

No. 690,878.

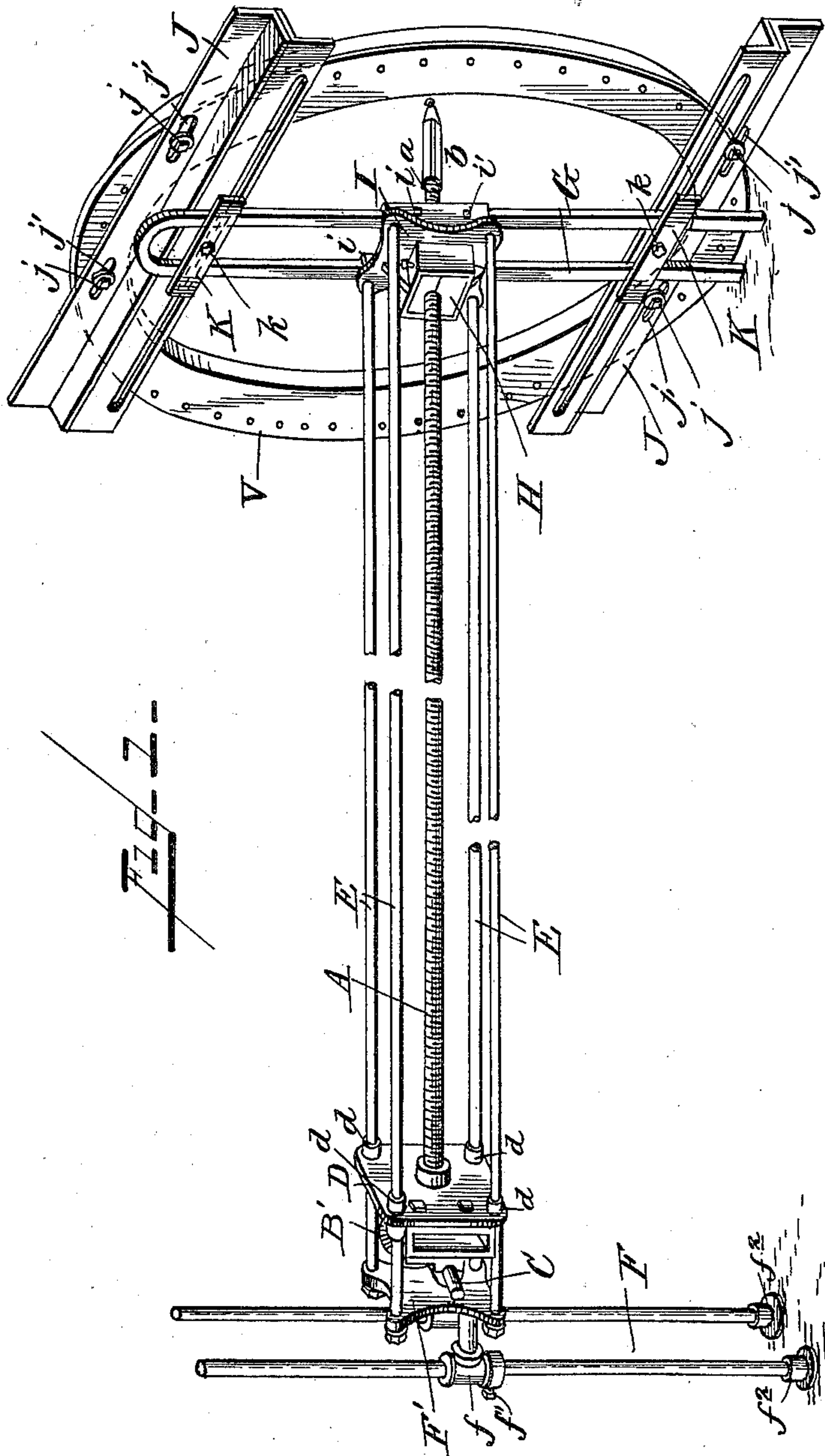
Patented Jan. 7, 1902.

