

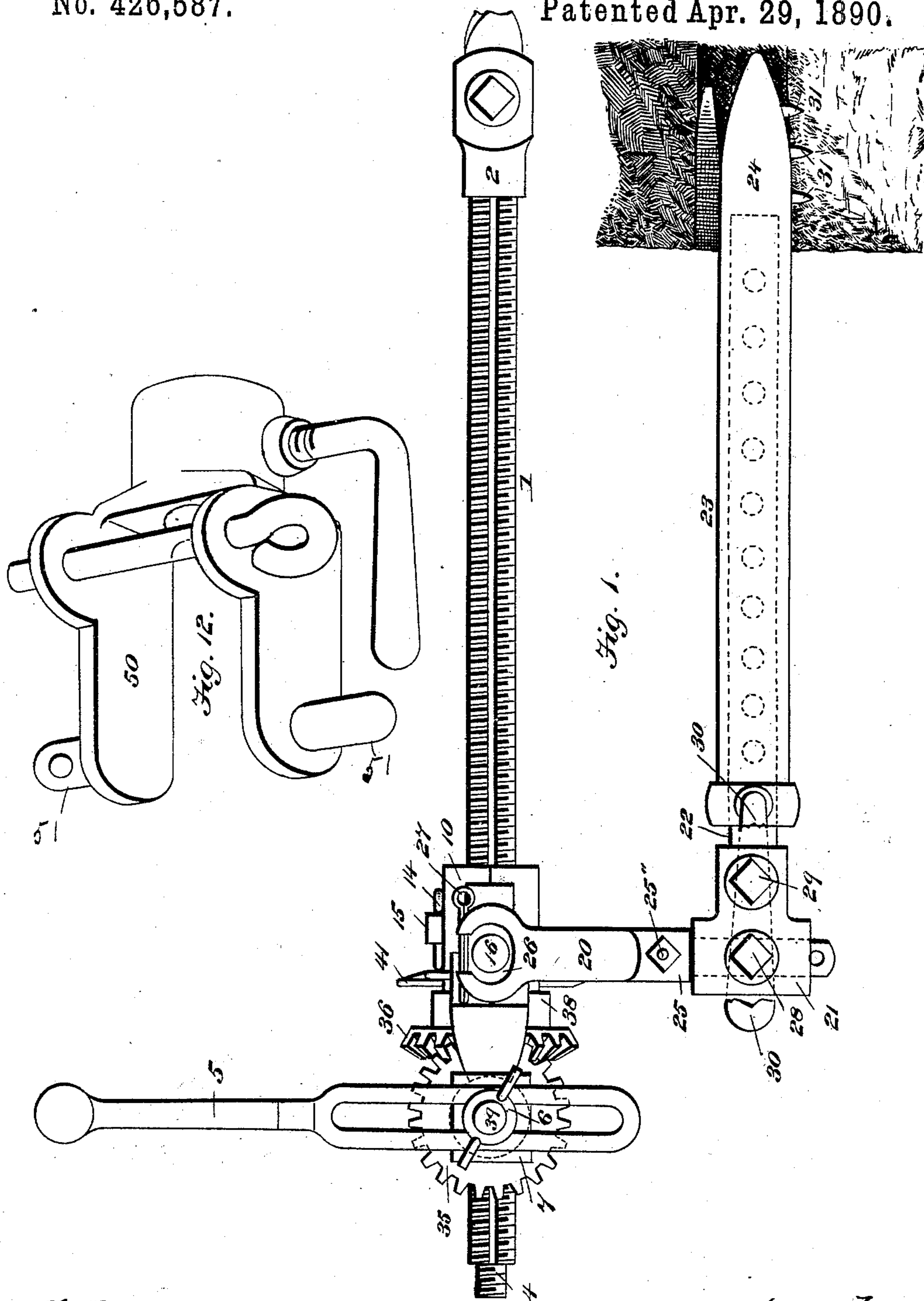
(No Model.)

5 Sheets—Sheet 1.

M. HARDSOCG.  
COAL DRILLING MACHINE.

No. 426,587.

Patented Apr. 29, 1890.



Witnesses:

*E. H. Hickey*  
*E. E. Surpin*

Inventor:  
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By *James Sheehy*  
Attorney.

