

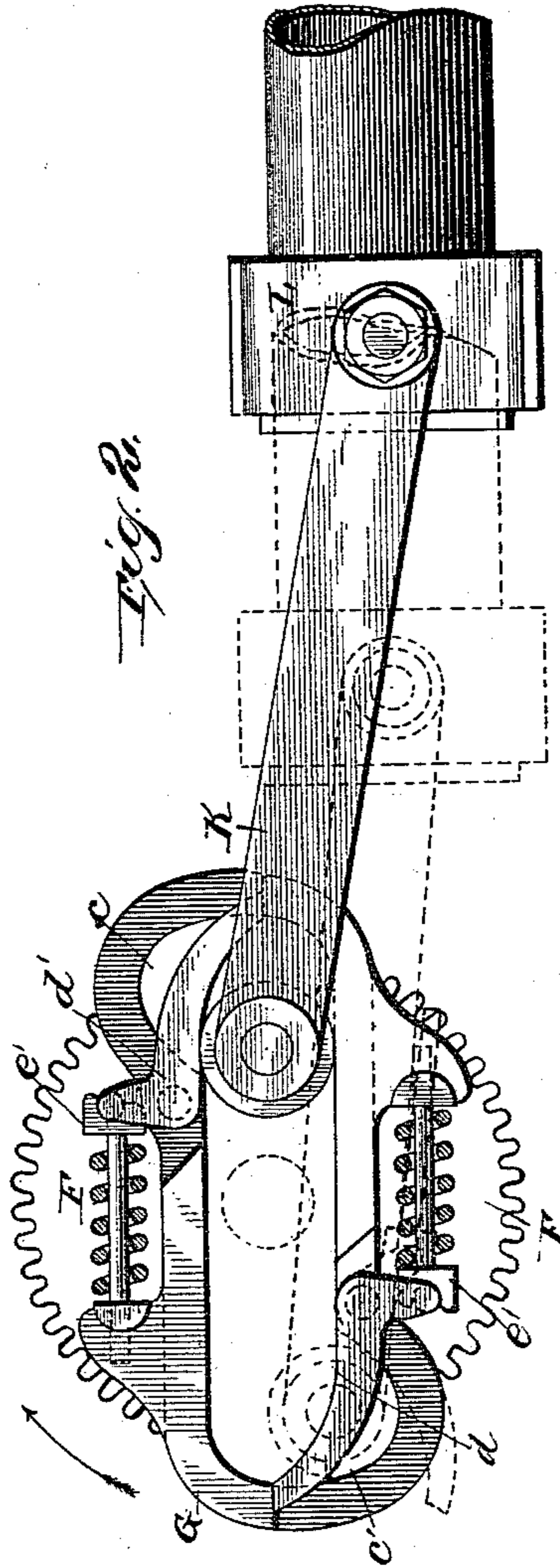
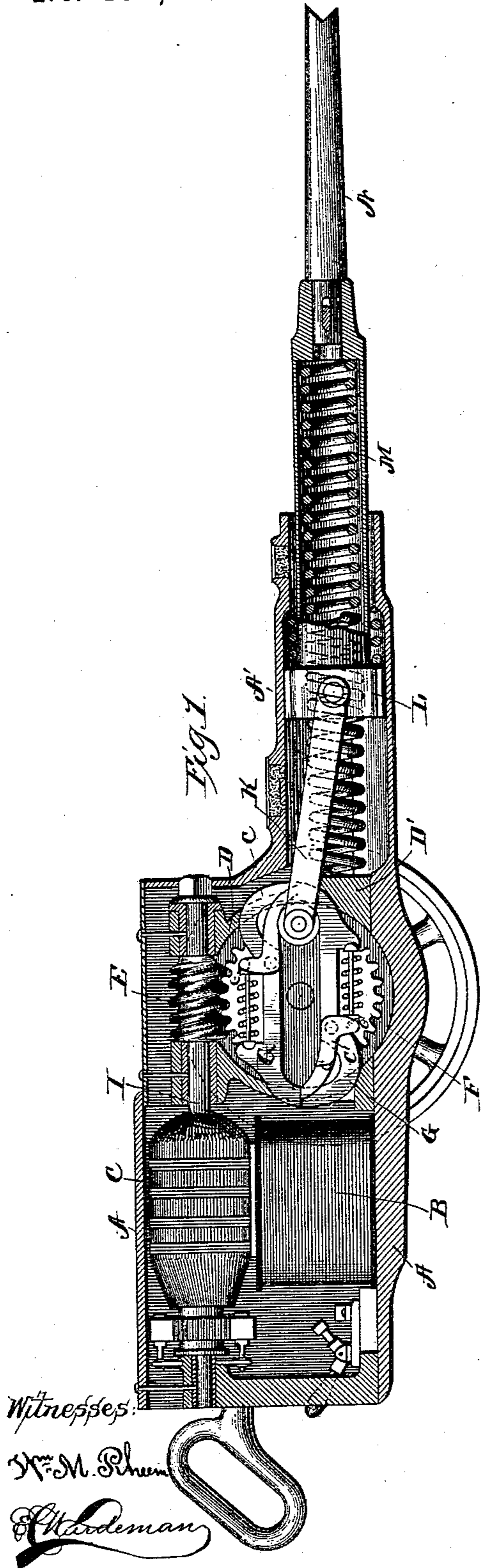
(No Model.)

