

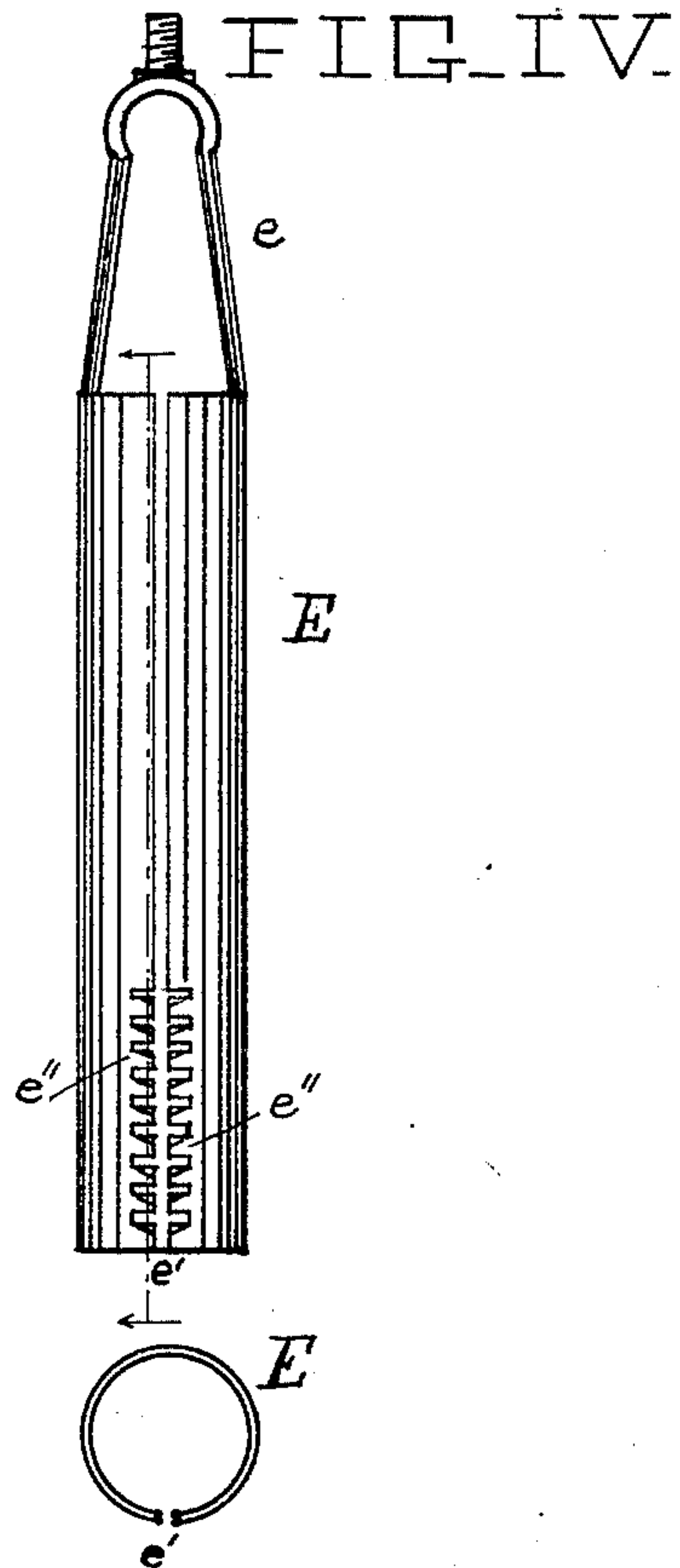