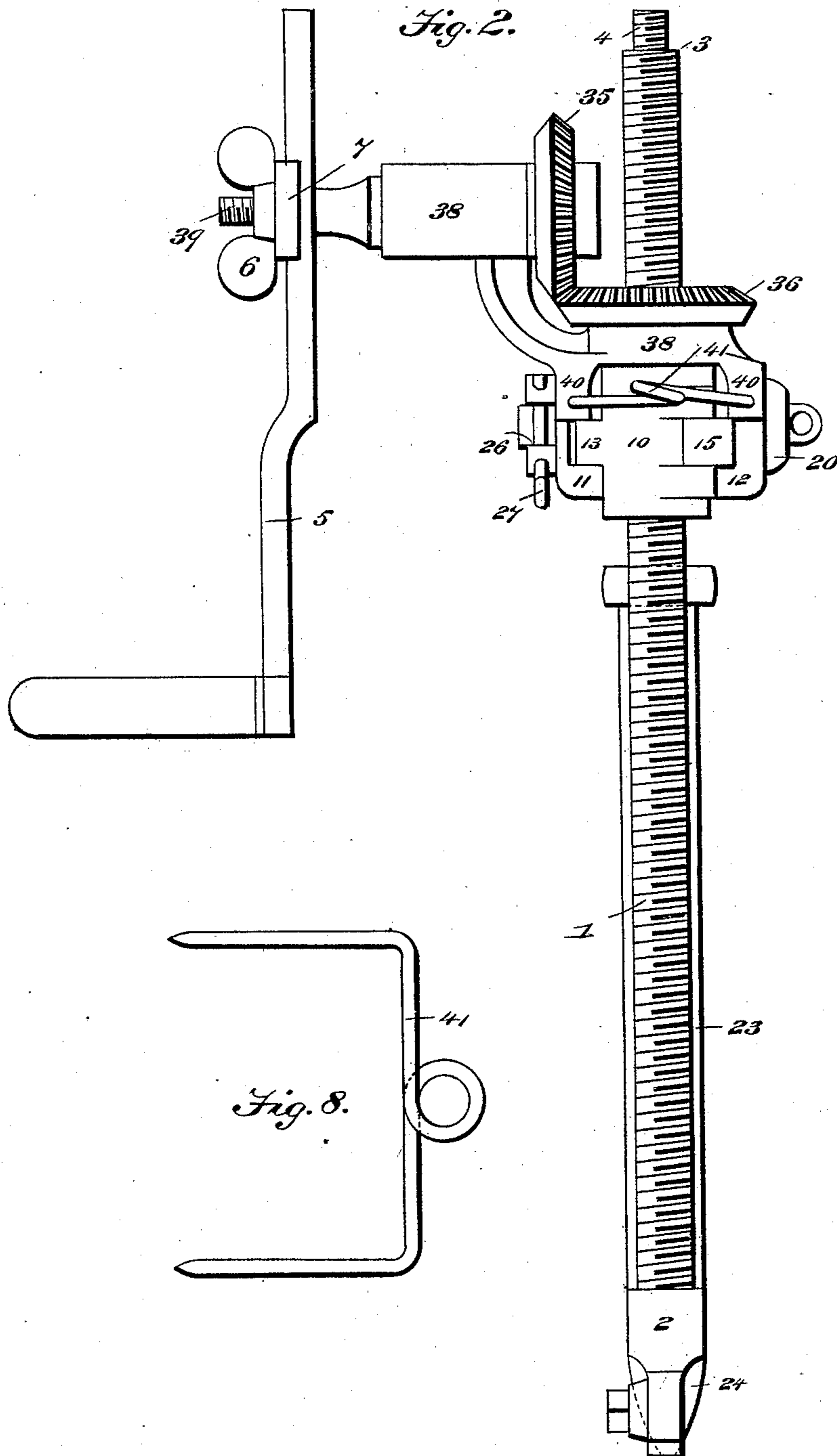
(No Model.)

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Witnesses

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5 Sheets—Sheet 3.

