

No 672,613.

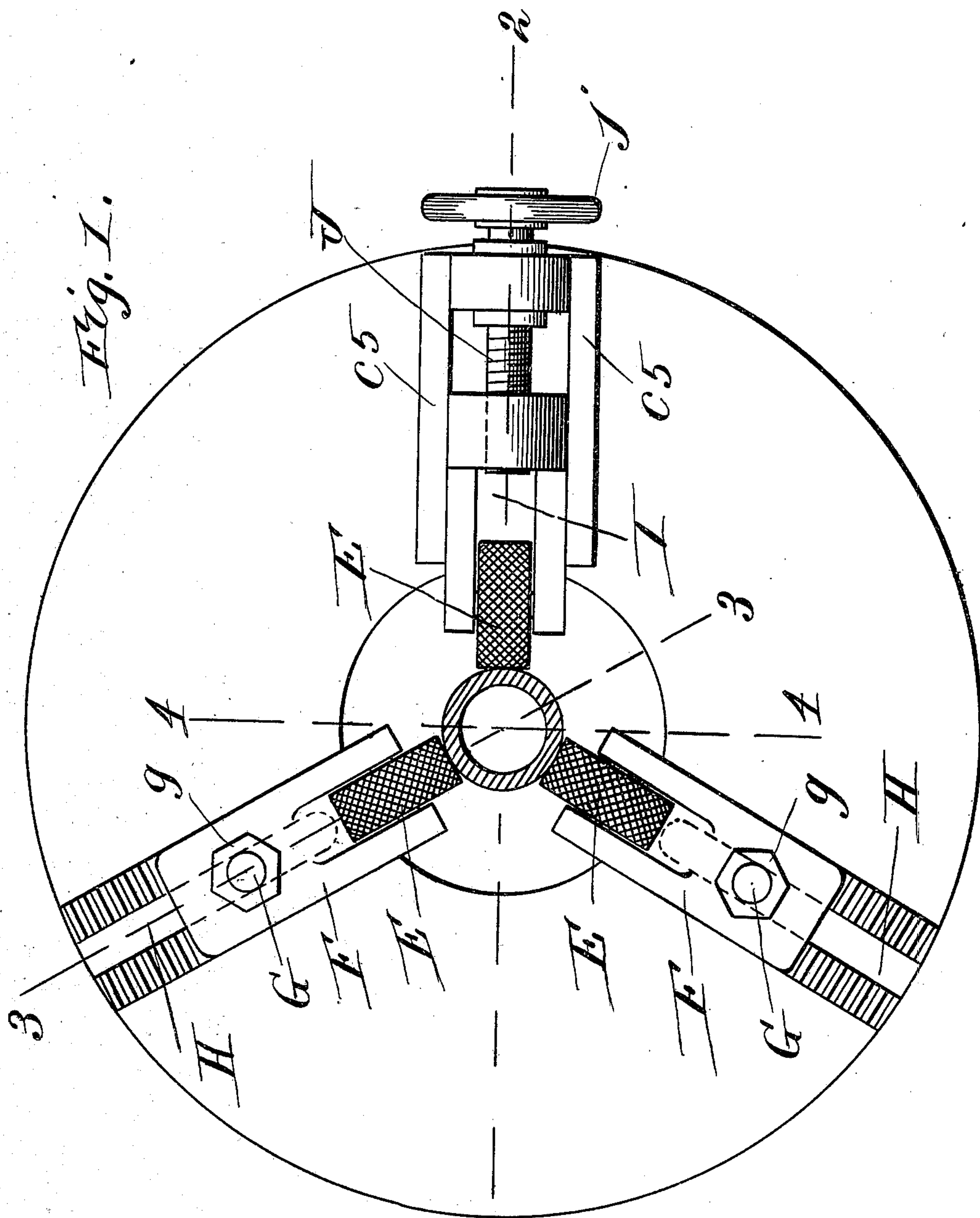
Patented Apr. 23, 1901.

W. H. CATER.
WELL MACHINE.

(No Model.)

(Application filed Feb. 5, 1900.)

3 Sheets—Sheet 1.



Witnesses;
A. F. DuRand
Agnes A. Devine

Inventor;
William H. Cater.
by Chas L Page Atty.