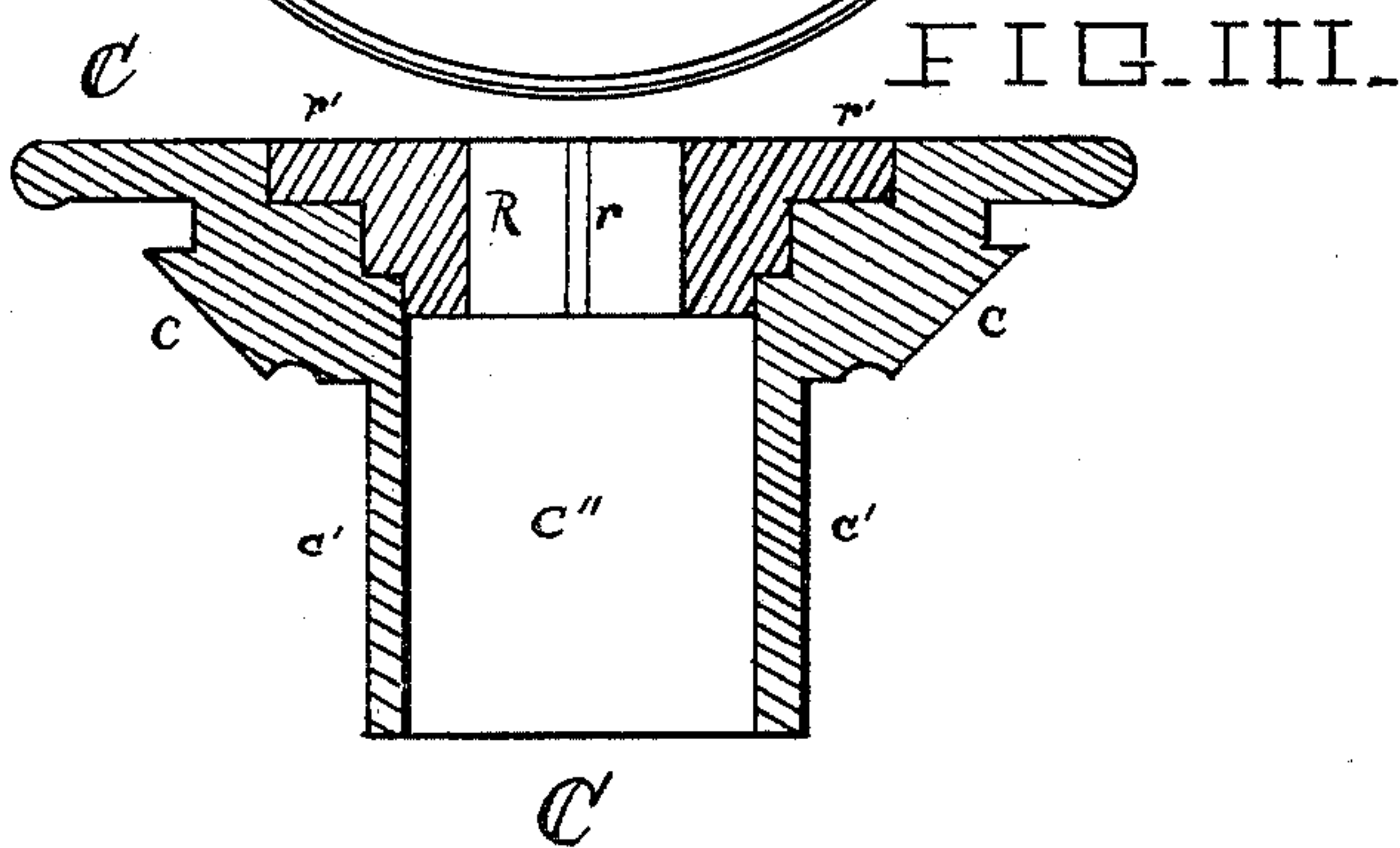
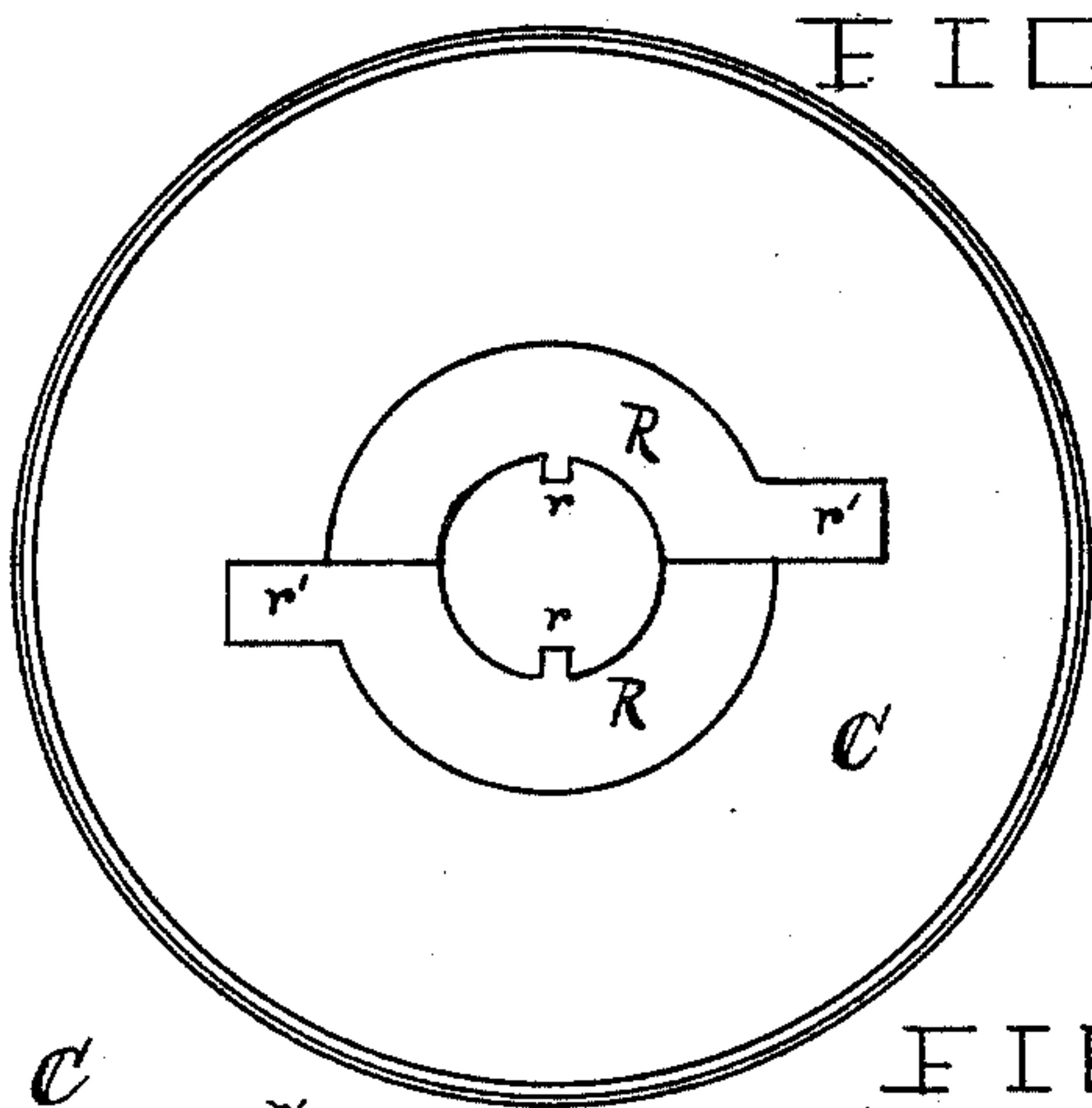