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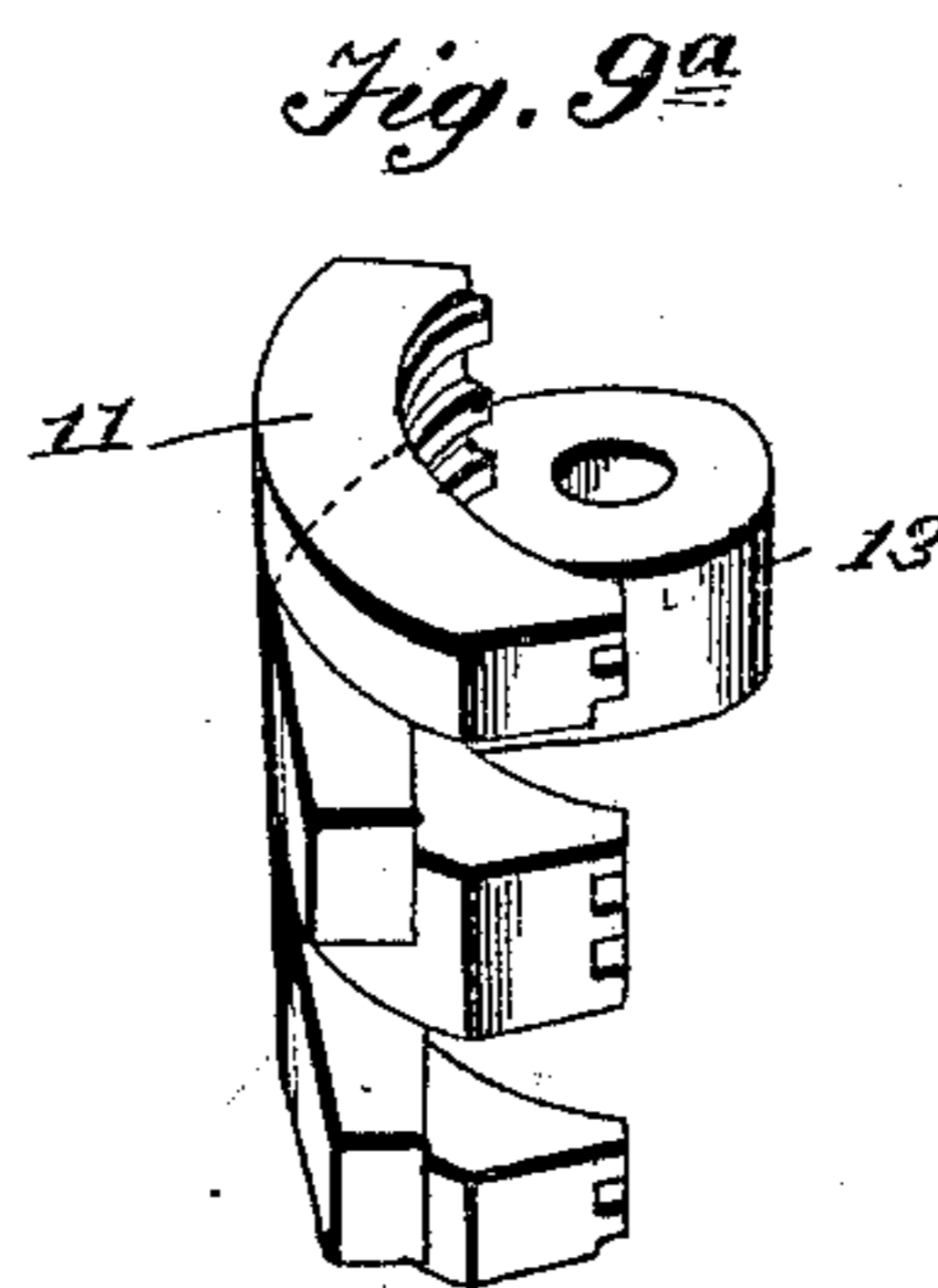