J. ROAN.
APPARATUS FOR BORING OUT TUBES.

(Application filed Aug. 3, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses
F. L. Ourand

Edwin King Sludy

by

Marcellus Bailey

Inventor
James Roan

His Attorney

No. 690,878.

Patented Jan. 7, 1902.

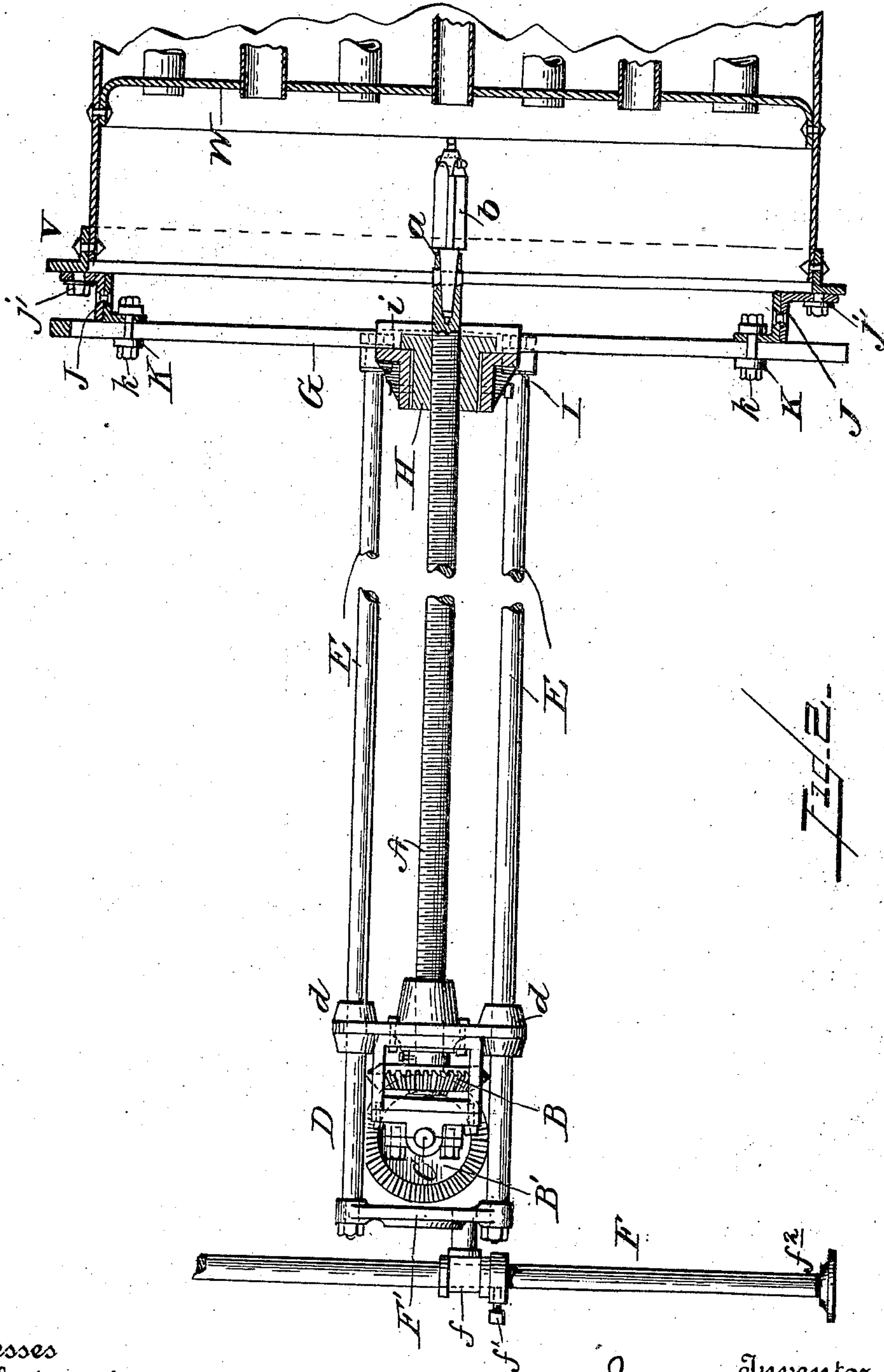
J. ROAN.