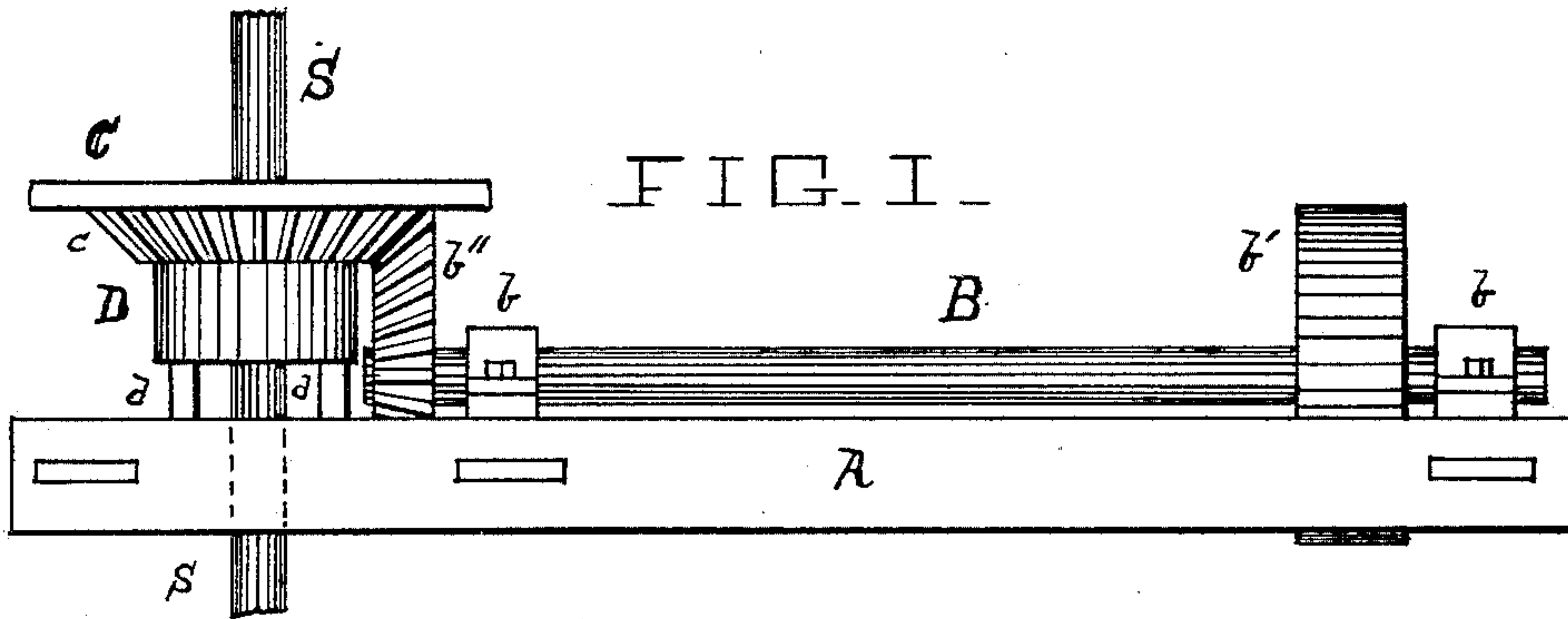
(No Model.)