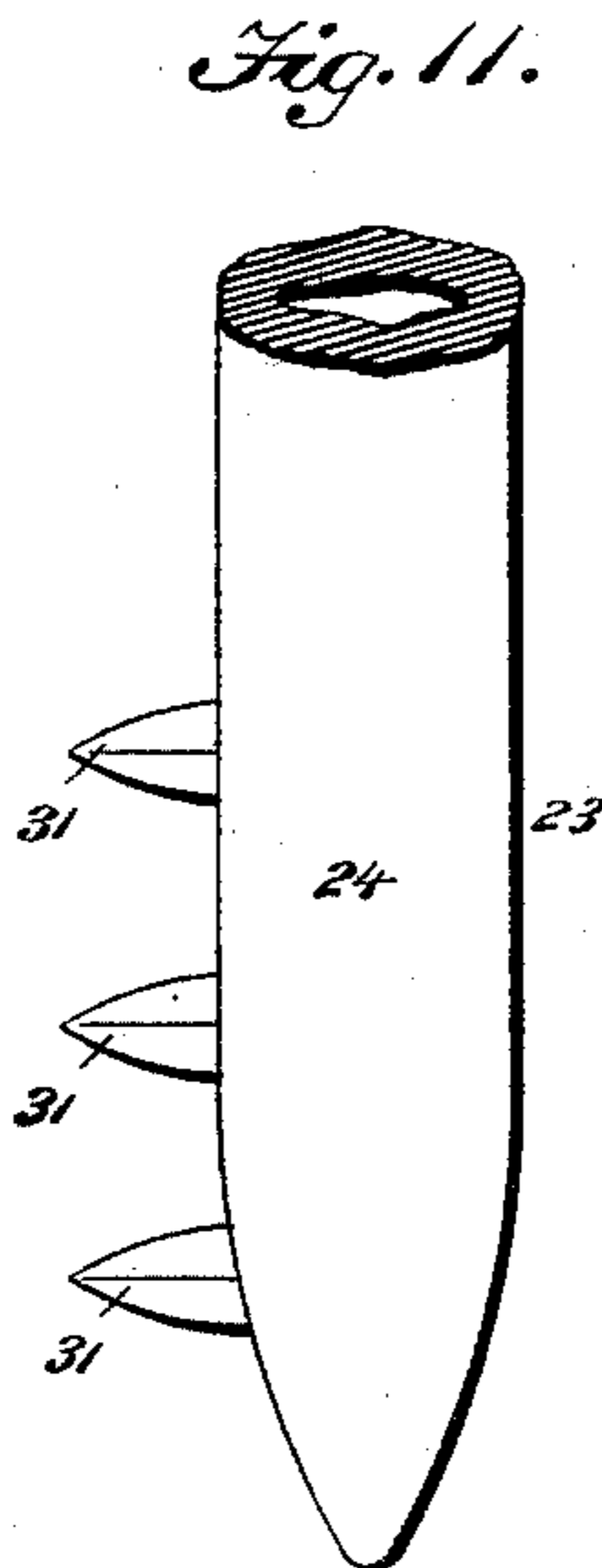
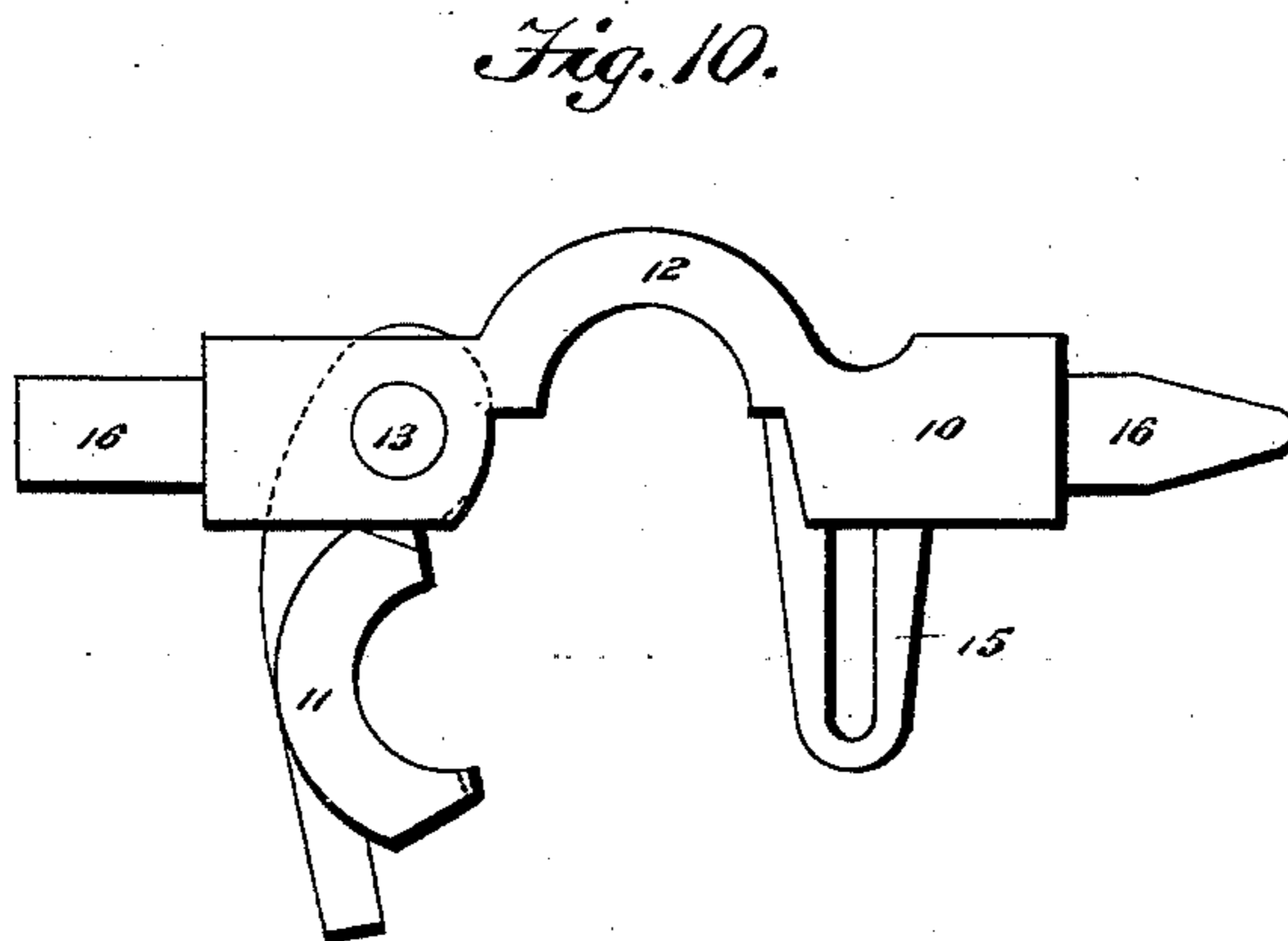
