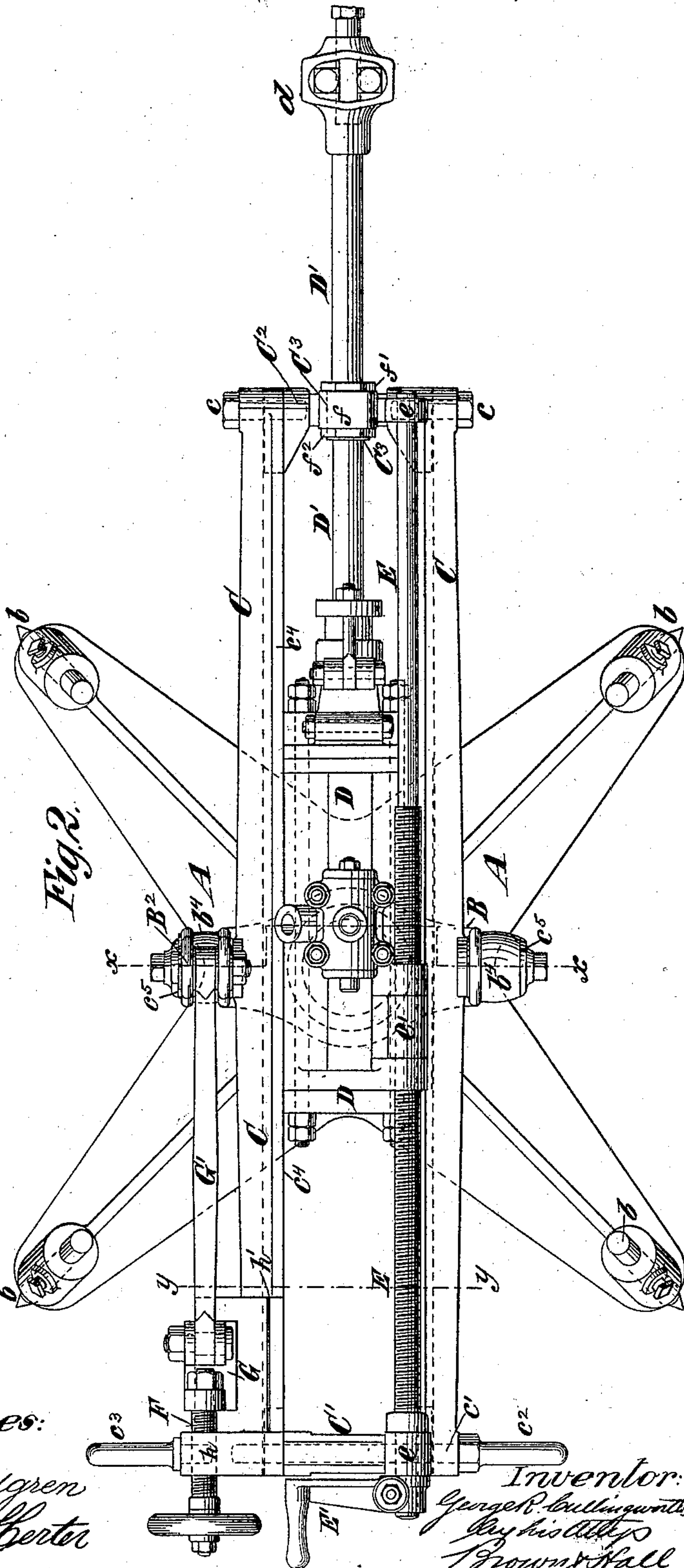


2 Sheets—Sheet 1.

Patented June 28, 1887.



O. Sundgren
Emil Hertel

George R. Bullingworth
By his attys
Brown & Hall

(No Model.)

2 Sheets—Sheet 2.

G. R. CULLINGWORTH.
COAL DRILLING MACHINE.

No. 365,732.

Patented June 28, 1887.