2 Sheets—Sheet 1.

M. BEAL.  
CORE DRILLING MACHINERY.

No. 450,656.

Patented Apr. 21, 1891.



Witnesses.  
*Lelia Boynton.*  
*J. L. Finner.*

Inventor.  
*Moses Beal*  
*by H. L. Fay his atty.*

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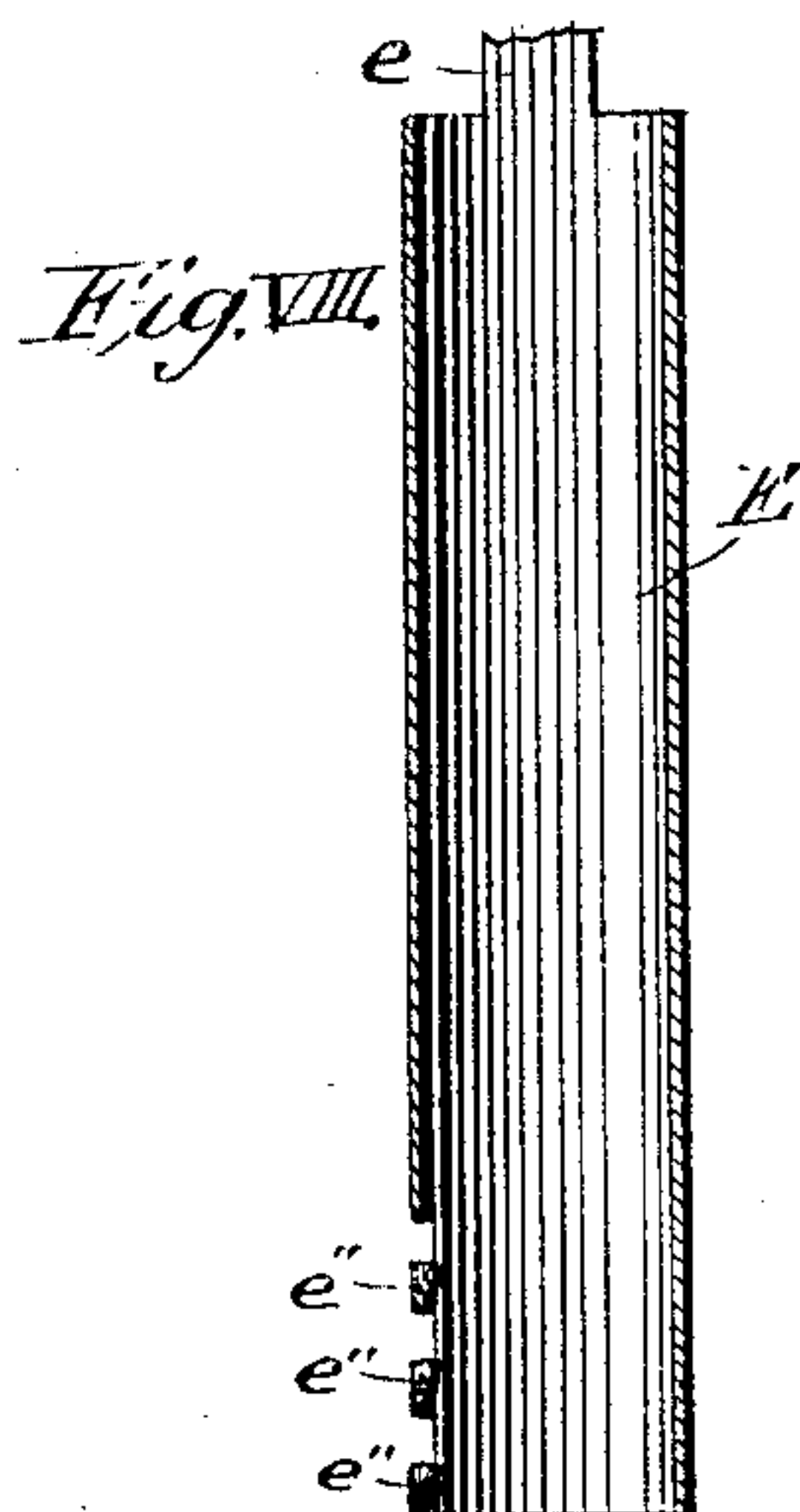
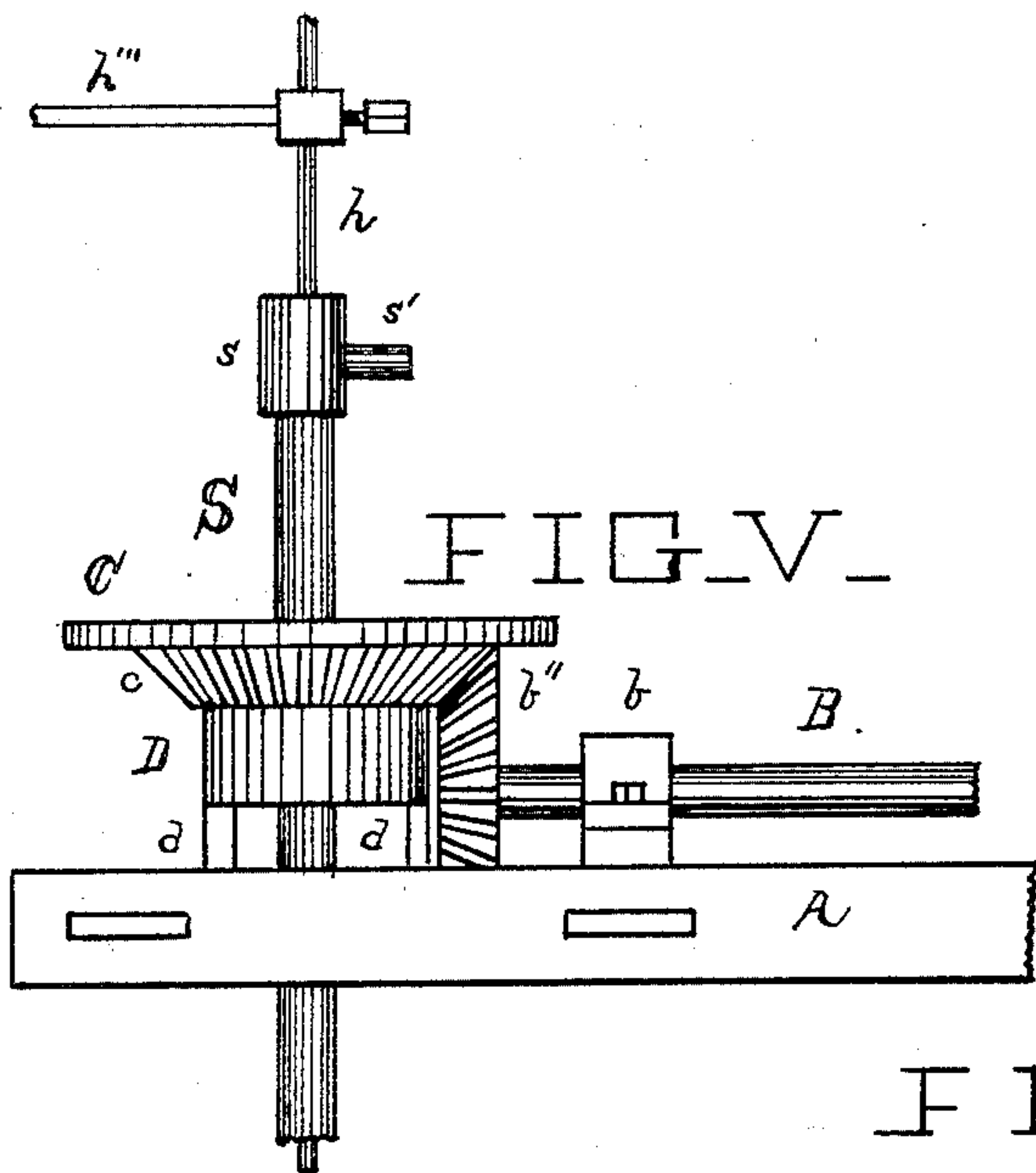