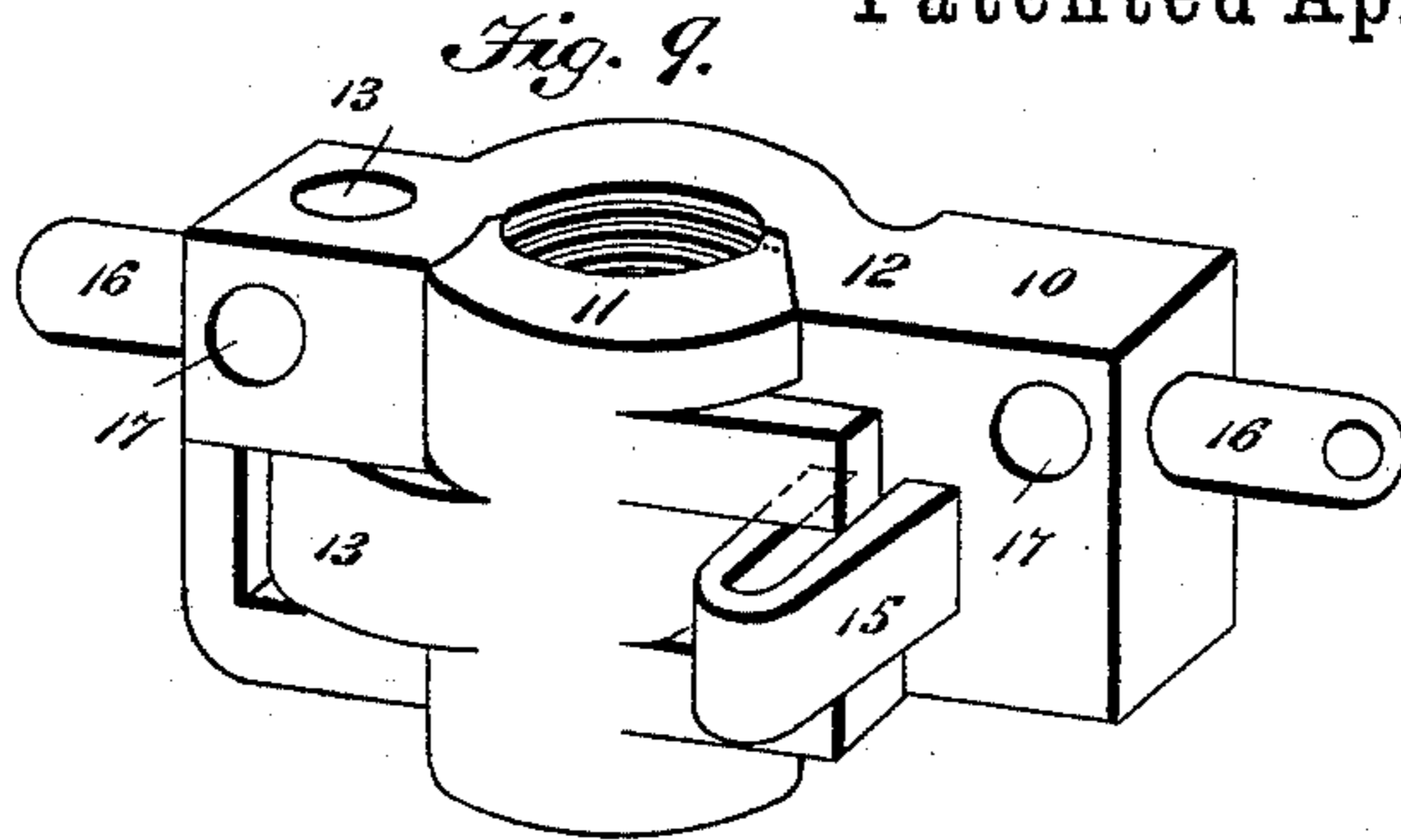
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5 Sheets—Sheet 4.