2 Sheets—Sheet 1.

E. C. MORGAN.
ELECTRIC COAL MINING MACHINE.

No. 458,184.

Patented Aug. 25, 1891.



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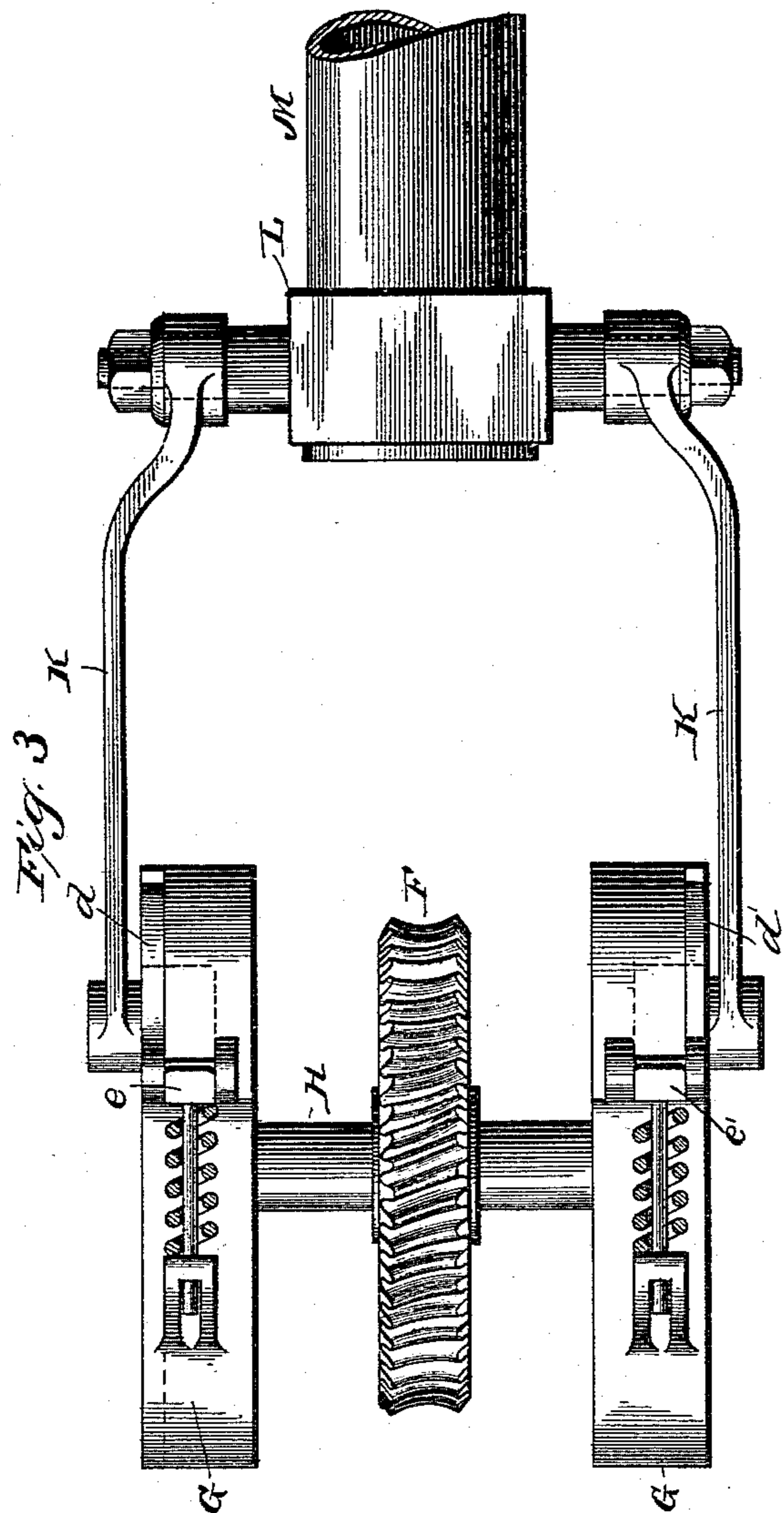