FIG. VI.

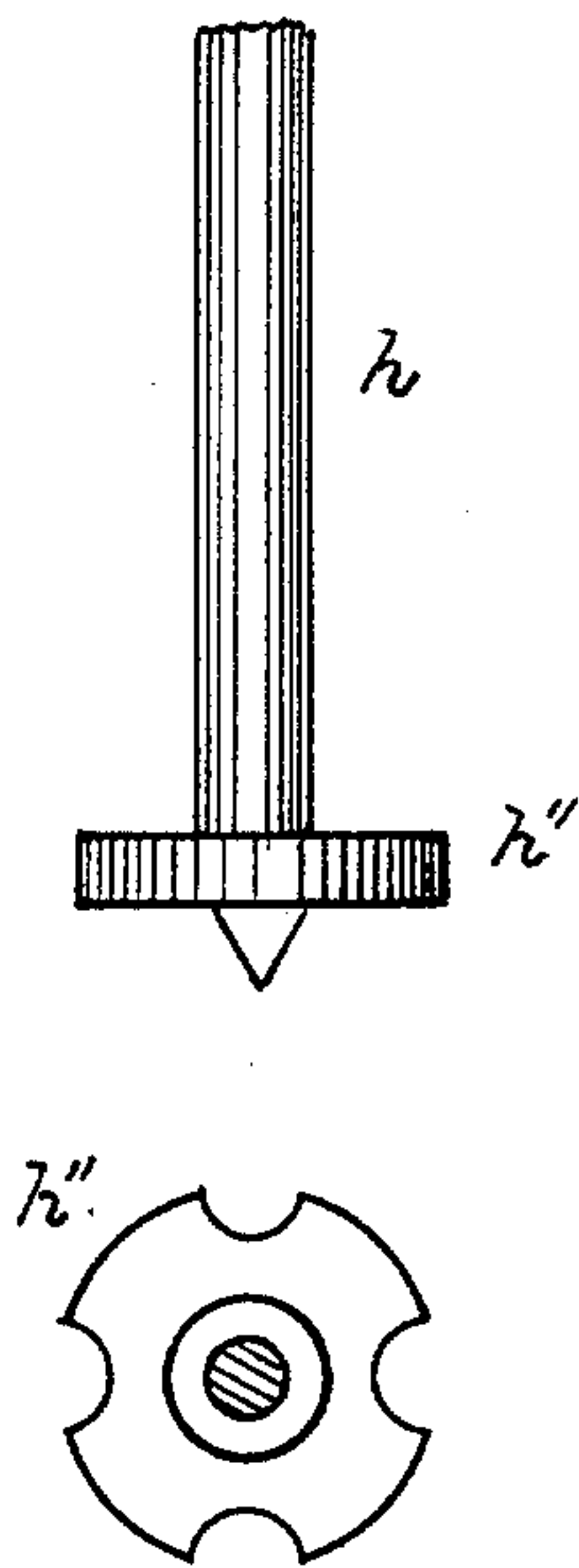
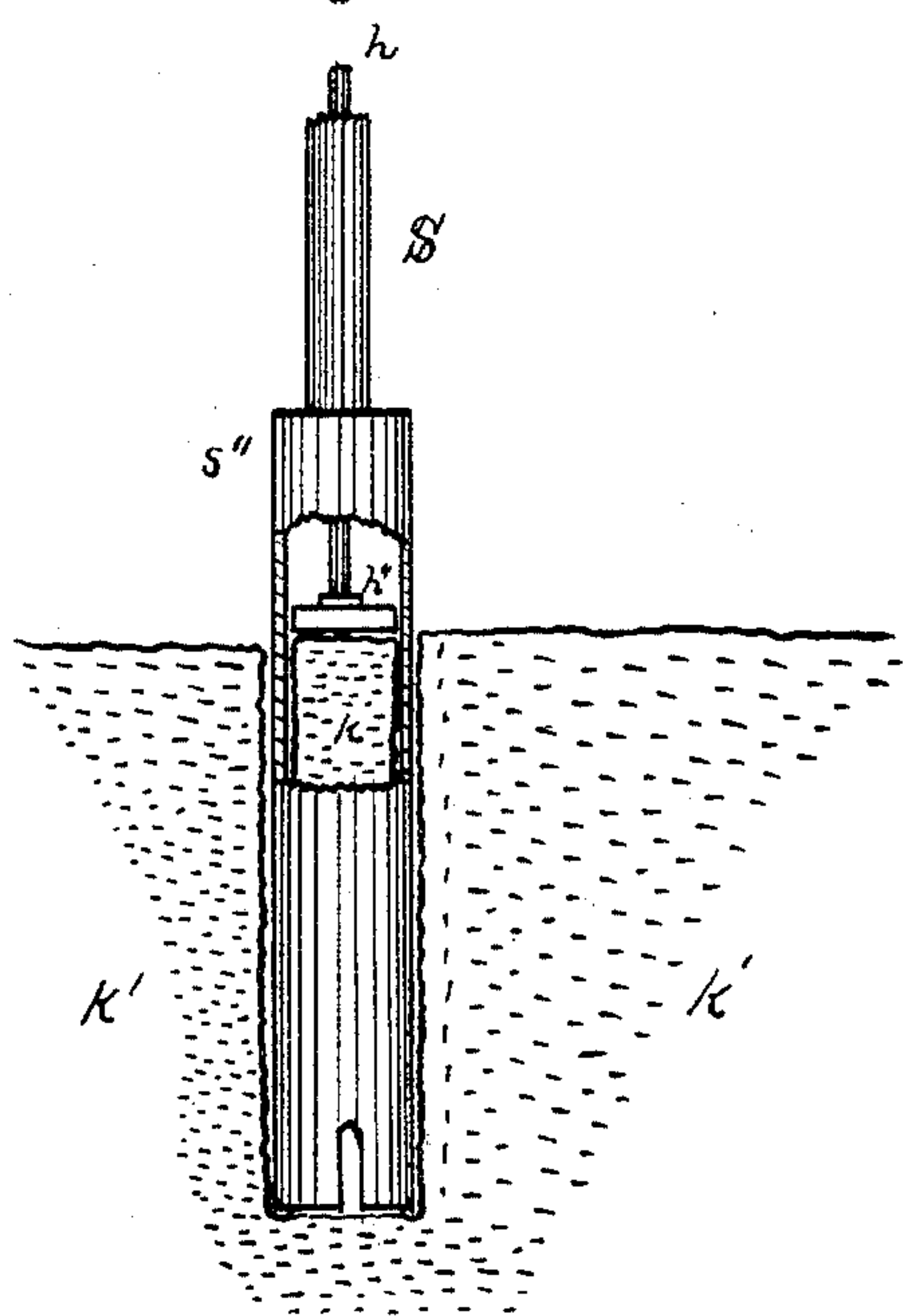