APPARATUS FOR BORING OUT TUBES.

(Application filed Aug. 3, 1901.)

(No Model.)

5 Sheets—Sheet 2.



Witnesses
F. L. Orland.

Edw. King Lundy

Inventor
James Roan
by Melville Bailey his Attorney

No. 690,878.

Patented Jan. 7, 1902.

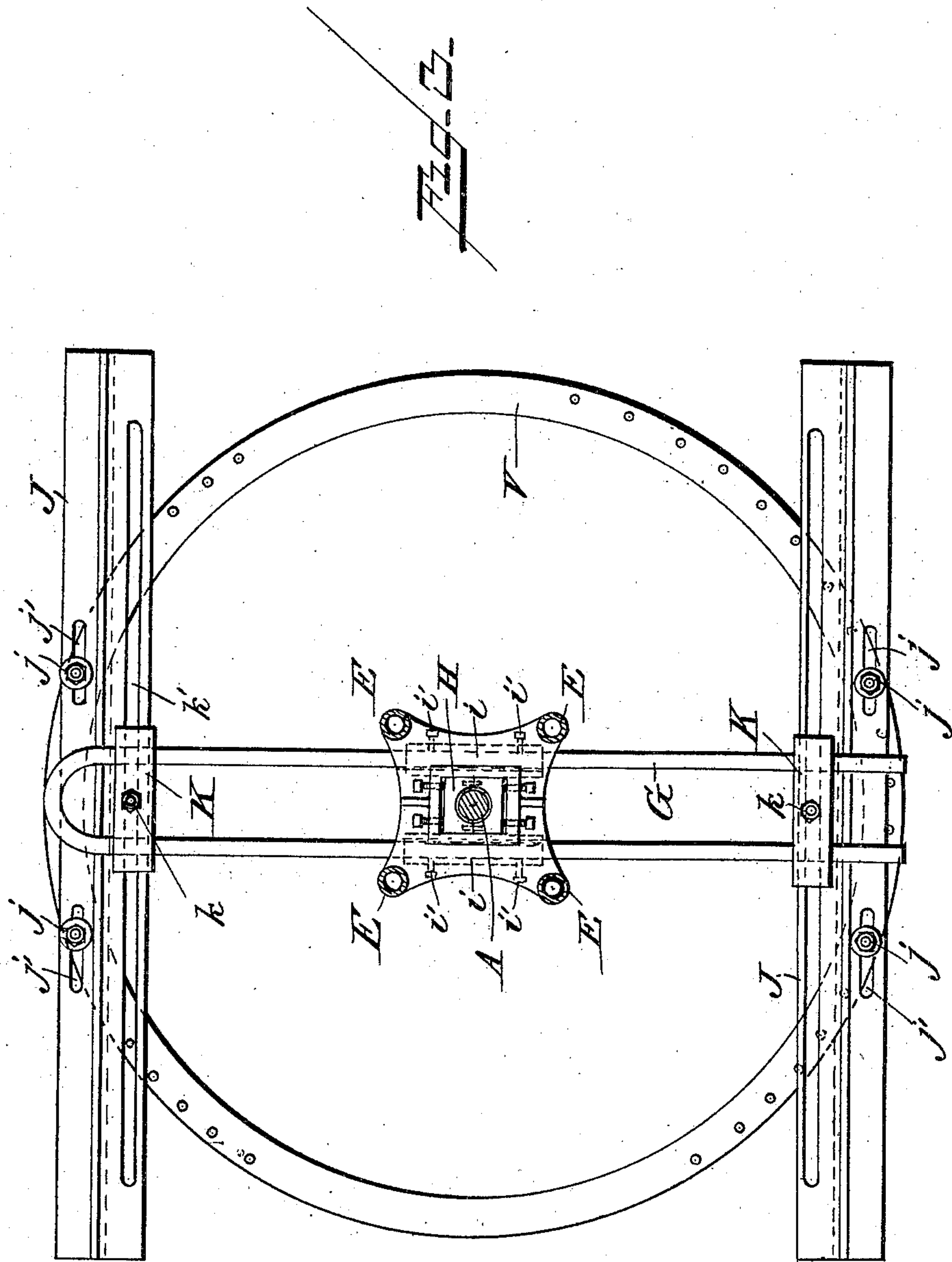
J. ROAN.

