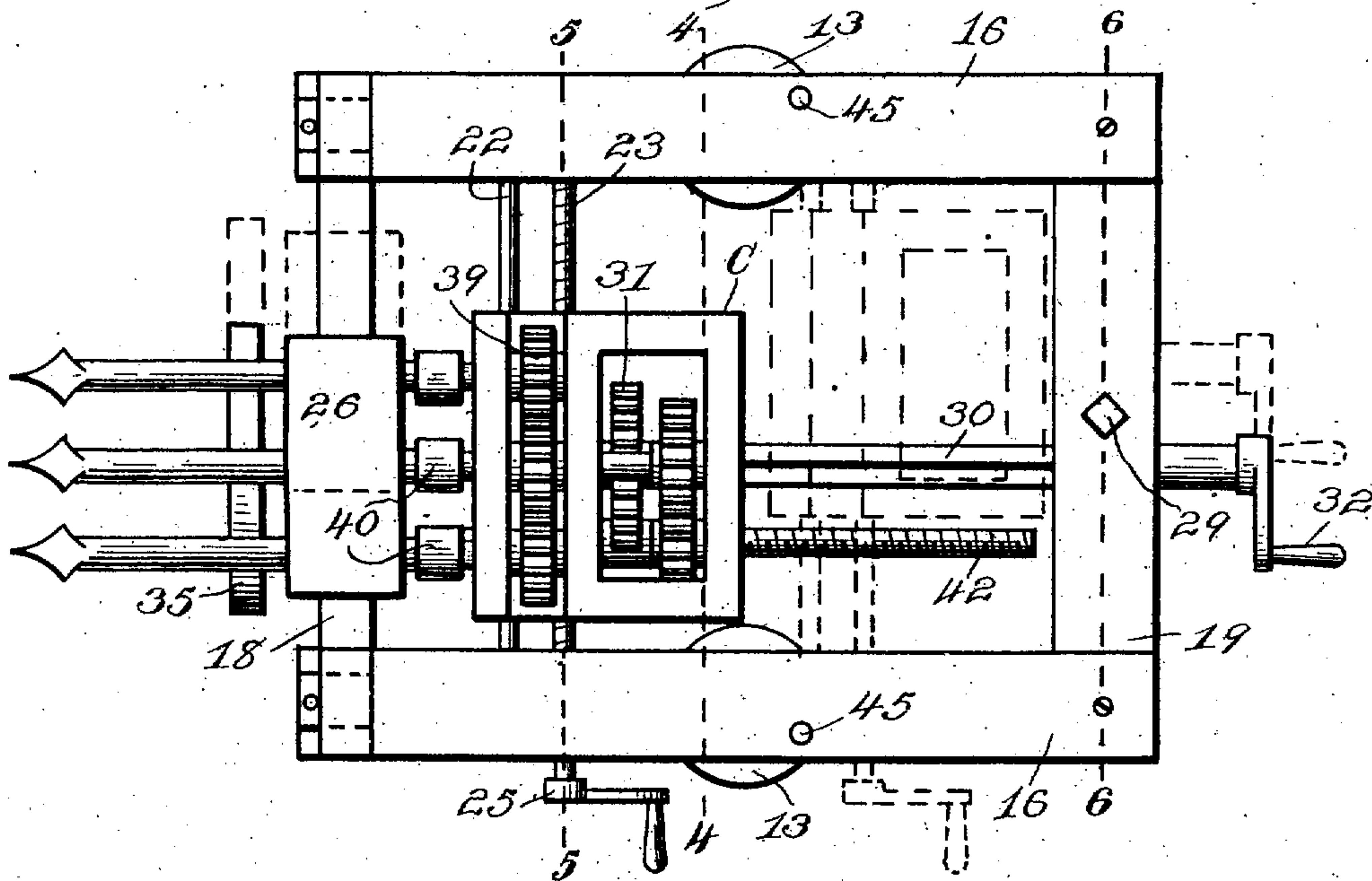
