

L. B. FLANDERS.
APPARATUS FOR BORING CYLINDERS.

No. 66,011.

Patented June 25, 1867.

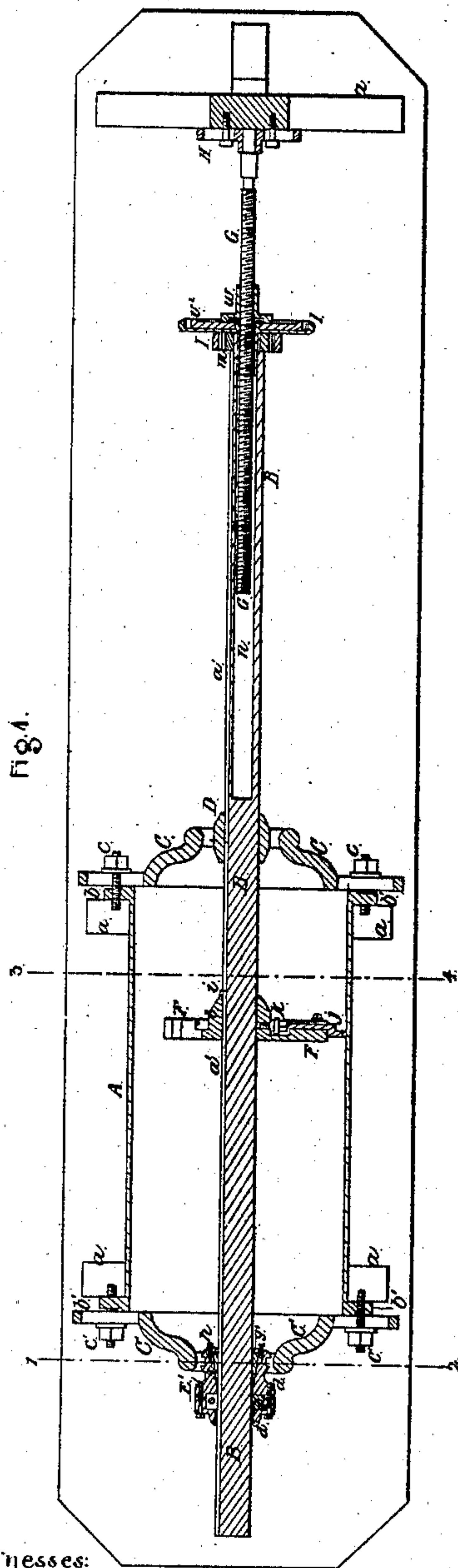


Fig. 1.