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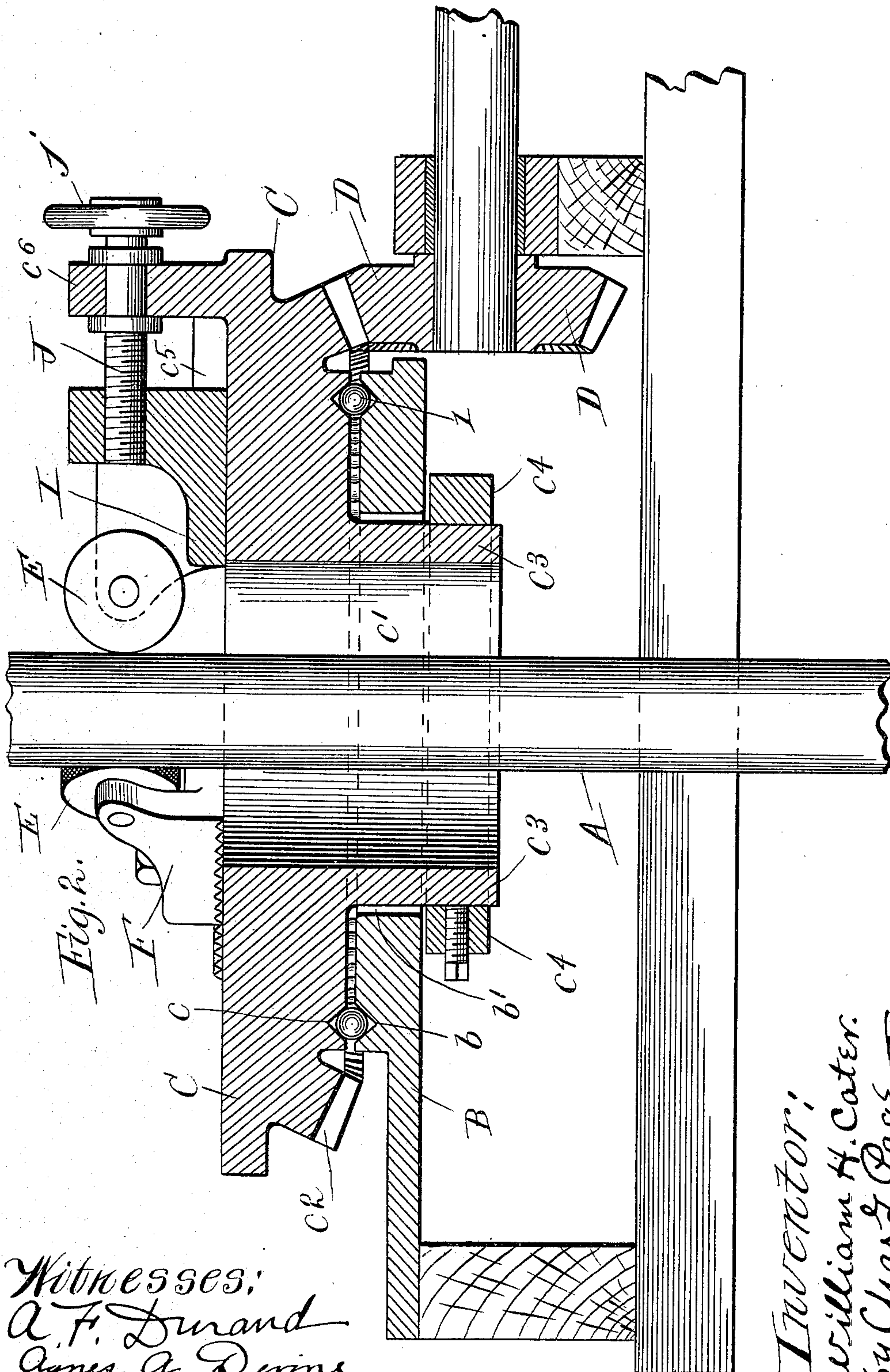
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