

(No Model.)

3 Sheets—Sheet 1.

P. MEDART.

APPARATUS FOR TURNING AND POLISHING SHAFTING.

No. 516,543.

Patented Mar. 13, 1894.

Fig. 1.

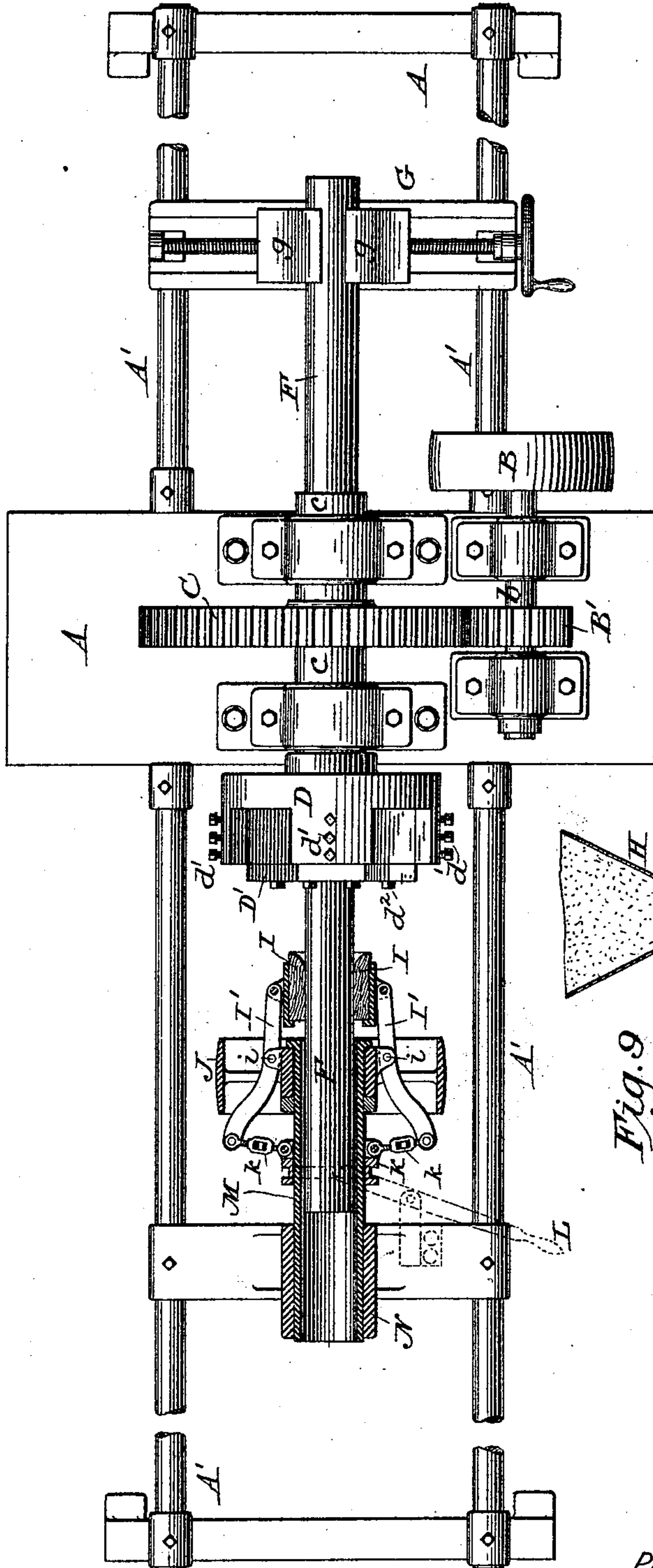
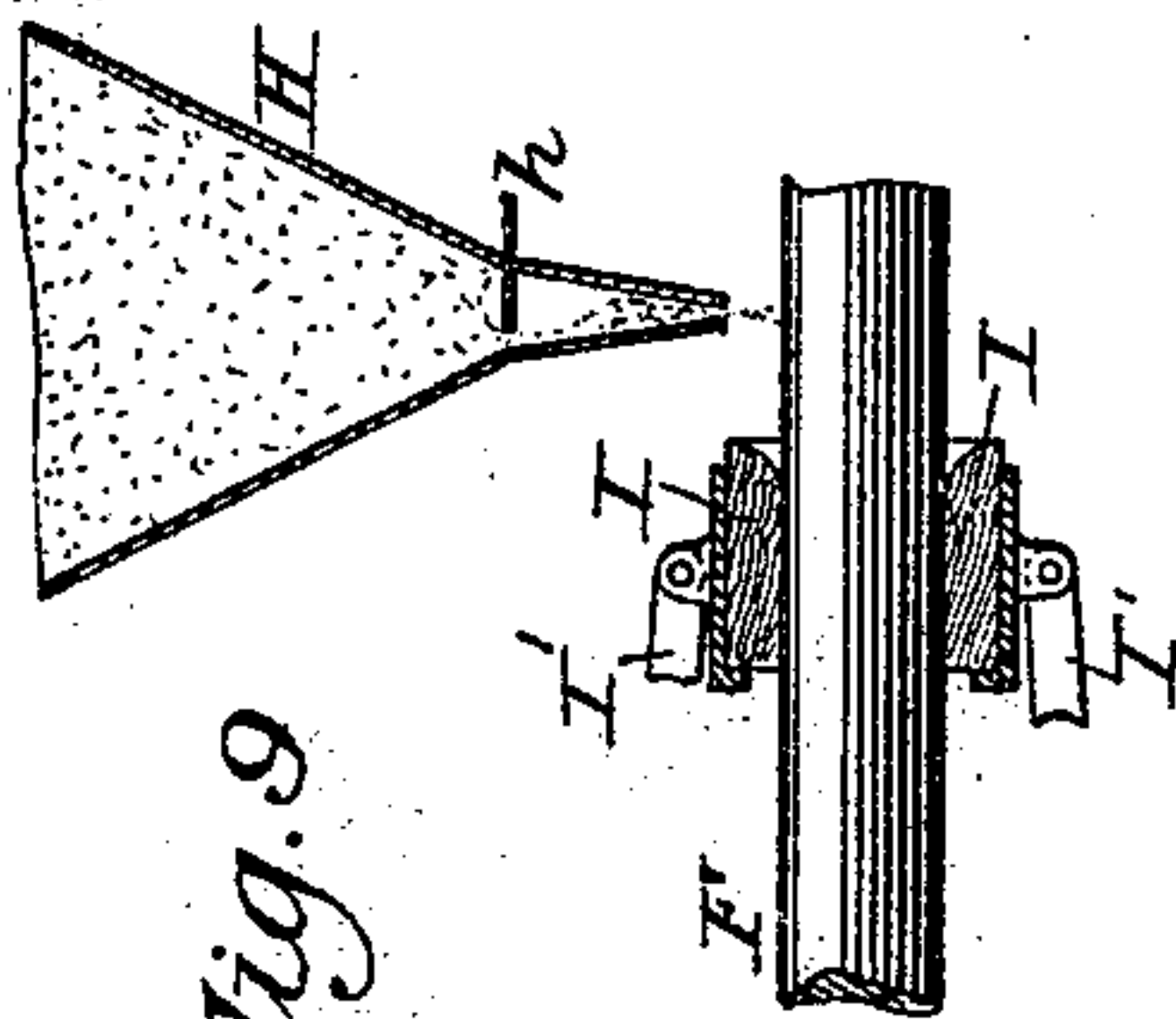