Fig. 3.

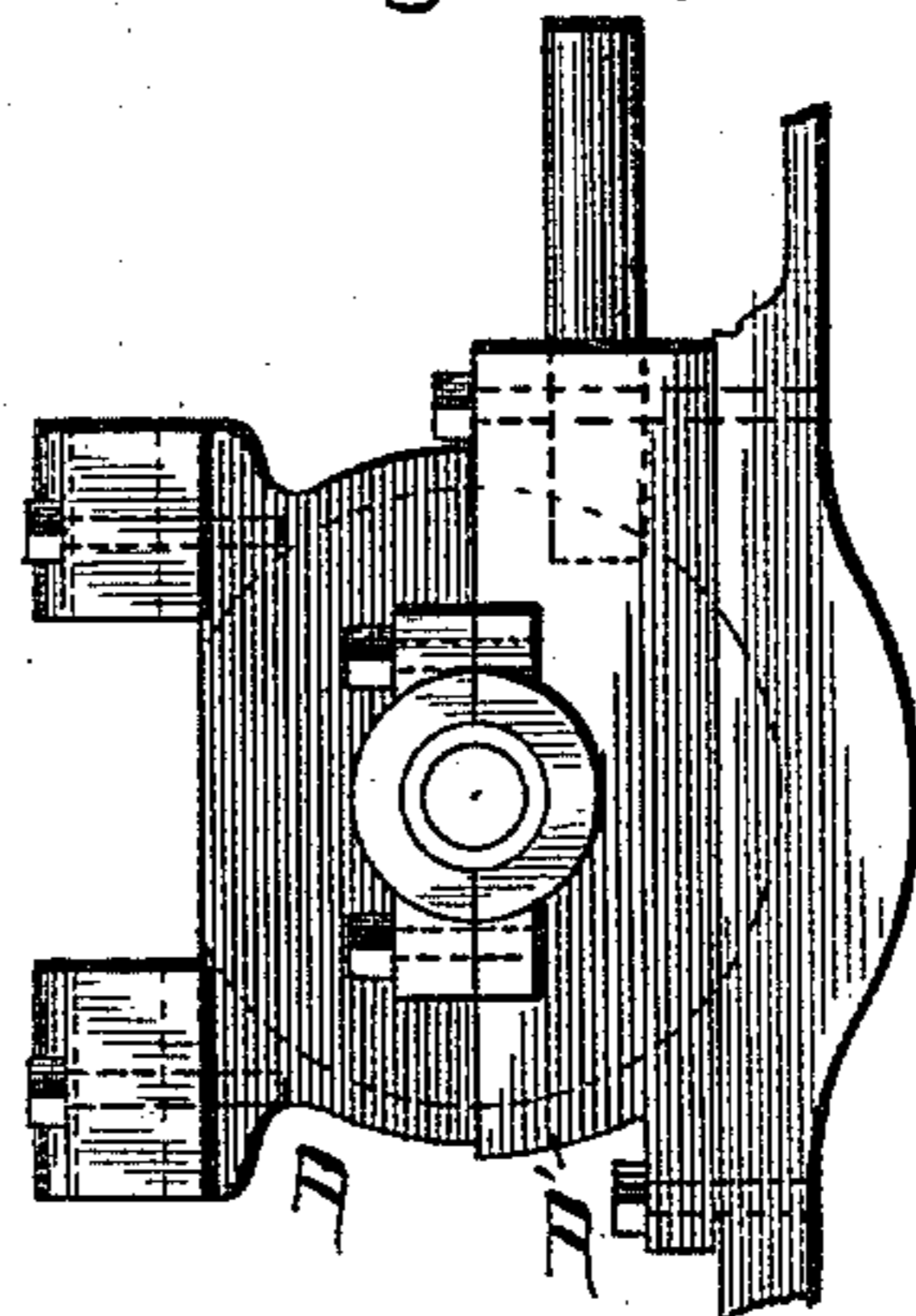


Fig. 9.