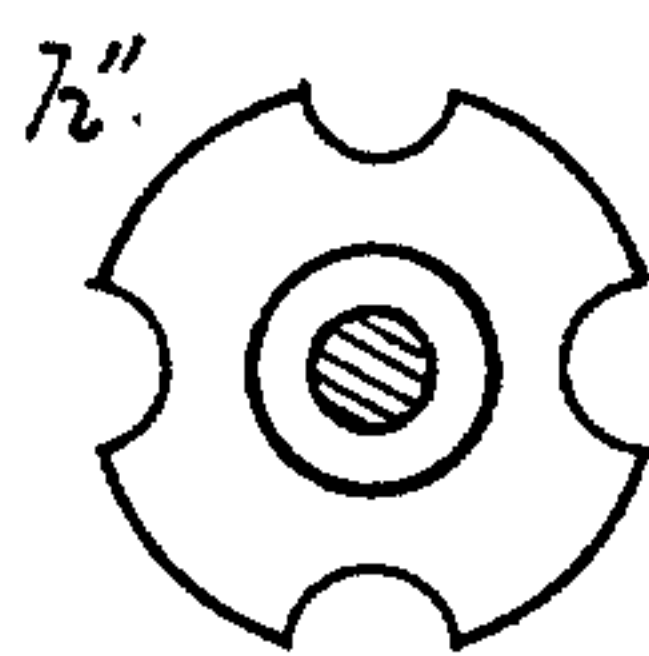
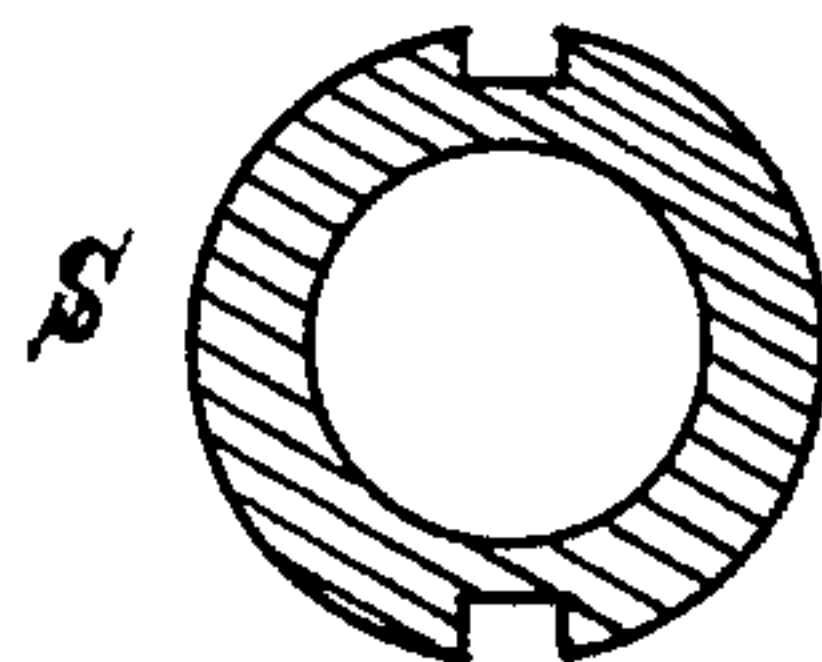