APPARATUS FOR BORING OUT TUBES.

(Application filed Aug. 3, 1901.)

(No Model.)

5 Sheets—Sheet 3.



Witnesses
F. L. Ourand
Edwin King Lundy

Inventor
James Roan
by *Marshall Bailey*
Attorney

No. 690,878.

Patented Jan. 7, 1902.

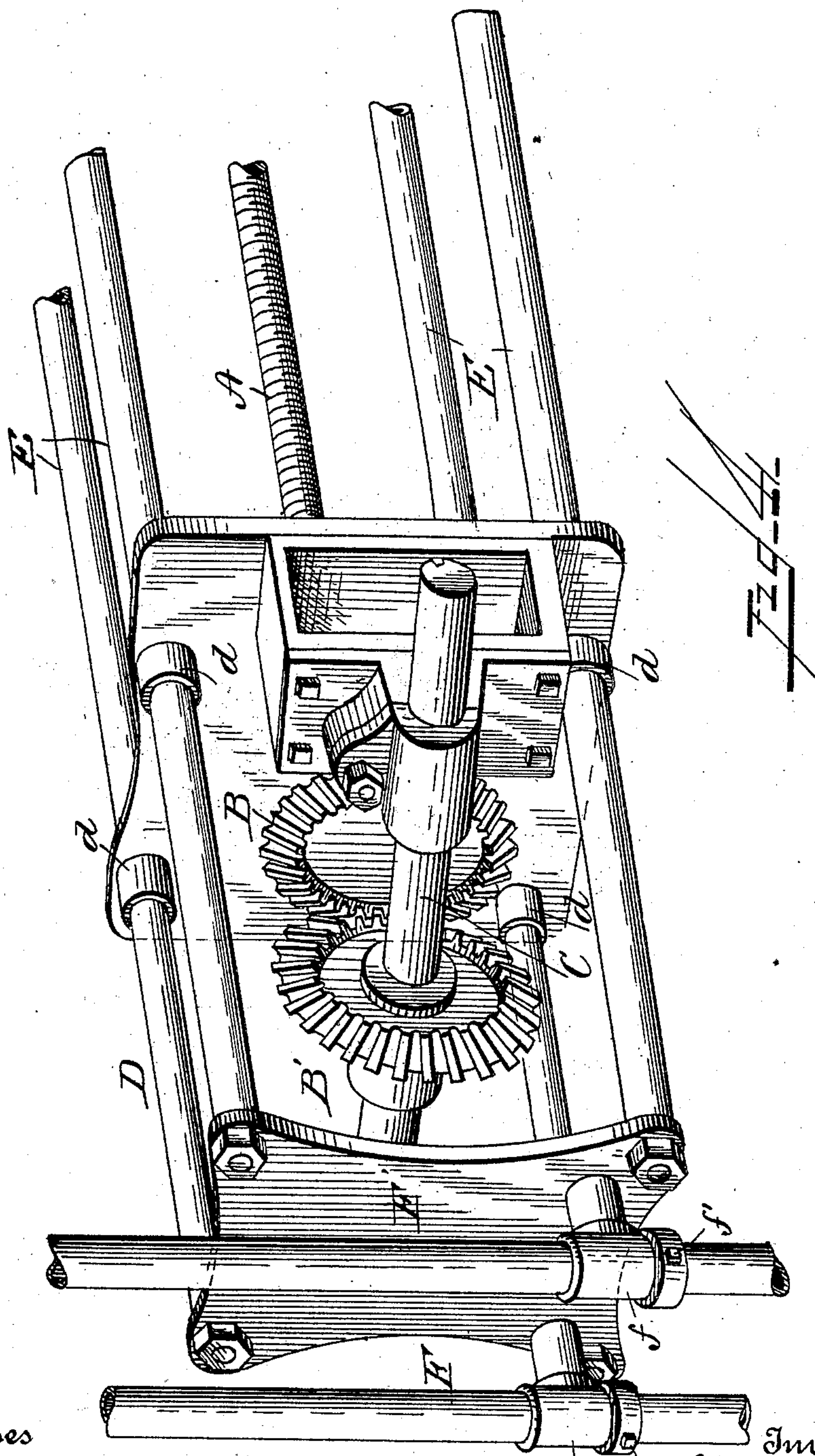
J. ROAN.