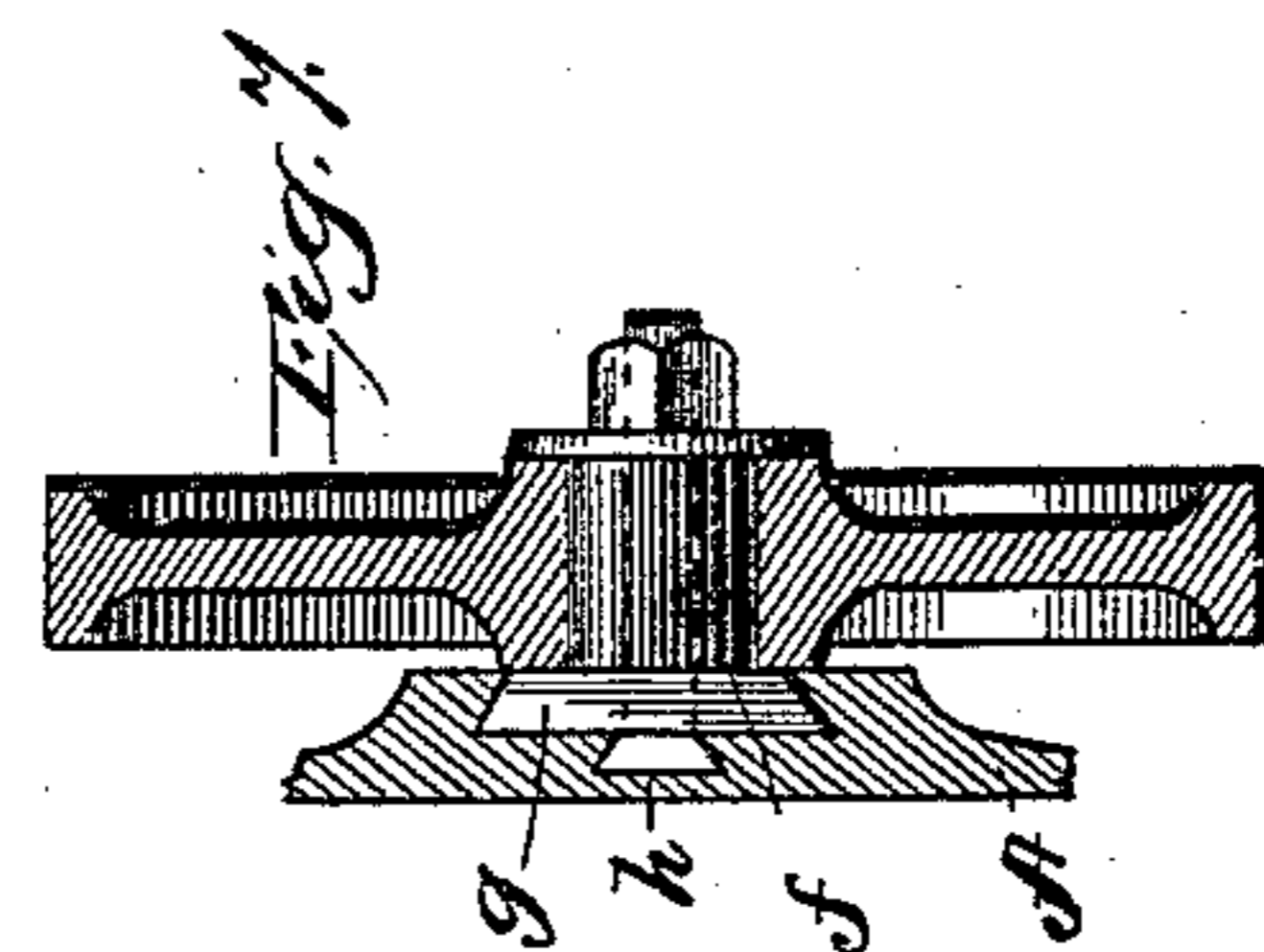