FIG. VII.



Witnesses.

Lelia Boynton.  
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Moses Beal  
by W. L. Fay his Atty.



# UNITED STATES PATENT OFFICE.

MOSES BEAL, OF ELYRIA, OHIO.

## CORE-DRILLING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 450,656, dated April 21, 1891.

Application filed June 21, 1890. Serial No. 356,294. (No model.)

*To all whom it may concern:*

Be it known that I, MOSES BEAL, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have  
5 invented new and useful Core-Drilling Machinery, of which the following is a specification.

My invention relates to improvements in drilling machinery for producing specimens  
10 of the different strata underlying the surface of the earth in the form of cores of cylindrical form which may be extracted, inspected, and preserved as desired.

The object of my invention is to provide  
15 such drilling machinery as can be easily and effectually operated, be simple in construction and durable, and produce longer and larger cores than ordinarily obtained, showing all seams and irregularities in the strata drilled  
20 through. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which—

Figure I is a side elevation of my rotating mechanism. Fig. II is a top view of rotating  
25 wheel. Fig. III is a longitudinal sectional view of Fig. II. Fig. IV is side and end elevation of my core-extractor. Fig. V shows a sectional view of my core-holder when in use. Fig. VI shows an enlarged view of the lower  
30 end of my core-holder and an end elevation of same. Fig. VII represents a cross-section of the drill-stem. Fig. VIII represents an enlarged sectional view of my core-extractor, showing in detail the form and construction  
35 of the teeth of same.

Similar letters refer to similar parts throughout the several views.

A represents a frame for said machine.

B represents any suitable driving-shaft  
40 which runs in the boxes *b b*, to which is attached the driving-pulley *b'* and the bevel gear-wheel *b''*.