Fig. 9.



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Fig. 3.

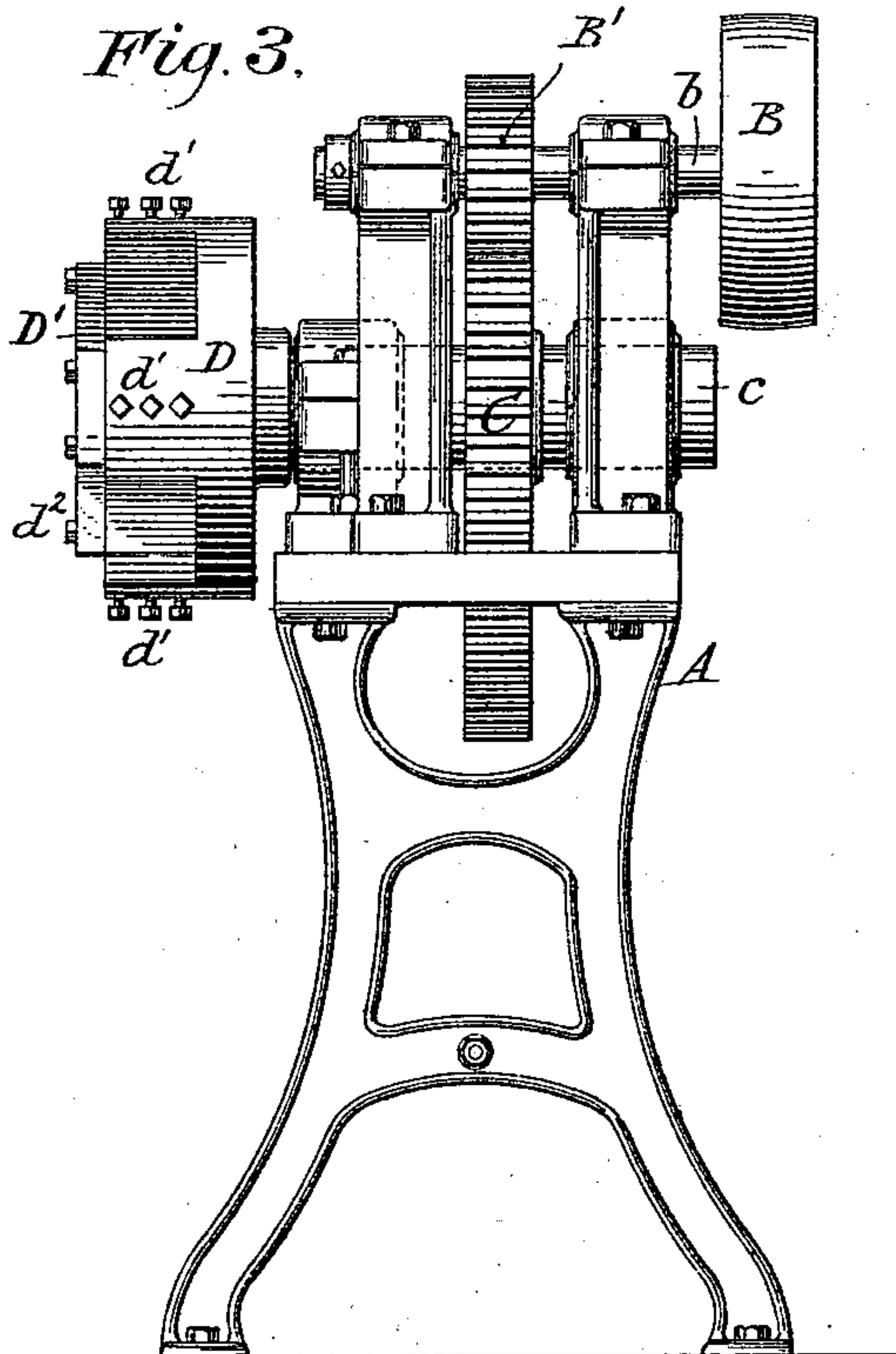


Fig. 2.