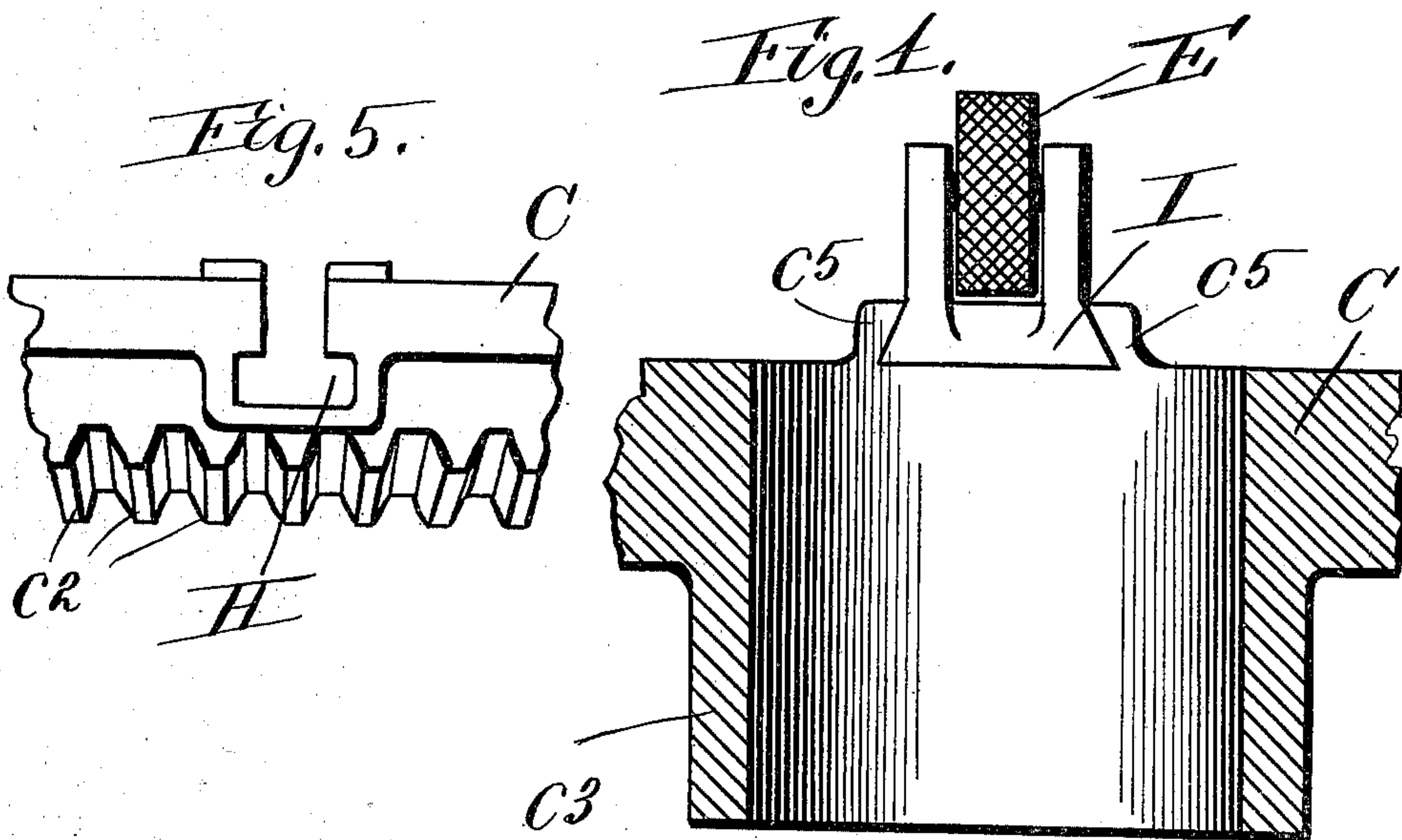
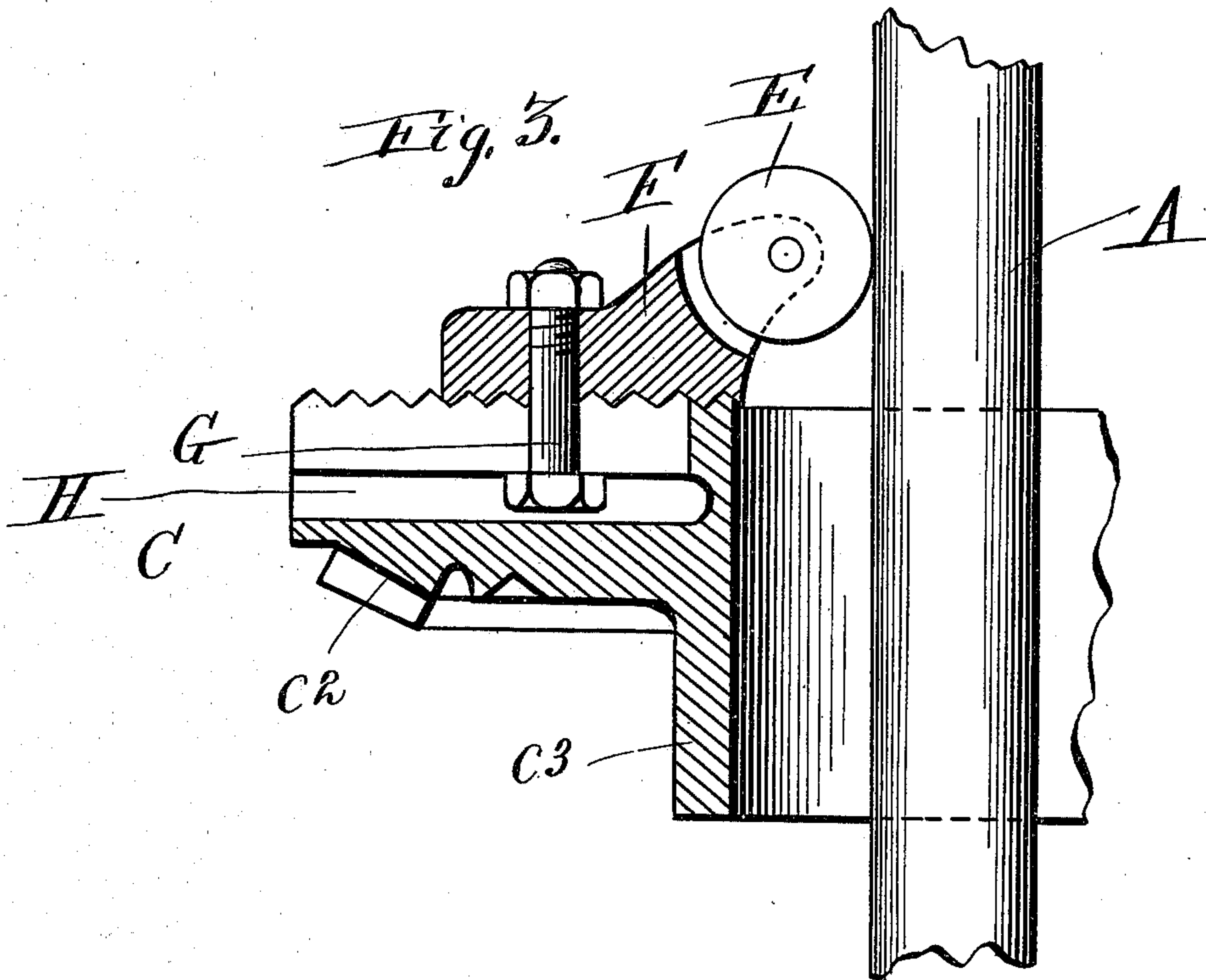
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UNITED STATES PATENT OFFICE.