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Witnesses

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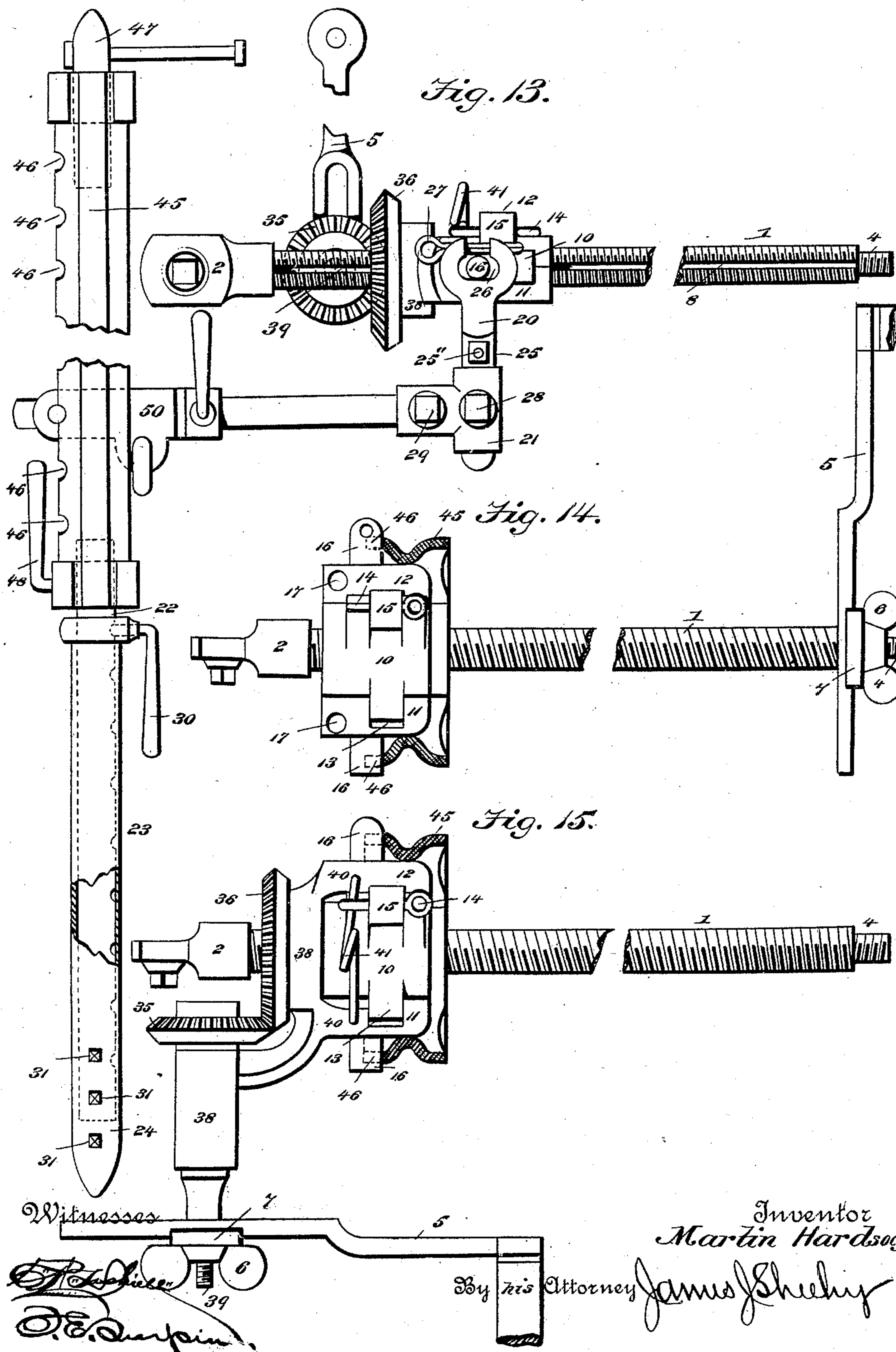
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5 Sheets—Sheet 5.

M. HARDSOGG.  
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Patented Apr. 29, 1890.



# UNITED STATES PATENT OFFICE.

MARTIN HARDSOCC, OF OTTUMWA, IOWA.

## COAL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 426,587, dated April 29, 1890.

Application filed September 27, 1889. Serial No. 325,242. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN HARDSOCC, a citizen of the United States of America, residing at Ottumwa, in the county of Wapello and State of Iowa, have invented certain new and useful Improvements in a Coal-Drilling Machine; and I do 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.

My invention relates to improvements in coal-mining machines, and among other things one of the objects of the invention is to provide means whereby the feed-shaft of the machine can be supported either in the bed of the coal or in an upright supporting-frame within a mine, the devices for providing these separate supports for the feed-shaft being readily and easily detachable and adjustable, so that they can be interchanged at will to adapt the machine to the different conditions under which the feed-shaft is to be supported.

To enable others to more readily understand my invention, I will now proceed to a detailed description of the same, in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a coal-mining machine, showing it adapted to be supported in the bed of coal; and Fig. 2 is a top plan view of the machine, showing it adjusted and adapted for service, as in Fig. 1. Fig. 3 is a detached view in elevation of the bracket, the gearing, the upright support, and the T-coupling. Fig. 4 is a detail view in side elevation of the bracket and the gearing. Fig. 5 is a bottom plan view of the bracket and the gearing, showing the splines in the feed-shaft gear that fit into the longitudinal grooves of the feed-shaft. Figs. 6 and 7 are detail views of the two parts or members of the upright supporting-bracket for the bearing or box of the feed-shaft. Fig. 8 is a detail view of the key for connecting the bracket and box or bearing together. Fig. 9 is a detail perspective view of the box or nut. Fig. 9<sup>a</sup> is a similar view of one of the jaws of the boxing or nut attached. Fig. 10 is a plan view of said box or bearing, showing the hinged member of the same thrown open. Fig. 11 is an enlarged detail view of the tapered end of the stock, showing the spurs or

barbs thereon. Fig. 12 is a perspective view of the bracket for supporting the drill in the upright frame, showing the locking-pin in position. Fig. 13 is a side elevation, showing the drill supported in the upright frame and the means for holding the latter in place. Fig. 14 is a view of the feed-shaft and its box or nut in plan and the upright frame in horizontal section, showing the nut journaled directly in the frame; and Fig. 15 is a view similar to Fig. 14, showing the bracket, the attached gearing, and the crank applied to the nut or box for the feed-shaft.