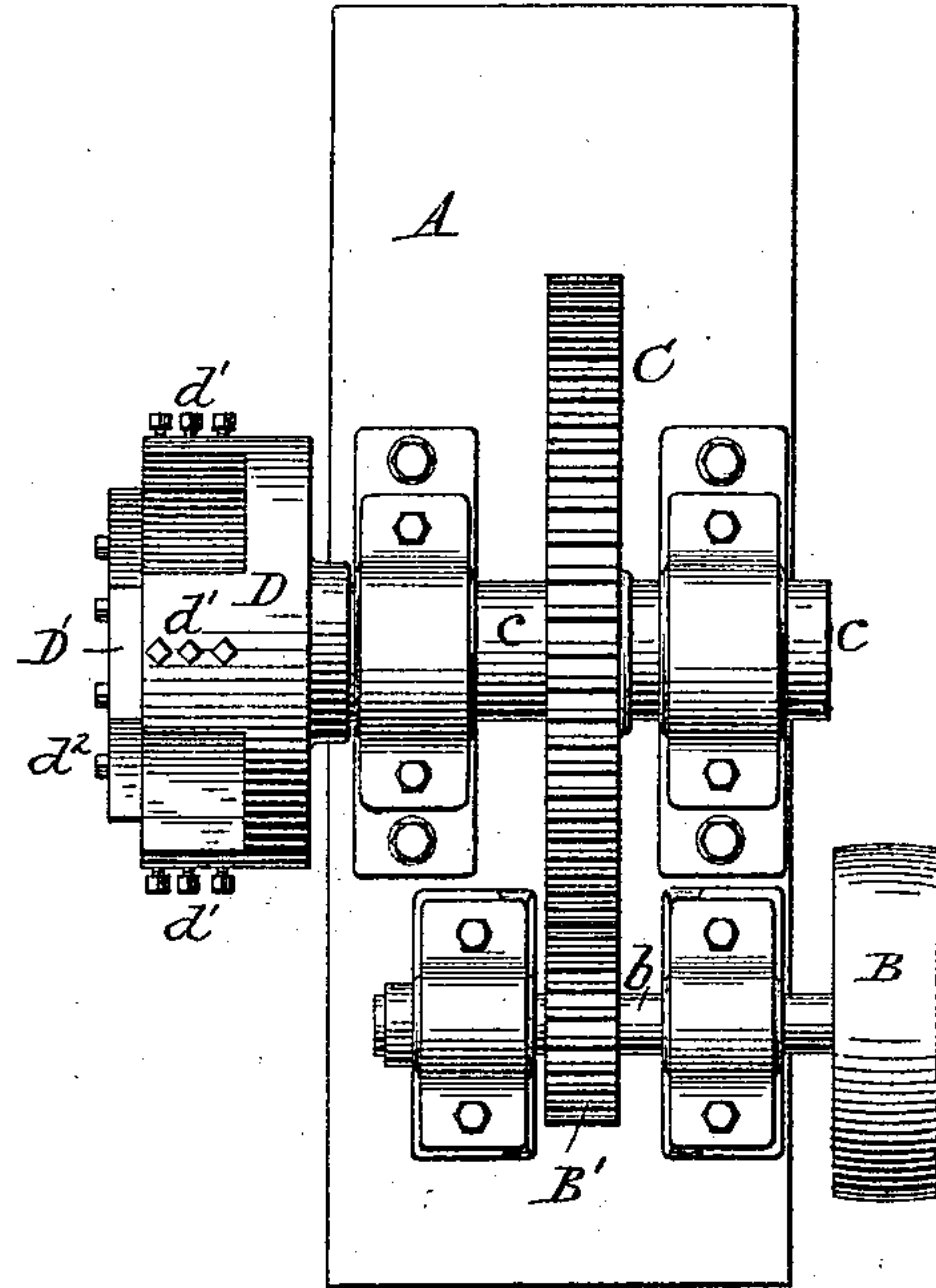
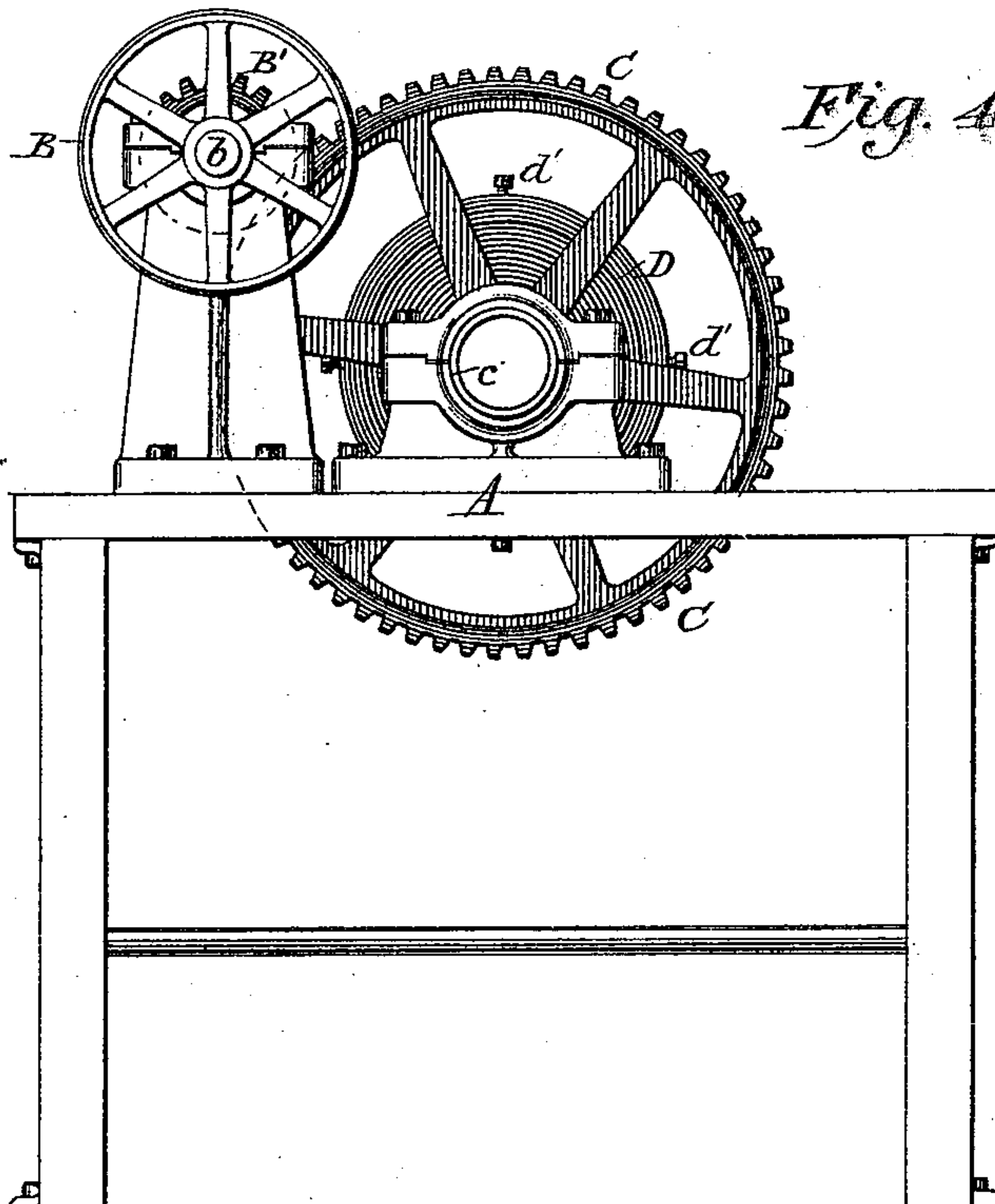