Fig. 3.

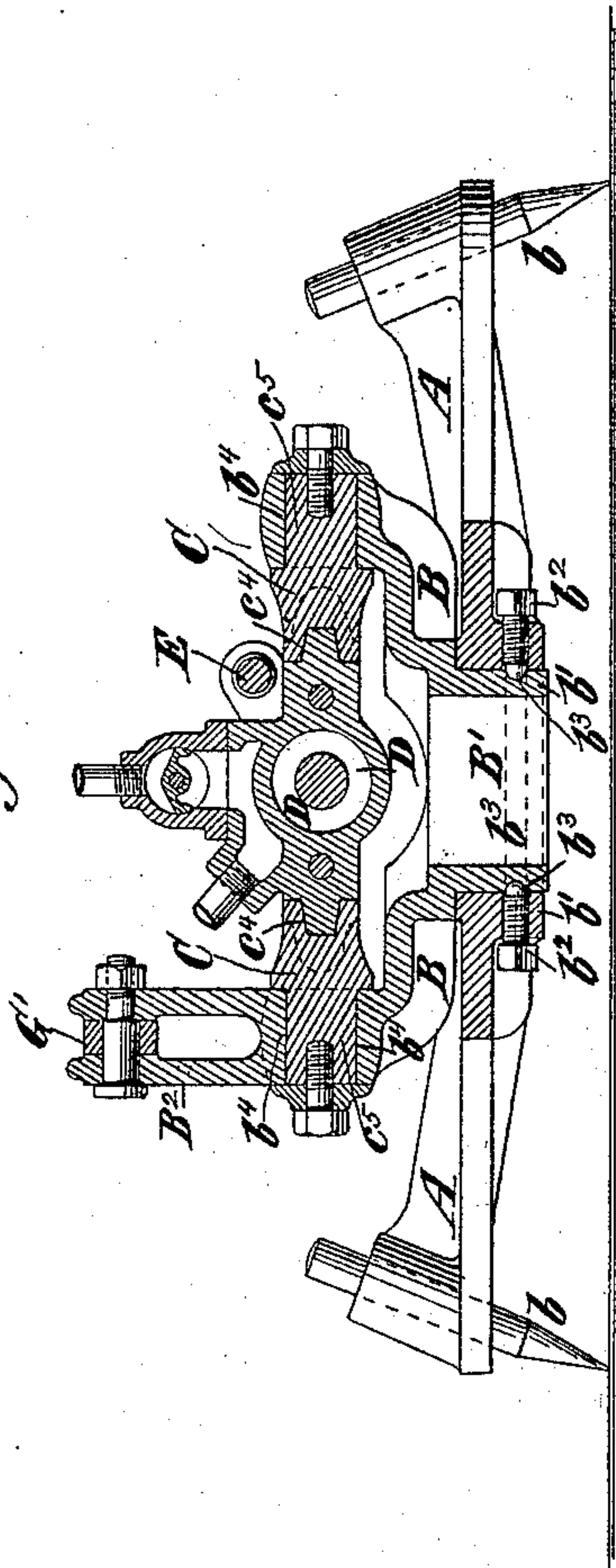


Fig. 4.