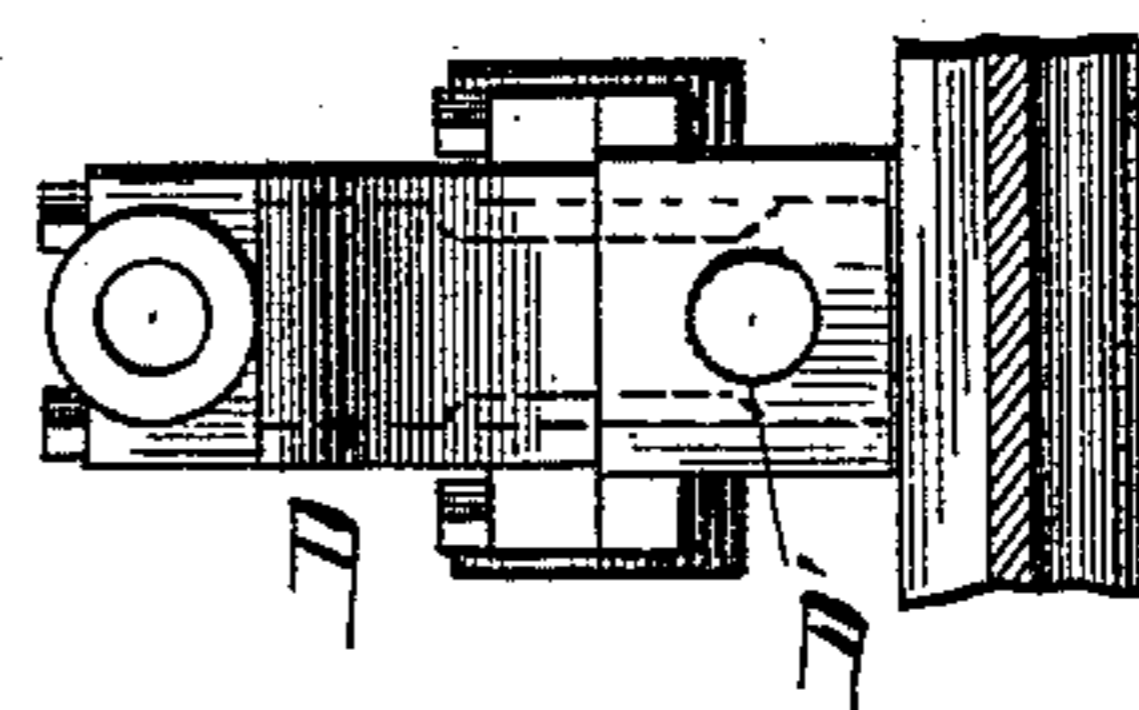


Fig. 7.