Fig. 4.



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Fig. 5.

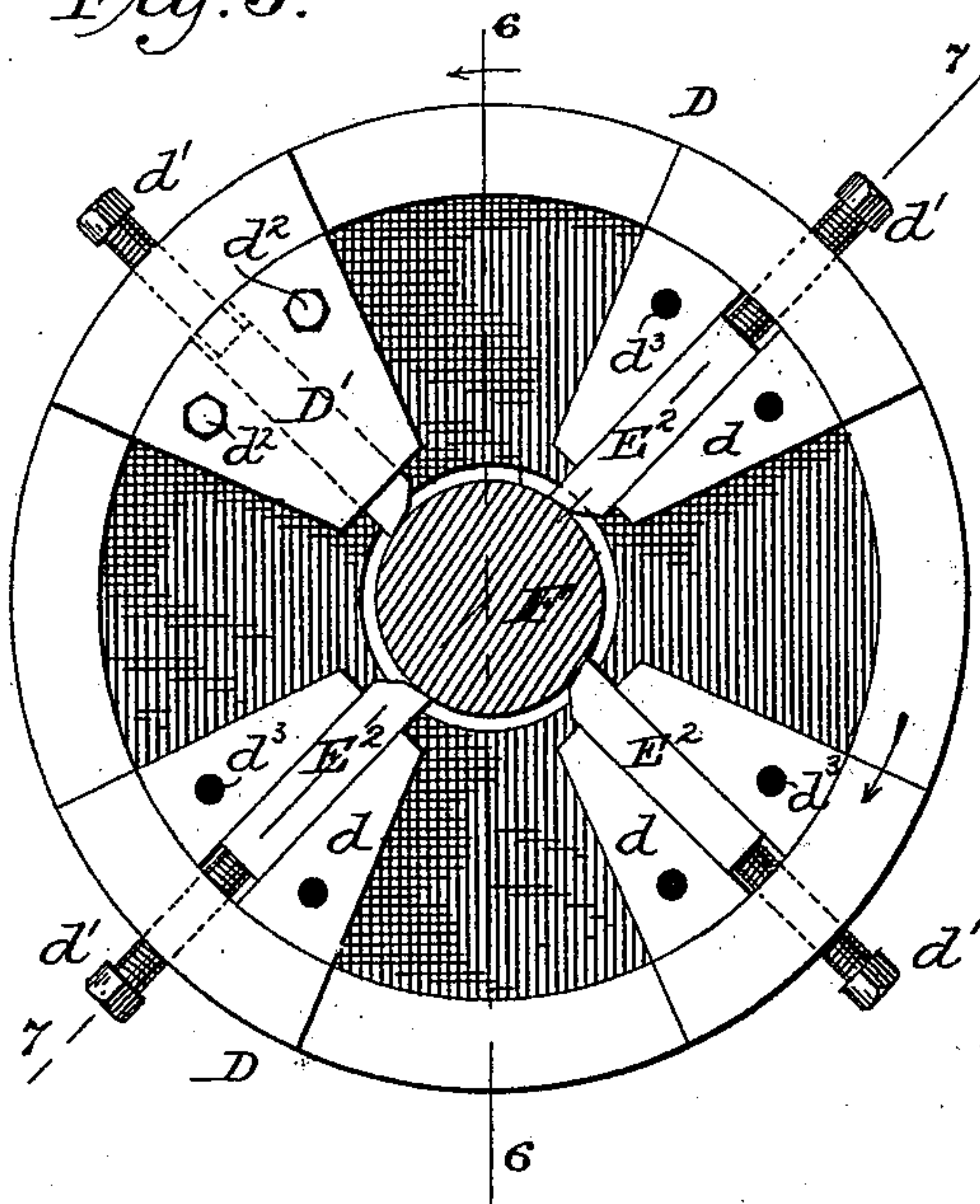


Fig. 6.