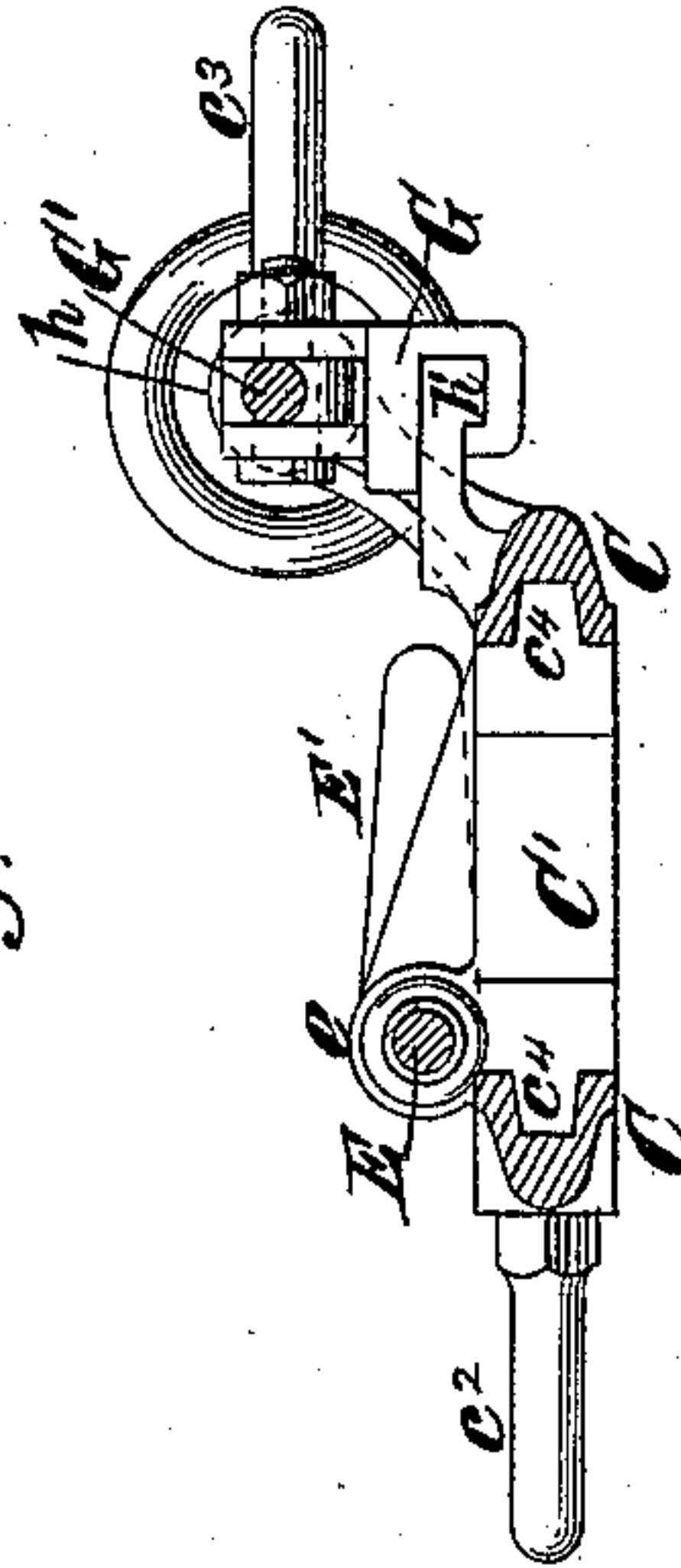


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE R. CULLINGWORTH, OF NEW YORK, N. Y.

COAL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 365,732, dated June 28, 1887.

Application filed June 5, 1886. Serial No. 204,201. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. CULLINGWORTH, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Coal-Drilling Machines; of which the following is a specification.

My invention relates to coal-cutting machines which comprise a rock-drill supported in an approximately horizontal position, and so that it may be swung in a horizontal plane, and also tilted in a vertical plane, so that the axis of the rock-drill and its piston-rod and drill or bit will be more or less inclined relatively to a horizontal line.

In my United States Letters Patent No. 328,196, dated October 13, 1885, I have shown a rock-drill comprising a fluid-actuated piston and a cylinder which is so supported that the rock-drill may be swung by hand in a vertical plane, and held by hand at different angles while being operated. In that patent the cylinder of the rock-drill is immovably held lengthwise relatively to the pivots or trunnions which support it, although it may be swung in horizontal and vertical planes.

One object of my invention is to provide a frame-work having pivots or trunnions and bearings which enable the rock-drill to be swung in horizontal and vertical planes, and in which the drill cylinder and the entire rock-drill proper may be moved for feeding by an ordinary feed-screw.