APPARATUS FOR BORING OUT TUBES.

(Application filed Aug. 3, 1901.)

(No Model.)

5 Sheets—Sheet 4.



Witnesses
F. L. Ourand
Edw. G. Lindy

Inventor:
James Roan
by Wm. C. Bailey
his Attorney

No. 690,878.

Patented Jan. 7, 1902.

J. ROAN.

APPARATUS FOR BORING OUT TUBES.

(Application filed Aug. 8, 1901.)

(No Model.)

5 Sheets—Sheet 5.

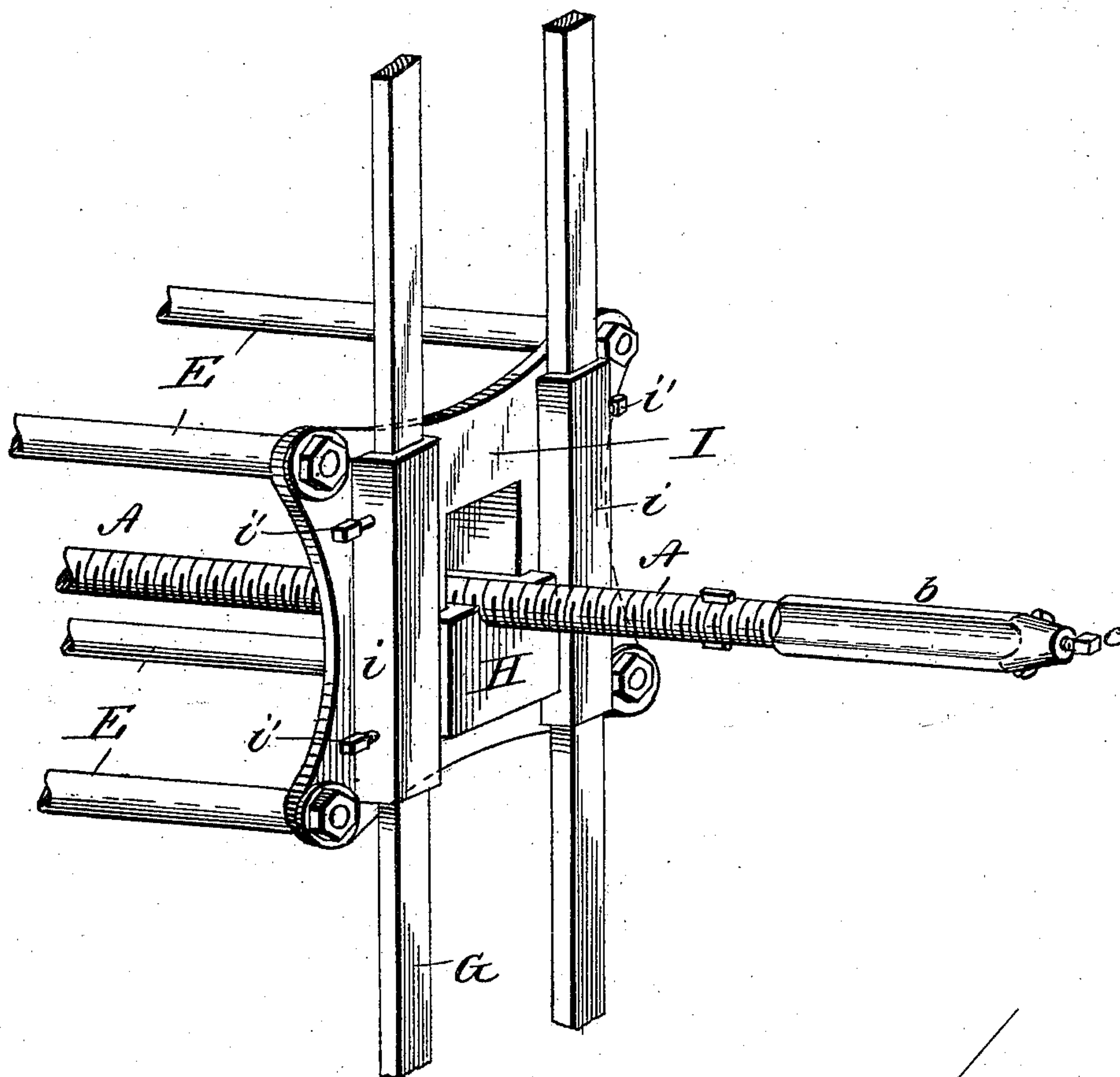


FIG. 5.

Witnesses
F. L. Ormand
Edwin King Ruddy

Inventor
James Roan
By *Marcellus Bailey*
his Attorney.

UNITED STATES PATENT OFFICE.

JAMES ROAN, OF PORTSMOUTH, VIRGINIA.

APPARATUS FOR BORING OUT TUBES.

SPECIFICATION forming part of Letters Patent No. 690,878, dated January 7, 1902.

Application filed August 3, 1901. Serial No. 70,787. (No model.)

To all whom it may concern:

Be it known that I, JAMES ROAN, a citizen of the United States, and a resident of Portsmouth, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Apparatus for Boring Out Tubes, of which the following is a specification.

The apparatus hereinafter described, while it may be employed for boring tubes and cylinders generally, has been designed with special reference to its use in boring out the tubes of condensers used in ice-plants for the purpose of condensing the exhaust-steam, the water which acts as the condensing or cooling agent passing through the tubes. When the water is held in the tubes, a coating is deposited on the inside of the tubes very much the same as in a water-tube boiler, and in the absence of an apparatus which will remove this coating it becomes necessary to take the tubes out and retube the condenser. It is in this connection that my apparatus will be described, although, as above said, it is not limited to this particular use, but can be employed in a number of other connections.

I will first describe by reference to the accompanying drawings, forming part of this specification, an apparatus embodying my improvements, and will then point out more particularly in the claims those features of the same which I believe to be new and of my own invention.

In the drawings, Figure 1 is a perspective view of the apparatus in the position which it occupies when ready for use in connection with a condenser. I omit from this figure all parts of the condenser except the ring up against which the front end of the apparatus is bolted. Fig. 2 is a sectional side elevation of the apparatus. Fig. 3 is a section on line 3 3, Fig. 2, looking toward the front end of the apparatus. Fig. 4 is a perspective view of the traveling carriage in which the lead-screw is mounted. Fig. 5 is a perspective view of the fixed nut and its supporting-frame at the front of the apparatus, through which the lead-screw passes. This nut is preferably a divided nut to facilitate the return of the lead-screw to the starting-point, and in this figure one-half of the nut is represented as removed.