ON 6-6

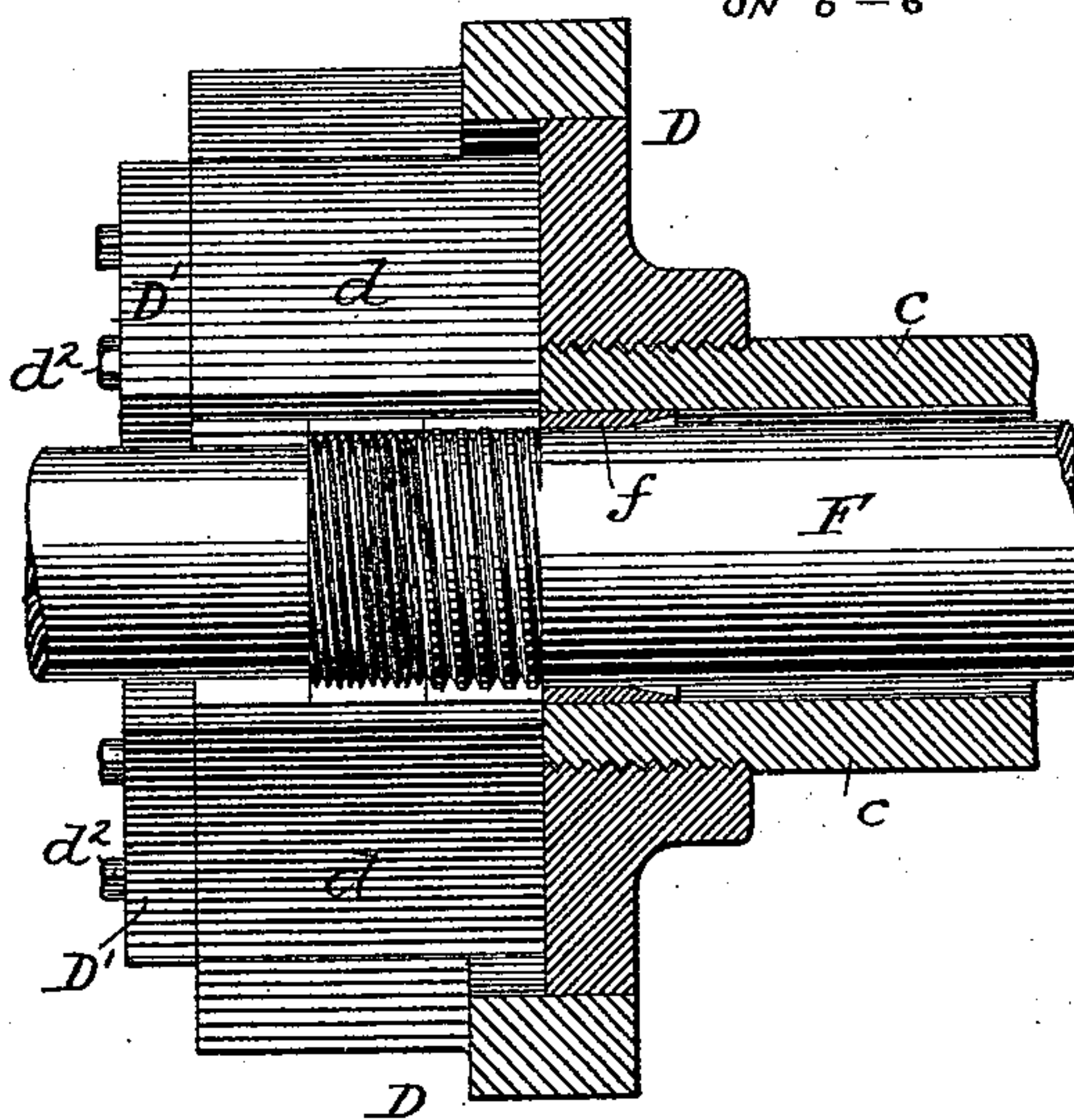


Fig. 7.