A further object of my invention is to provide mechanical means whereby the frame, in which the rock-drill may be moved lengthwise, is so connected with a yoke, wherein the frame is pivoted to swing in a vertical plane, that said frame may be positively adjusted at different angles to a horizontal line in said vertical plane and held at the desired angle after being so adjusted.

The invention will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a plan thereof. Fig. 3 is a transverse section on the plane of the dotted line *xx*, Fig. 2. Fig. 4 is a similar section on the plane of the dotted line *yy*, Fig. 2, and looking toward the left from said line; and Fig. 5 is a detail view, hereinafter described, illustrating a longitudinal section of a renewable guide which is provided in the swinging

frame, and which receives the reciprocating piston-rod of the rock-drill.

Similar letters of reference designate corresponding parts in all the figures.

A designates a base portion or spider, which is provided with adjustable feet *b*, whereby it is supported upon the floor of a gallery or level in which the machine is used.

B designates a yoke or fork having a downwardly-projecting and vertical pivot or trunnion, *B'*, which is fitted to a bearing or socket, *b'*, in the base portion or spider A, and which provides for turning the yoke B in a horizontal plane and relatively to the base portion A.

The trunnion or pivot *B'* may be held against vertical displacement in the socket or bearing *b'* by means of screws *b²*, inserted transversely into said socket or bearing and engaging a circumferential groove, *b³*, in the pivot or trunnion *B'*, as shown in Fig. 3.

In the yoke or fork B is mounted a swinging frame, which, as here represented, comprises parallel side portions or bars, C, and end portions, *C' C²*. The end portions, *C' C²*, are made separate from the side portions, C, and are secured thereto by bolts *c c'*. The bolt *c'* may have its head so formed as to form a handle, *c²*, whereby the frame may be swung, and at the opposite side of the frame a similar handle, *c³*, may be provided.

The side portions, C, of the swinging frame are provided on their inner sides with parallel grooves or channels *c⁴*, or are otherwise so constructed as to receive and properly guide a rock-drill, of which D designates the cylinder. This rock-drill may be of any suitable construction and provided with any suitable valve mechanism, and *D'* designates the piston-rod, which is provided at the end with a chuck, *d*, in which the drill or bit may be secured. The rock-drill may be moved lengthwise in the swinging drill-supporting frame in order to feed it forward to its work by means of a feed-screw, E, which may be turned by a crank or handle, *E'*, and which is fitted to bearings *e* in the end portions, *C' C²*, of the drill-supporting frame and engages a nut, *e'*, upon the drill-cylinder. By means of the screw E the drill-cylinder may be moved the length of the drill-supporting frame in a well-understood manner, in order to feed the drill to its work.

As the piston-rod *D'* will be of considerable

length, I provide a guide for said rod in the end piece, C^2 , of the drill-supporting frame, and the construction of this guide is best shown in Fig. 5. The end piece, C^2 , of the frame is provided with a cylindric socket or bearing, f , in which is fitted a renewable bushing or thimble, C^3 . As shown in Fig. 5, this bushing or thimble has at one end a flange or shoulder, f' , and at the opposite end is provided with a nut, f^2 , whereby it is secured in place in the end piece, C^2 , of the drill-supporting frame. When this bushing or thimble C^3 becomes so worn as to no longer afford proper support to the piston-rod D' , it may be removed from the frame portion C^2 and a new bushing or thimble substituted.

The side pieces, C , of the drill supporting frame are constructed with trunnions c^5 , extending in opposite directions and about midway of their length, and said trunnions are fitted to bearings b^4 , formed in the yoke B , as best shown in Fig. 3. The trunnions c^5 and bearings b^4 provide for swinging the frame C C^2 , together with the rock-drill supported in it, in a vertical plane.