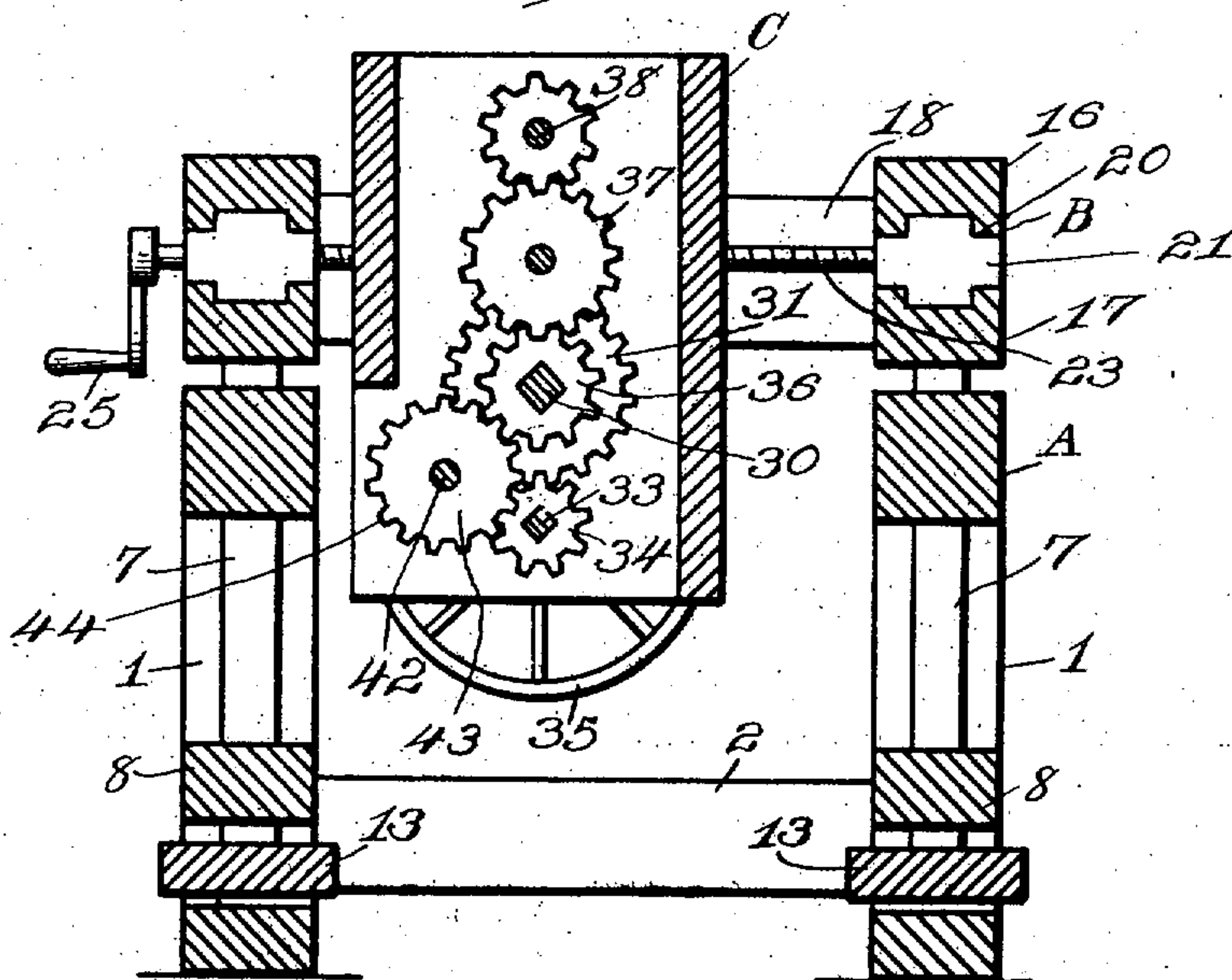