Like numerals of reference denote corresponding parts in all of the figures, referring to which—

1 designates the screw-threaded feed-shaft of my improved coal-mining machine. This shaft carries at one end a socket 2, which receives the auger (not shown) which penetrates the bed of coal, and at its other end the feed-shaft is reduced to form a shoulder 3 and threaded stud 4, on which the crank 5 can be fitted, as indicated in Fig. 14, when it is desired to operate the feed-shaft without intermediate power-gearing, the crank being clamped against the shoulder by a nut 6, between which and the handle is interposed a washer or plate 7, having flanges that fit over the edges of the crank. This feed-shaft is provided with longitudinal grooves 8, located diametrically opposite to each other, and the feed-shaft works in a box or nut 10. (Shown in detail in Figs. 9 and 10.)

I will first proceed to describe my invention as adapted to penetrate and be supported in the bed of coal, as indicated in Figs. 1 and 2, detail views of the several parts being shown in Figs. 3 to 11, inclusive.

The nut or box 10 consists of two members or sections 11 12, which are internally threaded to receive the feed-shaft, and one member 11 is hinged or pivotally connected, as at 13, to the other member, so that the box can be opened to permit the feed-shaft to be readily removed from the box. The free end of the member 11 is confined in place by a key or pin 14, so as to keep the box closed, said key entering a slotted keeper 15, which is made integral with the member 12 and fits between lugs on the free ends of the member 11.

To compensate for wear between the threads

of the box or nut, the hinged member of the box has the terminals of the screw-threads extended or projected beyond its ends, as shown by dotted lines in Figs. 9 and 10, instead of terminating flush therewith, as is customary, and when the threads of the box or the feed-shaft become worn and the shaft moves or plays in the box the projecting ends of the threads can be filed off to adapt the members of the box to be fitted or adjusted closer to each other and upon the feed-shaft, thus taking up the lost motion in the feed-shaft and rendering the bearing serviceable for a longer period of time than is possible when the nut is made to fit closely to the feed-shaft when the parts are first made and fitted together. The nut is further provided at its sides with outwardly-projecting trunnions 16, one of which has a transverse perforation, and transversely through the box or nut are formed apertures 17, which lie at right angles to the axis of the trunnions on opposite sides of the threaded central socket of the nut, the function of which parts will appear presently.

The box or nut 10 is supported in an upright bracket 20, the lower end of which is fitted in a T-coupling 21, fixed to the outer end of a horizontal arm 22, which forms one member of an extensible stock 23, the other member 24 of which is made hollow to receive the member 23 and is adapted to be forced into the bed of coal and be wedged therein, so as to firmly support the machine in place. The upright support 20 consists of two separable members 25' 25', (see Figs. 6 and 7,) each of which consists of an upper diverging portion or arm and a semi-cylindrical lower portion or shank, which are applied laterally together and united by a through-bolt 25'' to form the complete device, consisting of a straight round shank and two diverging arms.

Between the arms of the upright support is fitted or arranged the box or nut 10, and in an eye of one of said arms is fitted one of the trunnions of said nut, while the other trunnion thereof fits in an open slot 26, formed in the upper end of the other arm of said upright support, the nut being pivotally mounted in the upright support, so as to rock vertically therein, and being held in place by means of a key 27, (see Fig. 1,) which passes through aligned openings formed in the slotted arm of the upright support to prevent vertical displacement of the nut.

The lower end or shank of the upright support is round and fits in the hollow T-coupling and is clamped therein by a set-screw 28, this support being capable of a horizontal axial adjustment in the T-coupling to permit the feed-shaft to be adjusted or turned horizontally at different angles to the supports thereof. The T-coupling is clamped by a set-screw to the outer member 22 of the stock 23, and this member is adjustable longitudinally in the hollow member 24 of said stock. The two parts are clamped together by a binding-screw 30, and the hollow mem-

ber of the stock is provided with radial spurs or barbs 31, adapted to penetrate the bed of coal when the stock is wedged therein; but it is obvious that the two parts can be reversed without departing from the spirit of my invention—that is, the solid member 22 can be provided with the spurs or bars and adapted to penetrate the coal, while the hollow member can be fitted in the T-coupling.

The feed-shaft is operated by gearing 35 36, the gear 36 being provided with two splines 37, which enter the longitudinal grooves in the feed-shaft. The bevel-gears mesh with each other, and they are carried by a bracket 38, having an arm 38', in which one of the two gears 35 is journaled, the other gearing 36 being journaled in the bracket, and the gear 35 has a shaft 39 secured thereto, to which shaft the crank is fixed, as shown in Figs. 1 and 2. The gear 36 fits around the feed-shaft and is arranged in line with the nut or box 10, and the base of the bracket is provided with four depending lugs 40, which are perforated transversely, as shown. These lugs are arranged so as to fit over the sides of the nut or box when the bracket is placed thereon and so that the apertures in said lugs align with the apertures 17 in the nut, and the bracket is detachably secured to the nut by means of a key or fastener 41, (shown in Fig. 8,) the two prongs of which pass through all of the lugs on the bracket and the apertures in the box or nut.