ON 7-7

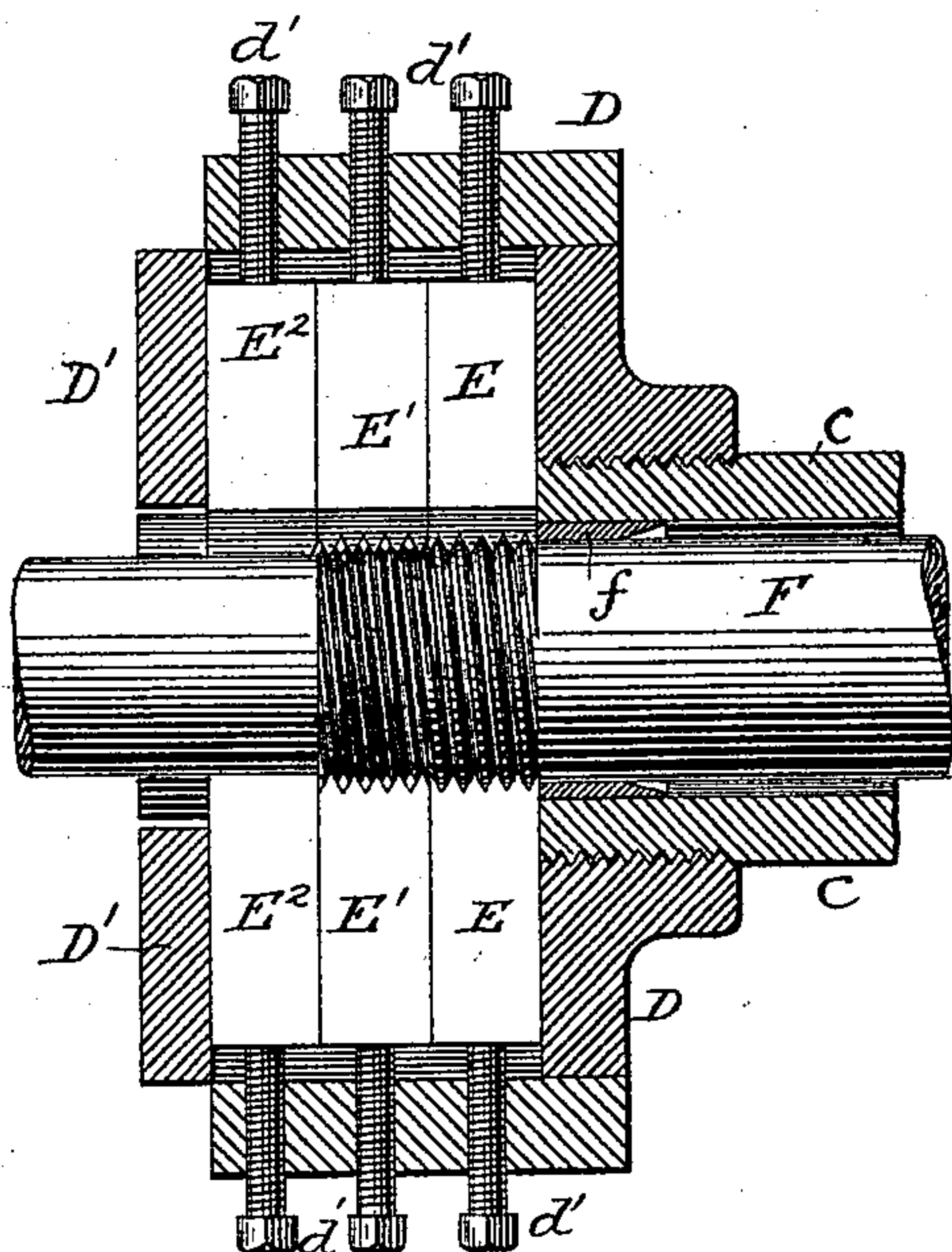
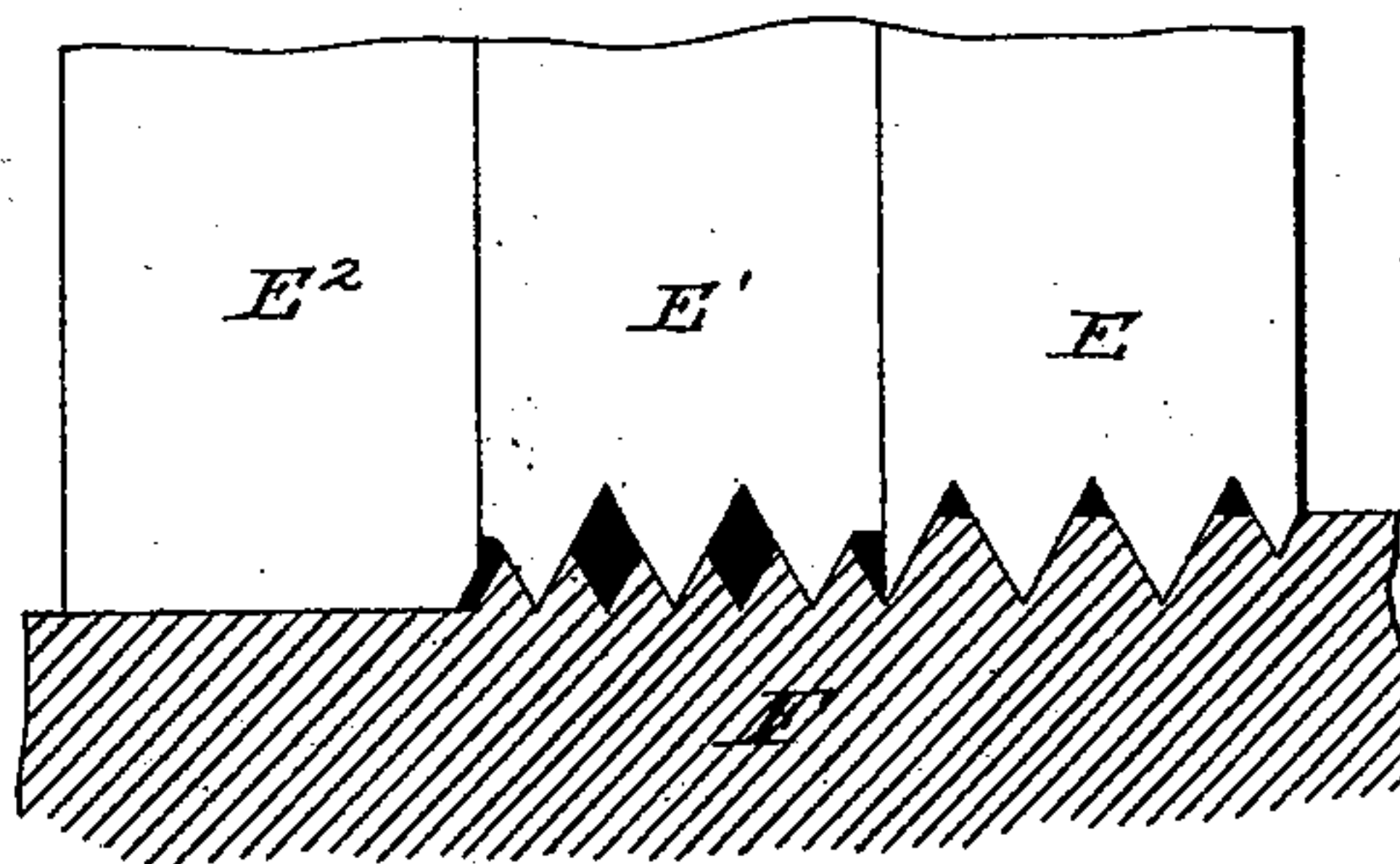


Fig. 8.