Fig. 4.



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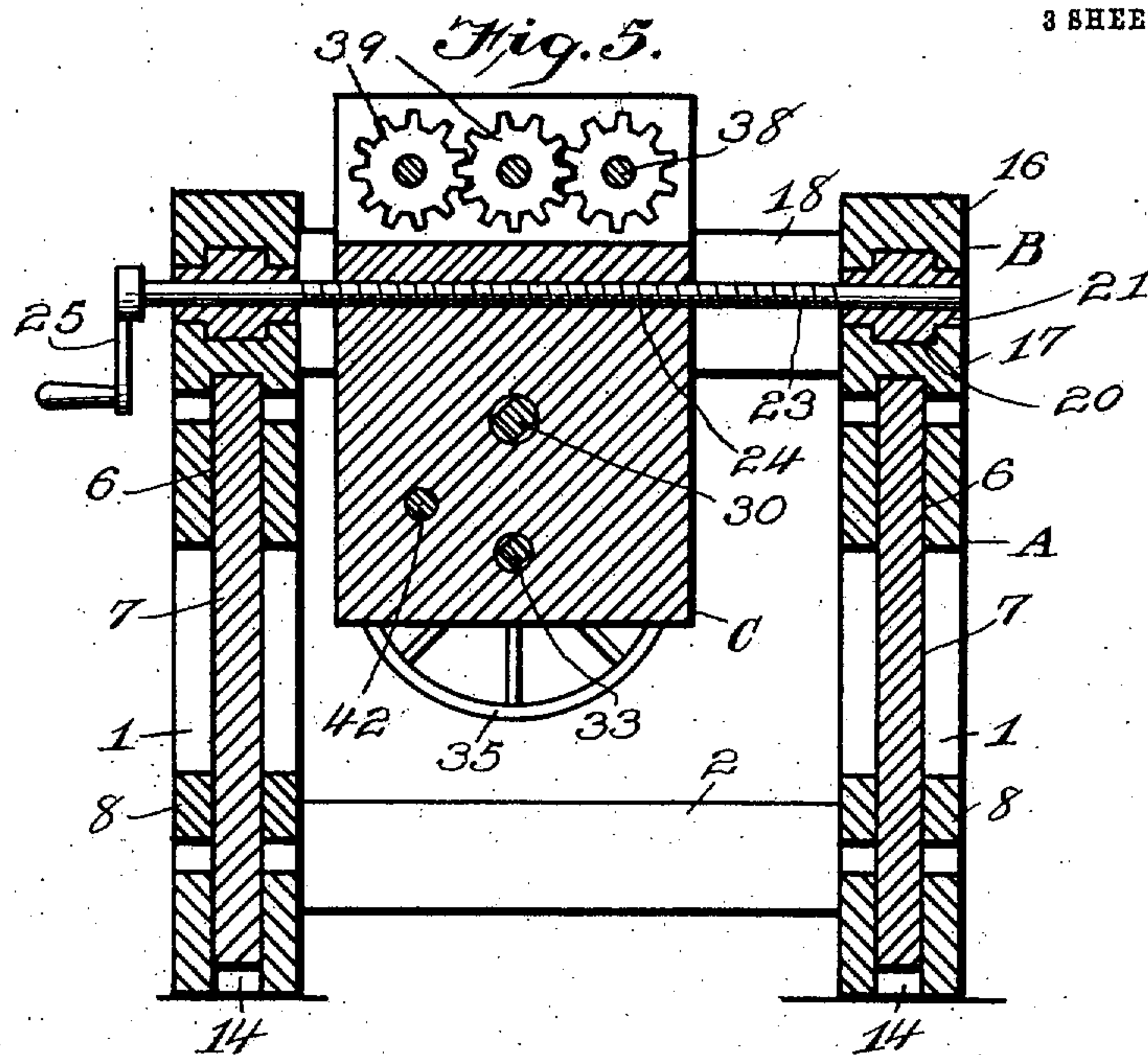
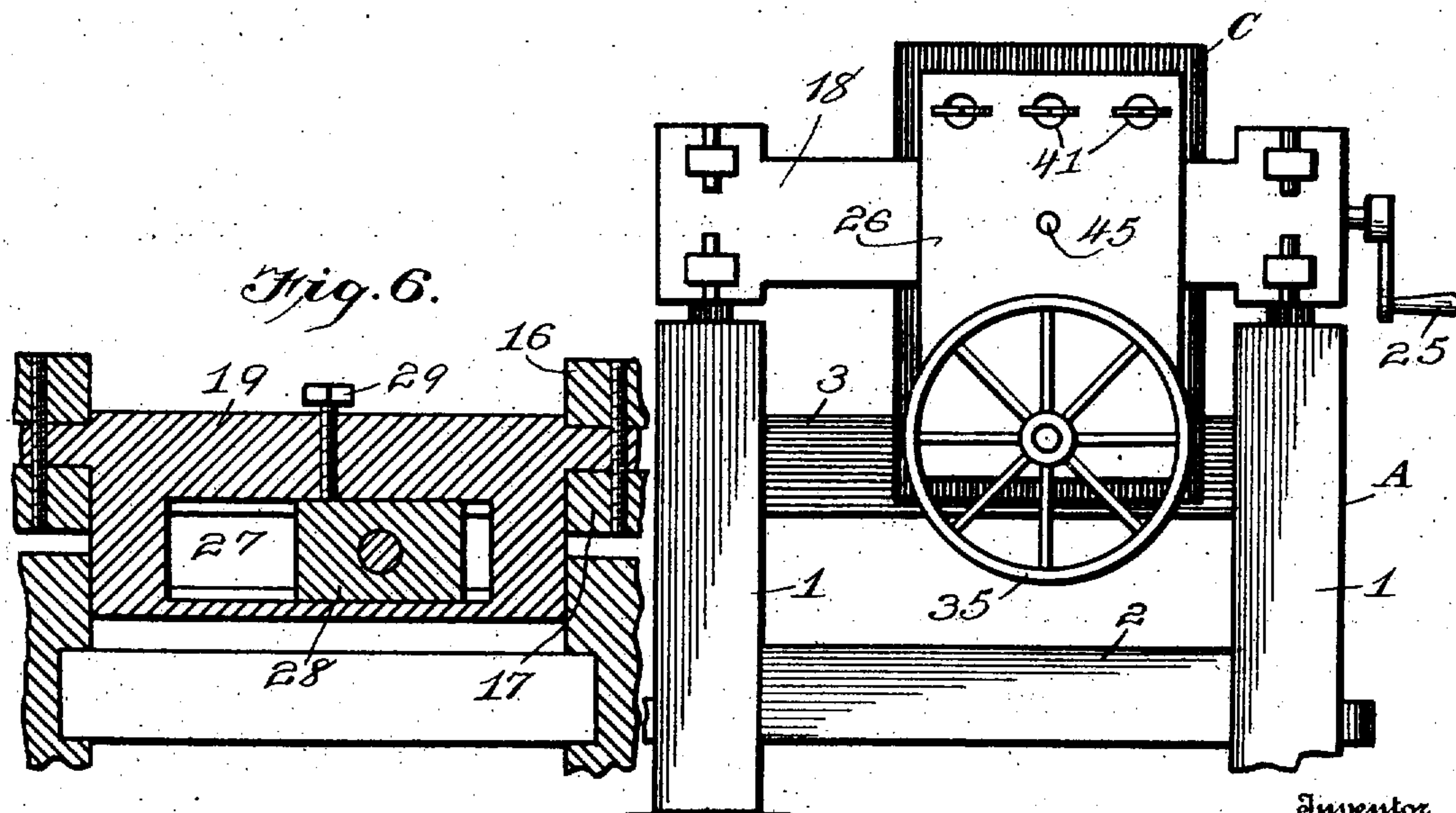