It is obvious that when the crank is rotated the gearing and box or nut operate to impart a longitudinal and rotary motion to the feed-shaft, and that said shaft can be turned or adjusted both vertically and horizontally, as well as moved endwise, with its operating mechanism toward and from the coal to be operated upon.

In Fig. 13 I have shown my improvements applied to an upright supporting-frame 45, which is held in the mine by suitable contrivances. This frame is open or hollow, and is provided in one side thereof with coincident notches 46, and the ends of the frame receive a pintle 47 and the stock 23, which stock is adapted to be detached from the T-coupling and applied to the upright supporting-frame. One member of the extensible stock is clamped by a screw 48 to the lower end of the frame 45, while the other barbed member of the stock is forced into the floor of the mine, and the pintle 47 is adapted to be forced into the roof of the mine, whereby the frame is held in a firm steady upright position.

When it is desired to operate the feed-shaft by the gearing, the bracket is connected to the nut and the latter to the upright support, as indicated in Fig. 13, said upright support being clamped in the coupling, which in turn is secured on the horizontal arm 22. Instead of securing this arm 22 in the hollow stock, as in Figs. 1 and 2, said arm is fitted and clamped in a bracket 50, (indicated in Fig. 12,) and the sides of said bracket are parallel and

provided with trunnions 51, whereby the bracket can be fitted between the sides of the frame 45 and the trunnions thereof adjusted in the coincident notches 46. This bracket, with its trunnions fitting in the notches of the frame, provides for the vertical rocking of the feed-shaft as well as the vertical adjustment of the feed-shaft and its operating devices bodily in the frame, and the bracket is prevented from disengagement with the frame because the feed-shaft which enters the coal presses rearward against the bracket, and thereby forces the latter firmly against the frame, as is obvious.

The feed-shaft may be operated by the gearing without the use of the horizontal arm, the T-coupling, and upright support; but when so adapted for use the feed-shaft cannot be turned horizontally with facility.

In Fig. 15 I have shown the box or nut 10 fitted between the sides of the frame 45, with its trunnions 16 fitted in the notches of the frame, and the bracket is secured by the key to the nut, the shaft of the gear 35 being arranged at one side of the frame and extending outwardly therefrom, so that the crank can be readily rotated without interference from the frame.

The gearing may be dispensed with and the feed-shaft operated by applying the crank to the end of said shaft, as indicated in Fig. 14.

The bracket is readily detached by simply removing the key and slipping the gear 36 off the feed-shaft, and the nut can be fitted between the sides of the frame 45 with its trunnions in the apertures thereof, as shown. The nut-box is held in place by the pressure of the feed-shaft forcing the trunnions thereof against the upright frame, and the nut and shaft can be rocked vertically on the trunnions of the bearing, while said parts can be adjusted bodily in a vertical direction on the frame.

The operation and advantages of my invention will be readily apparent to those skilled in the art to which it relates from the foregoing description, taken in connection with the drawings.

It is obvious that by a few simple adjustments in the position of parts my invention can be adapted for use either in the bed of coal or on a frame supported in the mine, and that the feed-shaft can be operated directly by the crank or by gearing intermediate of the crank and said shaft.

Changes in the detail of construction and form and proportion of parts can be made without departing from the spirit of my in-

vention, and I would therefore have it understood that I reserve the right to make such modifications as fairly fall within the scope of my invention.

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

1. In a coal-mining machine, the combination, with a support, of a nut or boxing mounted thereon carrying a feed-shaft and a bracket detachably secured to the boxing carrying gears for operating the feed-shaft, substantially as described.

2. In a coal-mining machine, the combination, with a support, of a nut or box mounted thereon carrying a feed-shaft and having transverse openings, a bracket having perforated ears fitting over the sides of the nut, the perforations of which register with the transverse openings of the nut, a key through the perforations for securing the bracket to the nut, and gears in the bracket for operating the shaft, substantially as described.

3. The combination, with a horizontal support, of a hollow T-coupling mounted on one end, an upright support consisting of two separable pieces, the upper portions of which diverge and form arms, and the lower portions of which are each semi-cylindrical and fit within the T-coupling, a box or nut supported by the arms carrying a feed-shaft, and a bracket detachably secured to the nut carrying gear-wheels for operating the shaft, substantially as described.

4. In a coal-mining machine, the combination, with an upright frame having coinciding notches upon one side, of a pintle at one end and an extensible stock secured to the other end of said frame, a bracket supported in the frame, and a horizontal arm adapted to sustain the drilling mechanism, said arm being capable of adjustment back and forth with relation to said upright frame, substantially as described.

5. A threaded box or nut for coal-mining machines, consisting of two members pivotally secured together at one end, the threads of one member of which are projected or extended beyond the face of the free end of the same, for the purposes described, substantially as specified.

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

MARTIN HARDSOCC.

Witnesses:

WM. A. BELL,  
J. W. LESAN.