WILLIAM H. CATER, OF CHICAGO, ILLINOIS, ASSIGNOR TO FREDERICK C. AUSTIN, OF SAME PLACE.

WELL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 672,613, dated April 23, 1901.

Application filed February 5, 1900. Serial No. 4,116. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CATER, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Well-Machines, of which the following is a specification.

My invention relates to that particular portion of a well-machine which grips and rotates the drill rod or pipe and which at the same time permits the latter to have a free longitudinal or end movement.

The objects of my invention are to provide an improved device which will effectively grip and rotate a drill rod or pipe and which will permit the latter to shift longitudinally or feed gradually downward during its rotation, to provide an exceedingly simple and inexpensive device of this character and one which will not be liable to get out of order, to improve the mode of and means for gripping the drill rod or pipe, and to provide certain details tending to increase the general efficiency and to render a device of this character serviceable and thoroughly reliable.

To the attainment of the foregoing and other useful ends my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a plan of a device for gripping and rotating a rod or well-tube embodying the principles of my invention. Fig. 2 is a vertical section on line 2 2 in Fig. 1. Fig. 3 is a vertical section on line 3 3 in Fig. 1. Fig. 4 is a vertical section on line 4 4 in Fig. 1. Fig. 5 is an edge or side view of a portion of the rotary head upon which the gripping-rolls are mounted.