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UNITED STATES PATENT OFFICE.

PHILIP MEDART, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
WILLIAM MEDART, OF SAME PLACE.

APPARATUS FOR TURNING AND POLISHING SHAFTING.

SPECIFICATION forming part of Letters Patent No. 516,543, dated March 13, 1894.

Application filed October 4, 1893. Serial No. 487,190. (No model.)

To all whom it may concern:

Be it known that I, PHILIP MEDART, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Apparatus for Turning and Polishing Shafting, of which the following is a specification.

My invention relates to the turning and polishing of round rods or shafting, and its objects are simultaneously to remove the scale and outer coating or surfaces of such shafts, thus reducing them to uniform dimensions, while producing a smooth surface thereon, and to impart a finished appearance to the shafting by polishing its surface. These ends I attain by clamping or supporting the shafting in a suitable bed-plate, and feeding the shaft endwise through revolving chasers and cutters, adjustable radially, relatively to each other and to the shaft in the cutter-head, so as first to form a screw-thread or series of screw-threads on the shaft, by means of one set of chasers, by means of which threads the shaft is fed through the cutter-head, and is simultaneously reduced; then further reducing the diameter of the shaft by cutting off the apices or ridges of the threads formed by the preceding set of chasers or cutters, and then turning down the shaft to the required dimensions by a cutter or cutters, from which the shafting passes directly to suitable polishers, which finish it. The chasers are preferably made with two or more threads, so as to secure rapidity of action, without undue increase of driving power, or heating of the cutting tools. The threads or teeth on the chasers are preferably arranged at such an angle or pitch as to cut two or more parallel threads on the shaft. The object of this arrangement is to form quick screw-threads on the shaft to give it a quick longitudinal movement, at the same time having the threads close together so as to reduce the shaft without leaving uncut spaces between the threads.

I may employ any desired number of chasers and cutters in each set. I preferably employ two sets of chasers and one set of cutters, as the second set of chasers may be arranged to cut off the apices or ridges of the threads formed by the first set of chasers, as above described.

The subject-matter claimed is hereinafter specified.

The accompanying drawings represent so much only of apparatus adapted for carrying out my invention in the best way now known to me, as is necessary to illustrate the subject-matter claimed. Unless otherwise indicated, the parts are of usual well-known construction.

Arrows indicate the direction of movement of some of the moving parts.

Figure 1 represents a plan or top view of the apparatus, with the polishing mechanism in horizontal section; Fig. 2, a corresponding view of the cutter-head and its actuating gearing; Fig. 3, an end view, and Fig. 4, a side view thereof. Figs. 5 to 8, both inclusive, show detail views of the cutter-head, and tools on an enlarged scale, Fig. 5 being a side view; Fig. 6, a longitudinal section therethrough, on the line 6—6 of the preceding figure; Fig. 7, a corresponding section, on the line 7—7 of Fig. 5, and Fig. 8, a longitudinal, sectional diagram, illustrating the method of cutting; and Fig. 9 represents a vertical, longitudinal section through the polishing apparatus.

The mechanism is shown as mounted on a main frame A, A'. A band-wheel B, driven from any suitable prime-mover, actuates a driving-shaft b, carrying a gear-wheel B', engaging a similar wheel, C, on a tubular shaft c, mounted in suitable bearings on the main frame, and carrying a cutter-head D, secured thereto by a screw or other suitable detachable connection. The drawings show this cutter-head as provided with a set of four radial chasers E, and an adjacent set of four radial chasers E', and also with a set of cutters E², all of which are arranged equidistantly around the head, and separately adjustable radially relatively to each other therein, sliding endwise in blocks d, carried by the head D. The chasers and cutters are controlled by suitable set-screws d'. The blocks d, are provided with suitable recesses to hold the cutters in position and permit of their adjustment, the outer ends of the recesses being closed by plates D', secured by bolts d², to the blocks d, which are provided with holes d³, to receive the bolts.

I find the use of four or more sets of cutters

and chasers most efficient, as the strain thereon and constant wear thereof are rendered much less than would be the case with a smaller number. By making those of each set separately adjustable, I am enabled to readily remove or replace worn or broken parts, without removing or regrinding the entire tool. I am also enabled to separately vary the adjustment of the tools in each set or group relatively to each other and to the shaft. It will be observed by reference to Fig. 8, that the outer edges of the teeth in both adjacent chasers E E' in each set or group are in the same horizontal plane and each chaser cuts to the same depth, the chaser E' cutting grooves in the threads formed by the chaser E, thus dividing the threads formed by the chaser E into two threads of one-fourth the size, one-half of the body of the thread being removed. By this arrangement, the tools are given an equal amount of work to do, and the cutter E² has a uniform resistance to overcome. The wear of all the tools is thus made more uniform.