The yoke B has its middle portion depressed below the bearings b^4 , to accommodate the drill-supporting frame.

In order to so swing the drill-supporting frame and rock-drill in a vertical plane, and to hold it positively at different angles to which it may be adjusted, I have represented a screw, F , which is fitted to a nut, h , forming a part of the drill-supporting frame, and has a swiveled connection with a slide, G , fitted to a guide or slide way, h' , formed upon one of the side portions, C , of the frame, and as best shown in Fig. 4. At one of its bearings b^4 the yoke B is provided with an upwardly-extending arm, B^2 , and a rod, G' , connects the slide G with the upwardly-extending arm B^2 , as best shown in Figs. 1 and 2.

From the above description it will be understood that by turning the screw F in one or other direction the slide G will be moved lengthwise of the drill-supporting frame, and as the arm B^2 of the yoke forms a rigid abutment, to which one end of the rod G' is connected, the drill-supporting frame will by the movement of said slide G be swung in a vertical plane more or less, as may be desired, and by such connections will be held positively at the angle of elevation to which it is adjusted.

I am aware that it is not broadly new to employ supports for a rock-drill which provide for swinging the drill in vertical and horizontal planes, and in which the drill is movable lengthwise, and hence I only include in my invention the particular construction and combination of these supports, whereby a very substantial and simple frame-work is formed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a base portion, A , and a yoke, B , provided at the ends with

trunnion-bearings b^4 , which are in line and have horizontal axes, and having its middle portion depressed below the bearings and provided with a vertical pivot, B' , fitting a bearing in the base portion, of a drill-supporting frame provided on opposite sides with horizontal trunnions c^5 , fitting the bearings b^4 in the yoke, whereby provision is afforded for swinging the frame in both horizontal and vertical planes, a rock-drill comprising a fluid-actuated piston, and a cylinder fitted to guides in the frame, and a feeding-screw, whereby the rock-drill may be moved lengthwise of the frame, substantially as herein described.

2. The combination, with a base portion, A , and a yoke, B , supported therein by a vertical pivot and depressed between its ends, of a drill-supporting frame provided at opposite sides with horizontal trunnions fitting bearings in the yoke, whereby provision is afforded for swinging the frame in horizontal and vertical planes, a rock-drill comprising a fluid-actuated piston and a cylinder movable lengthwise in the frame, and an adjusting screw and connection between the frame and the yoke, whereby the frame may be tilted in and relatively to the yoke at different angles in a vertical plane and held in place at the desired angle, substantially as herein described.

3. The combination, with the base portion A , the yoke B , supported by a vertical pivot in the base portion, and a drill-supporting frame provided at opposite sides with pivots or trunnions fitting bearings in the yoke, whereby provision is afforded for swinging said frame in horizontal and vertical planes, of a rock-drill comprising a fluid-actuated piston and a cylinder movable lengthwise in the frame for feeding it forward to the work, and having its piston-rod fitted to a bearing in the end of said frame, whereby the piston-rod is always guided in the frame whatever be the position of the drill-cylinder lengthwise of the frame, substantially as herein described.

4. The combination, with a drill-supporting frame, of a rock-drill comprising a fluid-actuated piston and a cylinder movable lengthwise in the frame for feeding it forward to the work, and the bushing C^3 , secured in the end portion of said frame by the shoulder and nut $f' f^2$, and forming a renewable guide for the piston-rod, substantially as herein described.

5. The combination, with a base portion, a yoke, and a drill-supporting frame provided with pivots or trunnions and bearings, as described, whereby provision is afforded for swinging the frame in horizontal and vertical planes, of a rock-drill movable lengthwise in the frame for feeding it to its work, a slide fitted to the frame and connected by a rod with the yoke, and a screw, whereby the slide may be adjusted on the frame to vary the angle of the said frame in a vertical plane, substantially as herein described.

Witnesses: G. R. CULLINGWORTH.

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HENRY J. MCBRIDE.