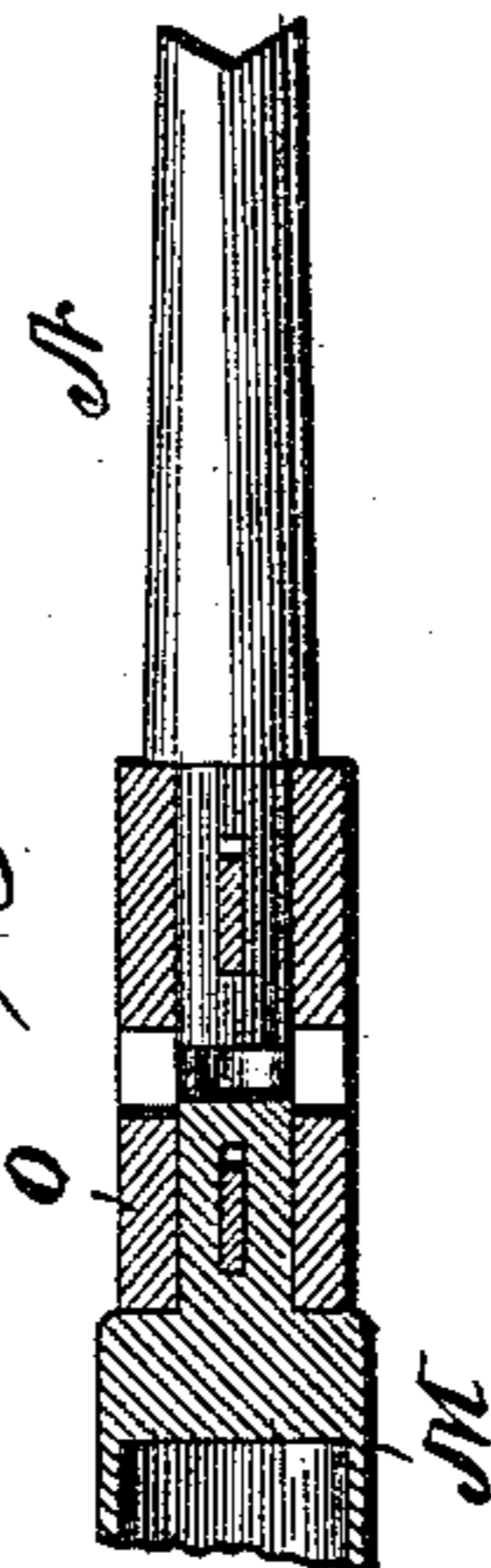
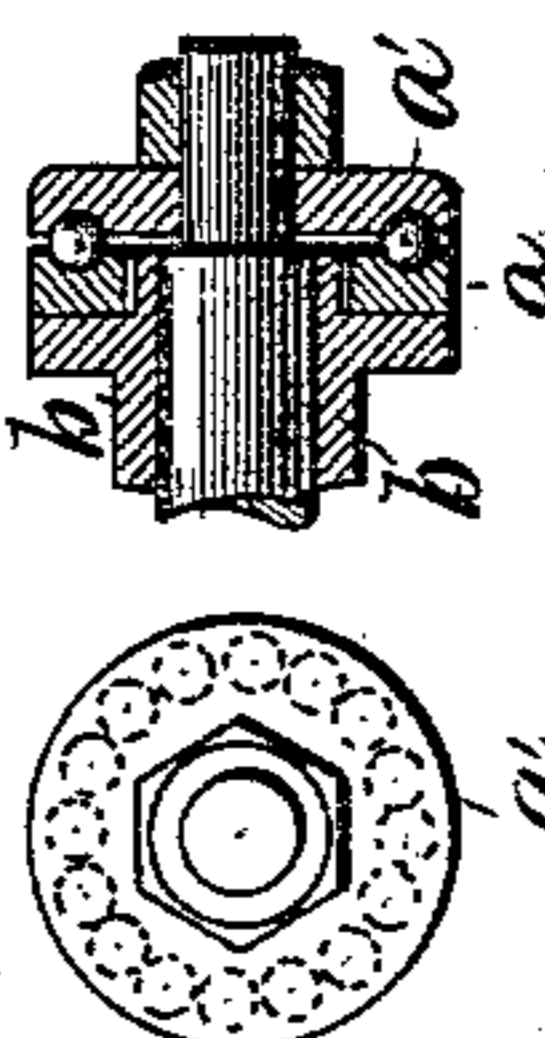


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDMUND C. MORGAN, OF CHICAGO, ILLINOIS.

ELECTRIC COAL-MINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 458,184, dated August 25, 1891.

Application filed September 15, 1890. Serial No. 365,039. (No model.)

To all whom it may concern:

Be it known that I, EDMUND C. MORGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Electric Coal-Mining Machines, of which the following is a specification.

My invention relates to an improvement in electrical coal-mining machinery, and its object is to simplify the construction of this class of machines and to make them more compact and efficient.