C represents the rotating wheel, which is provided with bevel-gear *c*. The lower end  
45 of this wheel is provided with an arbor *c'*, which runs or turns in the thimble or casing D, which casing or thimble is attached to and supported on the main frame A by the cross-bars or supports *d d*. Through the center of  
50 the rotating wheel is a circular perpendicular opening *C''* sufficiently large to admit of the free passage of any desired drill. The upper

end of said opening is enlarged or recessed out in proper shape to receive the semicircular contracting rings R R, which are made  
55 alike and so constructed that when joined together the central hole through same will be of such diameter as to loosely fit the drill-stem S, and the outside of said rings will fit the enlarged opening or recessed part of the  
60 drill-wheel C. Each of these semicircular rings is provided with perpendicular lugs *r*, which fit in corresponding grooves in the drill-stem and by which the same is rotated.

The outside of each of the contracting rings  
65 is provided with an arm or lug *r' r'*, which is so constructed as to fit into a recess in the top of the rotating wheel C and prevents the rings R R turning in the rotating wheel when the  
70 same is rotated.

E represents a core-extractor, which is nearly the size of the drill used, and consequently will pass through the opening *c''* of the rotating wheel. The upper end is provided with a handle *e*, provided with a screw on the end,  
75 to which may be attached a rod for lowering same into the hole drilled. This extractor is made of sheet metal rolled up into tubular shape of proper size, with a narrow opening  
80 *e'* left its entire length. Near the lower end are cut for any desired distance along this opening teeth *e''*, the upper edges of which are twisted or bent inward. The teeth may be of the form shown in the drawings, or any  
85 other in which the upper ends are turned or bent inward.

The drill-stem S is hollow or tubular its entire length. To the upper end is attached a packing-box *s*, which is provided with an inlet-pipe *s'* for the purpose of introducing or  
90 forcing water down through the drill-stem and drill to the lower end of the drill.

*s''* represents the drill with part of one side cut away, which drill is of the ordinary form of core-drills.  
95

*h* represents my core-holder in broken sections, and consists of a long rod, the upper end of which passes through the packing or stuffing box *s*, the lower end of which is pointed and provided with a wheel *h''* circular in form and of right size to fit the inside  
100 of the drill. This wheel may be perforated with holes or have sections cut out of its edges to allow of the free passage of water.



To the upper end of the rod *h* is attached a clamp and arm *h'''*, to prevent said rod from turning when drill-stem is rotated.

K represents the core in the drill, and K' the rock or strata in which same is operated.

The operation of my invention is as follows, to wit: When it is desired to drill a hole for a core, after the machine is in proper position the rings R R are removed from the rotating wheel. The drill is passed through the opening, and the drill-stem S and core-holder *h* are attached, when the rings R R are placed in position in the rotating wheel with the lugs *r r* in the slot or grooves of the drill-stem. Then power is applied through the driving-shaft and the drill rapidly rotated by means of the rotating wheel and rings R R. The core-holder *h* rests on top of the core and by its weight and construction holds same upright and prevents its breaking apart and turning on itself by striking the sides of the drill when the drill is revolving. The point of the core-holder enters into the end of the core far enough to steady same and prevent the top from falling over to one side when it becomes long. The wheel *h''* being of about the diameter of the inside of the drill would strike the sides of the drill first in case there were any tendency for the core to fall over sideways and prevent the core from striking the drill. The wheel would freely revolve with the drill without turning the core. When the drill reaches nearly its length, or as long as core is cut, as desired, the drill and core-holder are withdrawn by removing the rings R R and raising same out of the hole. The core-extractor is then lowered into the hole, and being made of such diameter as to fit the core tightly it is forced down over it by means of a handle or rod attached to its upper end.

The core-extractor having an opening on one side allows the same to expand sufficiently to admit the core freely. Then when the same is drawn upward the upper edges of the teeth *e'' e''* engage with the core and prevent the core falling out and the whole is raised out together.

Having fully described my invention, what I claim as new, and desire to obtain by Letters Patent of the United States, is—

1. In a core-drilling machine, the combination of a hollow round vertical grooved drill-stem with ring-sections provided with vertical inwardly-projecting lugs and drill-wheel, all as above set forth and substantially as described.

2. In a core-drilling machine, the detached ring-sections R R, provided with the arms *r' r'* and perpendicular lugs *r r*, in combination with the grooved drill-stem S and the drill-wheel C and the recesses thereof, all as above set forth and substantially as described.

3. The core-extractor E, provided with the opening *e'* and inwardly-projecting teeth *e''* along the line of the opening *e'*, all as above set forth and substantially as described.

4. The core-holder *h*, provided with the wheel *h''*, in combination with the drill *s''*, all for the purposes above set forth and substantially as described.

5. A core-holder consisting of a rod *h*, passing through the drill-stem S, the lower end so constructed as to rest and bear on top of the core, in combination with the drill *s''*, all for the purposes above set forth and substantially as described.

MOSES BEAL.

Witnesses:

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E. C. MANTER.