The shafting F, to be finished, is held by suitable clamps g, in a bed-plate G, sliding on suitable ways A', on the main frame. This clamp holds the rear end of the shafting; the front end, after passing through the cutters, passes through a suitable holding device hereinafter described. A removable bushing f, intermediate of the shafting, and the tubular support c, of the cutter-head, holds the shafting in accurate alignment. The bushing is provided with a flaring mouth, to facilitate the insertion and centering of the shaft, and differences between the shafting and cutter-head may be compensated by varying the thickness of the bushing, thus accommodating shafting of different diameters. The end of the shafting is first fed into the opening in the cutter-head by hand. The first set of chasers E, cuts threads thereon, and thereafter automatically feeds the shaft longitudinally, without revolving it, by means of such threads. This first set of chasers is intended mainly to remove the outer scale from the shaft and form the screw-threads thereon. I prefer to cut two or more threads simultaneously on the shaft, as the feed is thus rendered more rapid, with less corresponding increase of power and of heating action than would result from cutting a single thread at the same rate of feed. This is effected by arranging the teeth or threads in the chasers E, at a suitable pitch to form parallel screw-threads on the shaft. In this way the desired speed of longitudinal movement is given to the shaft, while the surface is uniformly reduced without leaving uncut spaces between the threads. As will be observed, by reference to Fig. 8, the chasers are so arranged as to cut the threads in such manner that their edges shall be blunt instead of sharp. The second set of chasers E', is so organized as to diminish the diameter of the shaft by cut-

ting away the apices or ridges of the screw-threads formed by the first set of chasers, but not to cut below the bottoms of the grooves first formed—see Fig. 8. This mode of cutting diminishes the power required to do the cutting, and aids in securing rapid and effective work. The cutter E², finally reduces the shafting to the desired diameter by cutting away the screw-threads left by the preceding chaser. The arrangement by which the second set of chasers is made to operate upon the threads cut by the chasers E', is shown in Fig. 8. It will be observed that the distance between the first tooth in the chaser E', and the last tooth in the chaser E, is approximately one-half the distance between the apices of the teeth in the chaser E. As before remarked, more than two sets of chasers, and more than one set of cutters may be employed in heavy work if desired, and the independent adjustment of the cutters and chasers in the cutter-head facilitates their adjustment relatively to each other and to the axis of rotation of the shafting. As the shafting leaves the cutters, some of the oil used in lubricating it during the cutting operation adheres to it, and enables it more readily to retain an abrading or polishing material, such as emery, fed upon it from a suitable hopper, H, provided with a feed-valve h. The polisher is shown as consisting of rubbers I, of wood or other suitable material, mounted on levers I', rocking on pivots i, on a pulley J, driven by suitable means, and revolving on a sleeve M, secured in a bracket N, on the frame. The finished rod or shafting passes through and is supported by this sleeve. The rocking levers I', are connected by adjustable links k, to a slide ring K, on the sleeve M, and actuated by a hand-lever L, to vary the pressure of the rubbers on the shaft.

By my improved apparatus, shafting is turned to give it a uniform symmetrical surface at a minimum expenditure of power, and is by the act of turning fed forward and delivered to polishers which automatically give to it a finished appearance.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of a cutter-head, a chaser therein adapted to form screw threads on the shafting and to feed it thereby, a second chaser with its teeth set to cut grooves in the apices or ridges of the screw threads thus formed, and a separate cutter adapted to remove the screw threads to reduce the shaft to the diameter desired, and means for adjusting the chasers independently relatively to each other and to the shaft.

2. The combination, substantially as hereinbefore set forth, in a machine for turning shafting, of a cutter-head, a chaser therein having teeth adapted to form screw-threads on the shaft, and to thereby feed it through the cutter-head, a second separate chaser with its teeth set to cut grooves in the apices or

ridges of the screw-threads thus formed, and a cutter-head adapted to remove the resulting screw-threads.

3. The combination, substantially as here-
 5 inbefore set forth, of a tubular cutter-head,
 a chaser therein with teeth set to form screw-
 threads on the shafting and to feed it thereby,
 a second separate chaser with its teeth set to
 form in the apices or ridges of the screw-
 10 threads first formed grooves of the same depth
 as those formed by the teeth in the first
 chaser, and thereby double the number of
 threads, and a cutter for removing resulting
 screw-threads.

4. The combination, substantially as here-
 15 inbefore set forth, of a tubular cutter head,
 a set of separate chasers therein, with the
 threads arranged at a pitch or inclination to
 form two or more parallel quick screw threads
 20 on the shaft, and feed it thereby, a set of cut-
 ters to remove the screw threads, and means
 for adjusting the chasers and cutters sepa-
 rately or independently in the head relatively
 to each other and to the shaft.

5. The combination, substantially as here-
 25 inbefore set forth, of the main frame, a tubu-
 lar shaft mounted in suitable bearings on the
 main frame, a cutter-head secured to said
 tubular shaft, a series of blocks mounted in
 the cutter-head, radially adjustable chasers
 30 and cutters mounted in said blocks, a bushing
 (f) within the tubular shafting, and an end-
 wise moving clamp for supporting one end of
 the shaft to be reduced as it passes through
 35 the cutter-head.

6. The combination, substantially as here-

inbefore set forth, of a main frame, a cutter
 head mounted therein, separate chasers and
 cutters carried thereby, means for adjusting
 the chasers and cutters relatively to each
 40 other and to the shaft, a transverse clamping
 frame in which the shafting is secured, and
 polishing mechanism, the organization being
 such that the shaft is fed through the cutter
 and polisher by means of the screw threads
 45 cut on the shaft by the chasers and subse-
 quently removed before polishing.

7. The combination, substantially as here-
 inbefore set forth, of the main frame; the cut-
 ter-head; the clamping frame carrying the
 50 shafting to be finished; the tubular sleeve on
 the opposite side of the cutter-head, and the
 polishing mechanism mounted on the tubular
 sleeve, the organization being such that the
 shafting is supported by the tubular sleeve,
 55 while being polished and fed therethrough by
 means of the screw-threads formed upon the
 shaft, but cut away before polishing.

8. The combination, substantially as here-
 inbefore set forth, of a rotating cutter-head,
 60 provided with chasers and cutters; a hopper
 containing abrading or polishing material,
 and a polisher, the organization being such
 that the rod or shafting is fed through the
 polisher by the screw-threads formed thereon
 65 in passing through the cutter-head.

In testimony whereof I have hereunto sub-
 scribed my name.

PHILIP MEDART.

Witnesses:

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 LLOYD B. WIGHT.