A is a long lead-screw, which at its front end has a bit *a*, provided with a removable cutter *b*, held in place by a set-screw *c*. The lead-screw at its rear end is provided with a beveled gear B, which gears with another like gear B', mounted on a shaft C, through which motion is imparted to the gears, and consequently to the lead-screw. The gears B B' and the shaft C are mounted in bearings in a carriage D, provided with sleeves *d*, which fit and are capable of longitudinal movement on fixed guide-rods E, attached at front and rear to stands F G. In the front stand G is mounted a nut H, preferably a divided nut. The lead-screw passes through and engages this nut. The rotation of the lead-screw causes the feed of the said screw, the carriage D, which carries the driving mechanism, participating in the longitudinal movement of the screw and sliding on the four guide rods or bars E. The nut H is mounted in a supporting plate or frame I, provided with sleeves *i* to fit and slide upon the vertical legs of the stand G, set-screws *i'* being provided to hold the same in any position to which they may be adjusted up or down on the stand G.

To provide for the lateral adjustment of the lead-screw, the stand G is connected to and supported by horizontal plates J at top and bottom. These plates are bolted, as at *j*, to the ring V of the condenser W, the bolts passing into the bolt-holes already formed in the ring through slots *j'* in the plates. The stand G is secured to these plates by clamp-bars K, between which and the plates the legs of the stand are clamped and held by means of bolts *k*, which pass through longitudinal slots *k'* in the plates J. By loosening these bolts the stand G can be moved laterally. Provision for similar adjustment of the rear end of the apparatus is made. For this purpose the rear stand consists of two upright posts F, upon which fit the sleeves *f* of the bracket-plate F', to which latter the rear ends of the rods E are secured. The sleeves *f* are vertically movable upon the stand-posts F and are held in their adjusted position by set-screws *f'*. The posts F are provided with feet *f*², which rest on the floor or may be attached to a floor-plate that rests on the floor, and they are movable laterally bodily and together. In this way the lead-screw with its cutter can be brought oppo-

site to any one of the tubes *w* of the condenser
 W which it is desired to bore out. When
 after the lead-screw has been brought into
 alinement with the condenser-tube to be
 5 bored out the driving-gear is put in motion,
 the lead-screw rotates and in so doing ad-
 vances the cutter into the tube, the carriage
 D participating in the lengthwise movement
 of the lead-screw. After the tube has been
 10 bored out the cutter and lead-screw can be
 withdrawn by reversing the direction of ro-
 tation of the latter; but as a simple way of
 effecting this the nut H is divided, so that
 one of its halves can be taken out, as shown
 15 in Fig. 5, and then the lead-screw and its at-
 tached parts can be readily and quickly pulled
 back.

The shaft C can be rotated in any suitable
 way either by power—as, for example, by a
 20 small motor mounted on the carriage D—or
 by hand through the intermediary of a crank-
 handle, as will be understood without further
 explanation.

Having described my improvements and
 25 the best way now known to me of carrying
 the same into effect, what I claim herein as
 new, and desire to secure by Letters Patent, is
 as follows:

1. The front and rear stands, the nut-sup-

porting frame sleeved on the front stand, the 30
 feed-nut, longitudinal guide-rods attached at
 the front to the nut-supporting frame, and
 sleeved upon the rear stand, and means for
 holding the frame and rods in their adjusted
 position upon said stands, in combination with 35
 a carriage mounted on said guide-rods and a
 lead-screw and driving-gearing therefor
 mounted in said carriage as and for the pur-
 poses hereinbefore set forth.

2. The front and rear stands, and the plates 40
 to which the front stand is secured so as to be
 laterally adjustable with relation thereto, in
 combination with the feed-nut and its sup-
 porting-frame the guide-rods extending be- 45
 tween and connecting said stands, said nut-
 supporting frame and guide-rods being ver-
 tically adjustable bodily and together rela-
 tively to the stands, the carriage supported
 by and movable on the guide-rods, and the
 lead-screw and driving-gearing therefor 50
 mounted in the carriage, substantially as and
 for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set
 my hand.

JAMES ROAN.

Witnesses:

R. L. STEPHENSON,
 WM. PETERS.