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD G. TILLMAN, OF THAYER, WEST VIRGINIA.

MINING-MACHINE.

No. 850,192.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed July 17, 1906. Serial No. 326,626.

To all whom it may concern:

Be it known that I, EDWARD G. TILLMAN, a citizen of the United States, residing at Thayer, in the county of Fayette and State of West Virginia, have invented a new and useful Mining-Machine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of coal-mining machines which are adapted to be operated by hand in localities where power is not available and which comprise a plurality of bits or drills adapted to cut into the coal or mineral that is being operated upon.

The principal object of the present invention is to provide an improved construction for facilitating the adjustment laterally or transversely, as well as vertically, of the cutter-head carrying the operating-bits. Further objects are to simplify and improve the general construction and arrangement of the parts of the machine.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations, and modifications within the scope of the invention may be resorted to when desired.

In the drawings, Figure 1 is a side elevation of a mining-machine constructed in accordance with the principles of the invention. Fig. 2 is a longitudinal vertical sectional view of the same. Fig. 3 is a top plan view showing in full and in broken lines, respectively, two different adjustments of the bit-carrying head or cutter-head. Fig. 4 is a transverse sectional view taken on the plane indicated by the line 4 4 in Fig. 3. Fig. 5 is a transverse sectional view taken on the plane indicated by the line 5 5 in Fig. 3. Fig. 6 is a transverse sectional view taken on the plane indicated by the line 6 6 in Fig. 3. Fig. 7 is a front elevation.

Corresponding parts in the several figures are denoted by like characters of reference.

In the construction of the improved mining-machine a substantially rectangular main frame A is provided, said frame being of any suitable and desired dimensions and constructed in a massive manner, so as to be able to resist any strain to which it is liable to be subjected. In the preferred form illustrated in the drawings said frame includes the corner members, forming legs or uprights 1 1, which are connected by front and rear cross-bars 2 3 and by longitudinal members or side bars 4 and 5 near the bottom and top, respectively.

The side bars 5 5 at the top of the main frame are provided with mortises 6 for the passage of vertical guide-bars 7, connected with and carrying a vertically-adjustable frame B, which is supported above the main frame A. The guide-bars or carrying-bars 7 at each side of the frame are connected by longitudinal bars 8, extending between the front and rear posts or uprights 1 1 and having terminal tongues 9, guided in grooves 10 in said uprights. Adjusting-screws or threaded shafts 11 are journaled in the longitudinal bars 4 5 at the sides of the frame, said screws or threaded shafts extending through threaded apertures 12 in the connecting-bars 8; said adjusting-screws being provided with hand-wheels 13, whereby they may be conveniently manipulated to effect the vertical adjustment of the frame B and related parts, as will be readily understood. The bottom side bars have sockets 14 to accommodate the lower extremities of the guide-bars 7 when the frame B is in a lowered position. Sockets or recesses 15 for the accommodation of the hand-wheels 13 are also formed in the bottom side bars 4 of the frame A, thus insuring compactness and solidity of the parts.

The vertically-adjustable frame B is composed of pairs of spaced side members 16 and 17, the latter of which, being the lower ones, are provided with the downward-extending guide-bars 7 7, hereinbefore described. The pairs of side bars 16 17 are framed together or connected at their front ends by a plate 18 and at their rear ends by a plate or block 19. The opposing faces of the side bars 16 17 are provided with grooves 20 for the accommodation of longitudinally-sliding blocks 21, that serve to support the transversely-adjustable cutter-head, as will be presently more fully described.

The cutter-head C consists of a suitably-constructed casing having laterally-extending arms 22, which are guided slidingly in the

blocks 21. The latter are also provided with bearings for the terminal ends of a threaded shaft 23, which extends through a correspondingly-threaded perforation 24 in the casing of the cutter-head, which latter may thus be transversely adjusted in the frame by simply manipulating the threaded shaft or adjusting-screw 23, the latter being provided with a crank or handle 25, whereby it may be conveniently manipulated.

The plate 18 at the front end of the frame B supports a transversely-slidable stirrup-plate 26, and the plate 19 at the rear end of the frame B has a slot 27, wherein is guided a transversely-slidable block 28, said block being capable of being retained in position at various adjustments, as by means of a set-screw 29.

A main operating-shaft 30 extends longitudinally through the casing of the cutter-head, said shaft being preferably of non-circular cross-section through the greater portion of its length in order that it may slide through a driving-wheel, such as a spur-gear 31, fitted thereupon for rotation therewith within the casing of the cutter-head. The ends of the operating-shaft 30 are journaled in the stirrup-plate 26 and in the block 28, and the rear end of said shaft has a crank 32, whereby it may be manipulated. An additional shaft 33 of non-circular contour in cross-section is journaled at its front end in the stirrup-plate 26 and extends rearward through the casing of the cutter-head, where it is provided with a sliding pinion 34, meshing with the spur-gear 31, whereby the shaft 33 will thus be driven, said shaft carrying at its front end a fly-wheel 35. The main operating-shaft 30, in addition to the spur-gear 31, carries a driving-pinion 36, serving to transmit motion through gearing 37 to one of a plurality of shafts 38, journaled in the upper portion of the casing of the cutter-head and provided with intermeshing pinions 39, whereby they will be operated simultaneously or in series, as will be readily understood. The front ends of the shafts 38 have sockets 40 for the reception of the bits, which latter are guided through apertures 41 in the stirrup-plate at the front end of the machine.