In the foregoing views, A represents the usual drill-rod or well-tube employed in sinking wells and which is for such purpose given a rapid rotation and at the same time allowed to feed gradually downward.

The bed-plate B, upon which the rotary head C revolves, is preferably provided with an annular ball-race *b* and also with a central opening *b'*, and the under side of the rotary head is provided with a similar ball-race *c*, and the antifriction-balls *l* are arranged between the two annular races thus provided.

The rotation of the rotary head C can be accomplished in any suitable manner, but

preferably by providing it with gear-teeth *c*², which are adapted to mesh with the teeth of a bevel-gear D. The head can be provided with a tubular neck or boss *c*³, which extends below the bead-plate and which is provided with a collar *c*⁴. With this arrangement the head C can be rotated at the desired rate of speed by rotating the bevel D, and the collar *c*⁴ will of course prevent the head from rising from its bearings.

The means by which the rotary head is enabled to grip and rotate a rod or pipe comprises a set of gripping-rolls E, which are preferably three in number and arranged about the rod or pipe at equal distances from each other and which are provided with cross-milled or otherwise roughened peripheries, which enable them to firmly bite or grip the tube. These rolls are mounted so as to revolve about horizontal axes and are each preferably mounted and arranged for independent adjustment. As a simple and effective method of obtaining this independent adjustment two of said rolls can be mounted upon blocks F, which have serrations on their under surfaces adapted to engage similar serrations or teeth on the upper surface of the rotary head and which are bolted to the latter by bolts G, the heads of which are arranged to slide in radial slots H, formed in the upper portion of the rotary head C. (See Figs. 1, 3, and 5.) The third roll is preferably mounted upon a block I, having a flaring base which slides in a dovetail groove formed by a couple of beads or ridges *c*⁵. An adjusting-screw J, having a bearing in a lug or boss *c*⁵, is threaded into the tail portion of the block I. Thus all three rolls are mounted for adjustment in directions radial to the rod or tube, and such adjustment permits the use of different-sized rods or tubes and causes the serrated or milled peripheries of the rolls to bite into and grip the said rods or tubes. It will be observed, however, that with this arrangement a rod or tube can either be gripped or released by simply rotating the screw J and that for this reason the rolls mounted upon the blocks F need not be adjusted, except when it is desired to employ either a larger or smaller rod. These rolls which are mounted upon the blocks F can be adjusted by first loosening the nuts g

of the bolts G and by then shifting the blocks to the proper positions and retightening the said nuts. The screw J can be provided with a hand-wheel j or some similar means
 5 for rotating it, and said screw is preferably in line with the axis of the roll E. The adjustment of but one roll is effective in causing the rolls to firmly grip the rod or tube, the inward thrust of the screw J operating to
 10 pinch the rod or tube between the three rolls in fully as effectual a manner as could be obtained by their simultaneous adjustment.

What I claim as my invention is—

1. A well-machine comprising a rotary member provided with a flat top and a central opening, a cylindric drill-rod or well-tube extending through said opening, three gripping-rolls arranged at regular intervals about said rod or tube and provided with peripheries
 20 which bite the same, a block upon which one of said rolls is mounted and which slides in a way formed upon said rotary member, a rotary adjusting-screw engaging a threaded opening in said block and mounted in a bearing on said rotary member, a pair of blocks
 25 upon which the other two rolls are mounted, clamping-bolts extending through said last-mentioned blocks and having their lower end portions arranged to slide in radial slots

formed in said rotary member, and means for rotating the latter, substantially as described. 30

2. A well-machine comprising a rotary member having a flat top and a central opening, a cylindric drill-rod or well-tube extending through said opening, three gripping-rolls arranged at regular intervals about said rod or tube and having flat peripheries which are cross-milled or roughened to enable them to bite or grip said rod or tube, a block upon which one of said rolls is mounted and which
 40 slides in a way formed upon the top of said rotary member, an adjusting-screw engaging a threaded opening in said block and mounted in a bearing on said rotary member, a pair of blocks upon which the other two rolls are
 45 mounted and which have serrated under surfaces engaging serrations or teeth on the upper surface of said rotary member, clamping-bolts extending through said last-mentioned blocks and having their heads arranged to
 50 slide in radial slots formed in said rotary member, and means for rotating the latter, substantially as described.

WILLIAM H. CATER.

Witnesses:

ARTHUR F. DURAND,
 AGNES A. DEVINE.