The invention consists in the construction and arrangement hereinafter described and claimed.

Like letters refer to the same parts in the several figures of the drawings, in which—

Figure 1 is a longitudinal and vertical section of the machine. Fig. 2 is a detail view in side elevation of the mechanical movement for operating the pick. Fig. 3 is a plan view of the same. Fig. 4 is a detail view, partly in section, of a modified device for securing the pick to its holder. Figs. 5 and 6 are end views and vertical sections, respectively, of the bearing for the worm-shaft. Fig. 7 is a vertical section of one of the wheels and devices for attaching the same to the frame. Figs. 8 and 9 are end views and side elevations, respectively, of the boxing for inclosing the mechanical movements.

The frame A of the machine is of any suitable shape and material, and is arranged to form a box or inclosure for containing most of the working parts of the device, and such frame may be provided with a projecting portion or extension A', for a purpose hereinafter to be set forth. Mounted preferably on the inside of the bottom of this box is one or more field-magnets B of any well-known construction, and suitably arranged to be thrown in and out of an electrical circuit. Also mounted upon the interior of the box and longitudinally of the same is an armature C, constructed in the usual manner, and having one end of its axis extended and formed with or connected to a worm E. This extension of the axis may be sustained in the ordinary journal-boxes, such as are shown in Fig. 1, or may have a separate form of bearing, as illustrated in Figs. 5 and 6 of the drawings. The bearing shown in Figs. 5 and 6 is composed

of two steel washers *a a'*, each having suitable grooves or recesses for balls or rollers which are interposed, and the washer *a* has a large bore or central opening made to fit a cut-away portion or shoulder formed on the brass bearing *b*. This construction is preferred, because it lessens largely the friction upon the bearing for the end or the axis and provides a non-magnetic contact between the axis and the journal-box. Of course this form of bearing may be used at both ends; but while it is desirable to use brass bearings at both ends it is unnecessary to employ the washers and balls at the end of the axis remote from the worm, for the thrust is in the direction of the worm, and the greatest friction is therefore produced at or near that point. The bearings for this axis are preferably arranged in the top portion of the box composed of two sections D D', at the junction of which are formed bearings for the transverse shaft H, carrying the worm-wheel F and two yokes G G. The yokes have each a straight groove provided with offsets C C', one at each end of the groove, and respectively at the opposite ends of the same. These yokes may be secured to the shaft by a spline and groove or otherwise, and in lieu of two it is obvious that only one may be employed if slight modifications are made. Arranged to slide in the grooves of the yokes are friction-rollers connected to the ends of the pitmen K. At the other ends the pitmen are connected to the sliding cross-head L, in which latter is secured in any suitable manner the tubular tool-holder M. A long and powerful spring is arranged to have bearing at one end against the frame within the extension A' and to project for some distance within the tool-holder and against the shoulder formed in the interior thereof. The pick N may be secured by the usual connection in the recess formed in the head or outer end of the tool-holder, as is shown in Fig. 1; or the pick may be suitably attached to the coupling-piece O, which latter in turn is fixed to the outer end of the tool-holder, all as shown in Fig. 4. The coupling-pieces may be of various lengths, and will thus enable the reach of the machine to be lengthened or shortened, as is desired. The yoke is preferably cut away adjacent to the

ends containing the offsets $c c'$, and pivoted to these parts of the yokes are two levers $d d'$, the long ends of which are curved and point across the offsets across the path of the pitmen. The shorter ends of the levers bear against the spring-actuated followers $e e'$, which are suitably arranged and guided within the yoke. These levers, as arranged, form cushions to take up the jar caused by the impact of the pitmen at the end of their strokes upon the yokes, and while the form shown and described is preferred and in practice is found to be efficient it is obvious that many modifications may be made in the construction of these cushions by any skilled mechanic.

I find it advantageous to mount the machine on wheels and to have the latter adjustable longitudinally in relation to the former, and I have in Fig. 7 shown a convenient and effective arrangement for attaining this end. The axis f of the wheel has a central opening, and is provided at its inner end with a dovetailed flange g , which is free to slide back and forth in a corresponding way, formed in the main frame, said axis is secured to a wheel by a bolt having a nut and a washer at its outer end and a head h at its inner end, such head also being of dovetailed shape and arranged to slide in a similar groove in the frame, the bolt, of course, passing through the opening in the axis. By tightening the nut the wheel can be fixed at any point, and by loosening said nut the wheel may be slid backward and forward to change its position.