Suitably secured in the stirrup-plate 26 and extending rearward through the casing of the cutter-head is a feed-screw 42, upon which within the casing of the cutter-head there is mounted a nut 43, having peripheral teeth 44 meshing with the driving-pinion 36. It will thus be seen that when the shaft 30, carrying the pinion 36, is rotated the cutter-head casing will be fed in a forward or a rearward direction, according to the direction of rotation, and that at the same time the bit-carrying shafts will be effectively rotated. At the same time motion will be transmitted to the fly-wheel-carrying shaft, whereby the op-

eration of the machine will be steadied and otherwise facilitated and improved.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains. The general construction is simple, compact, and inexpensive, and it provides simple mechanical means for boring in coal in localities where power is not available. By simply manipulating the screws 11 the frame B, in which the cutter-head moves, may be vertically adjusted, and transverse adjustment of the cutter-head in said frame may be effected by manipulation of the feed-screw 23, thus enabling the bits or cutters to be readily adjusted to any desired position for operation. By rotating the main operating-shaft the bit-carrying shafts are rotated, and the cutter-head is at the same time fed forward or rearward, as may be desired, according to the direction of rotation.

For the purpose of securing the machine in position during operation brace-screws of ordinary construction are to be employed, and recesses or sockets 45 for the reception of the points of such screws have been shown in the frame-beams 16 and in the stirrup-plate 26.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a mining-machine, a main frame comprising corner-posts provided with vertical grooves and upper and lower side members, the upper side members being provided with vertical mortises; a vertically-adjustable frame having bars guided through the mortises and bars connecting the guiding-bars and having threaded perforations and terminal tongues guided in the grooves in the corner-posts; adjusting-screws extending through the threaded perforations in the connecting-bars and journaled in the upper and lower side members of the main frame; and a cutter-carrying head longitudinally and transversely movable in the vertically-adjustable frame.

2. In a mining-machine, a main frame, comprising upper and lower side members the former being provided with mortises, and the latter being provided with recesses and corner-posts being provided with grooves; a vertically-adjustable frame comprising guide-bars and bars connecting the guide-bars and provided with threaded perforations and terminal tongues, the guide-bars operating through the mortises in the main frame and having their terminals adapted to enter the recesses in the lower side bars of the main frame and the terminal tongues being adapted to move in the grooves in the corner-posts; and adjusting-screws extending

through the perforations in the connecting-bars, journaled in the upper and lower side members and having hand-wheels arranged in the recesses in the lower side members.

5 3. In a mining-machine, a vertically-adjustable frame, formed with spaced side members and a slot at its rear end, a stirrup-plate transversely movable upon the front end of
10 said frame, a block transversely movable in the slot in the rear end of said frame, blocks supported for longitudinal movement between the spaced side members, a cutter-carrying head supported for transverse movement
15 in the longitudinally-movable blocks, bit-carrying shafts supported for rotation in the cutter-carrying head, an operating-shaft extending through the latter and journaled in the stirrup-plate and in the transversely-movable block of the vertically-adjustable
20 frame, driving means slidably connected with the operating-shaft, means for transmitting motion from the latter to the bit-carrying shafts, a feed-screw connected with the stirrup-plate and extending through the
25 cutter-carrying head, and a nut upon said feed-screw having peripheral teeth meshing

with the driving means upon the operating-shaft.

4. In a mining-machine, a vertically-adjustable frame having spaced side members, 30 blocks supported for longitudinal movement between said side members, a cutter-head supported for transverse movement in the longitudinally-movable blocks, bit-carrying shafts supported for rotation in the cutter- 35 head, a fly-wheel-carrying shaft extending through the latter, a suitably-supported feed-screw extending through the cutter-head, a nut located within the cutter-head upon the feed-screw, a suitably-supported operating- 40 shaft extending through the cutter-head, and means for transmitting motion from said shaft to the bit-carrying shafts, to the fly-wheel-carrying shaft, and to the nut upon the feed-screw. 45

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD G. TILLMAN.

Witnesses:

H. L. GOODMAN,
B. J. ANTHONY.