While I have described the best mode of which I am at present advised for carrying out my invention it is obvious that many modifications and variations may be made in the arrangement and details shown and described without departing from the spirit of my invention. For instance, in lieu of the worm and worm-wheel bevel or other gearing might be employed. The worm-wheel turns the shaft and this causes the yoke to turn in the same direction and to retract the pitmen, tool-holder, and tool, and continually compress the powerful spring until the yokes have passed a vertical position and are again approaching a horizontal position, at which time the tension of the springs draws the rollers of the pitman out of the recesses or offsets and powerfully thrusts them to the other end of the groove, at which point the shock which otherwise would result is largely lessened by the spring-actuated levers, which act as cushions, as above described. The pick is in this manner powerfully thrust forward to its work. By arranging the spring largely within the tool-holder a longer and yet powerful spring may be utilized, and at the same time the length of the machine kept within bounds.

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

1. In a mining-machine, the combination of an electric motor, a tubular tool-holder con-

nected therewith, and a spring partially inclosed by the tubular tool-holder and interposed between the same and the frame, substantially as and for the purpose set forth.

2. In a mining-machine, the combination of an electric motor, a tubular tool-holder connected therewith, and a spring partially inclosed by such tubular tool-holder, but longer than the same, and having bearings for its respective ends within the tool-holder and against the frame beyond the inner end of such tool-holder, substantially as and for the purpose described.

3. In a mining-machine, the combination of the frame of the same provided with two flanged grooves, the one smaller and below the bottom of the other, a wheel, a slide adapted to the larger groove of the frame, and a bolt having a flanged head adapted to the smaller and deeper groove and passing through the hub of the wheel, whereby the parts are secured together in an adjustable manner, substantially as and for the purpose set forth.

4. In a mining-machine, the combination of an electric motor and gearing driven thereby with one or more yokes connected with the gearing and provided with grooves, one or more pitmen having one end of the same playing in the groove and the outer end secured to the tool-holder, and a spring interposed between the latter and the frame, whereby such tool-holder and tool are alternately thrust forward by the spring and retracted by the grooved yoke, substantially as shown and described.

5. In a mining-machine, the combination of an electric motor, gearing driven thereby, one or more yokes connected to the gearing provided with elongated grooves, with offsets at each end of the same, with one or more pitmen, one end of which plays in the groove and the other end is connected to the tool-holder, and a spring interposed between the latter and the frame, substantially as and for the purpose set forth.

6. In a mining-machine, the combination of an electric motor, gearing driven thereby, yokes connected with such gearing and provided with elongated grooves, and spring-cushions at the ends of such grooves, pitmen one end of which play in such grooves, tool-holders fastened to the other ends of said pitmen, and an interposed spring between the tool-holder and the frame, substantially as and for the purpose specified.

7. In a mining-machine, the combination of an electric motor, gearing driven thereby, yokes connected with gearing and provided with long grooves having notches or offsets at each end, spring-pressed elbow-levers pivoted to the yokes and projecting across the offsets of the grooves and connected to the tool-holder, and a spring interposed between the latter and the frame, substantially as and for the purpose set forth.

8. In a mining-machine, the combination of a field-magnet and a revoluble armature

having a worm upon its shaft, a worm-wheel
arranged upon a transverse shaft, which lat-
ter also carries yokes provided with long
grooves having offsets in their ends, spring-
5 cushions, pitmen playing in the grooves, a
tubular tool-holder connected to the pitmen,
and a long spring interposed between the
frame and the tool-holder and partially in-
closed by the latter, substantially as and for
10 the purpose specified.

9. In a mining-machine, the combination

of an electric motor with a bearing for one
end of its shaft, comprising a brass collar hav-
ing a reduced portion and two steel washers
with interposed balls, one of said washers en- 15
circling the reduced portion of the collar, sub-
stantially as and for the purposes specified.

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