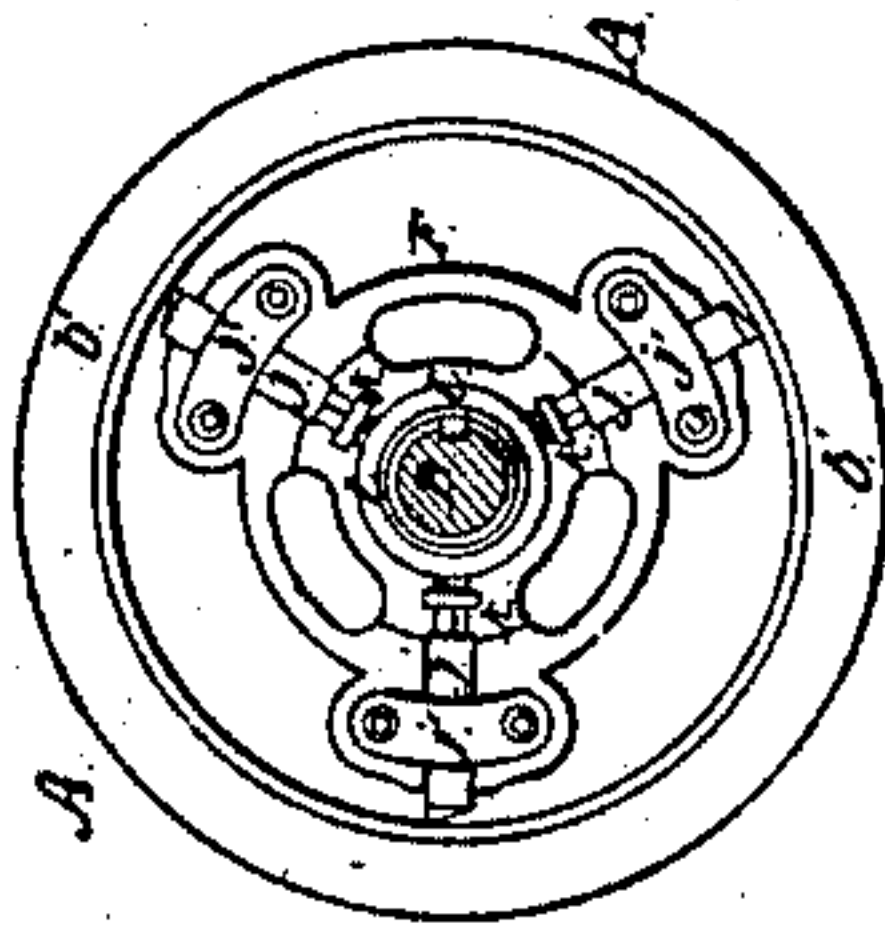


Fig. 3.

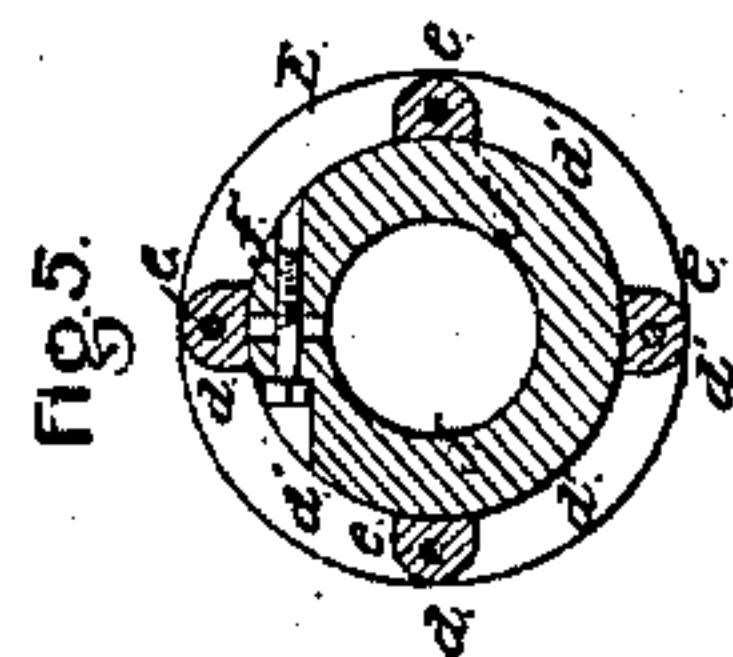


Fig. 5.

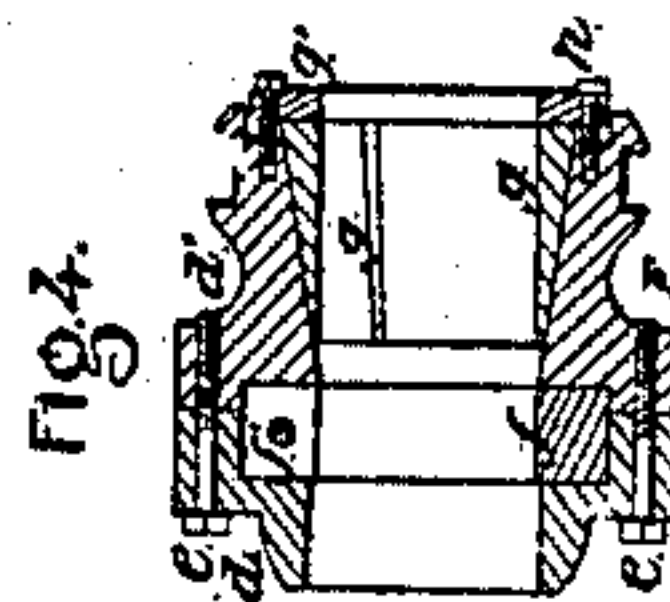


Fig. 4.

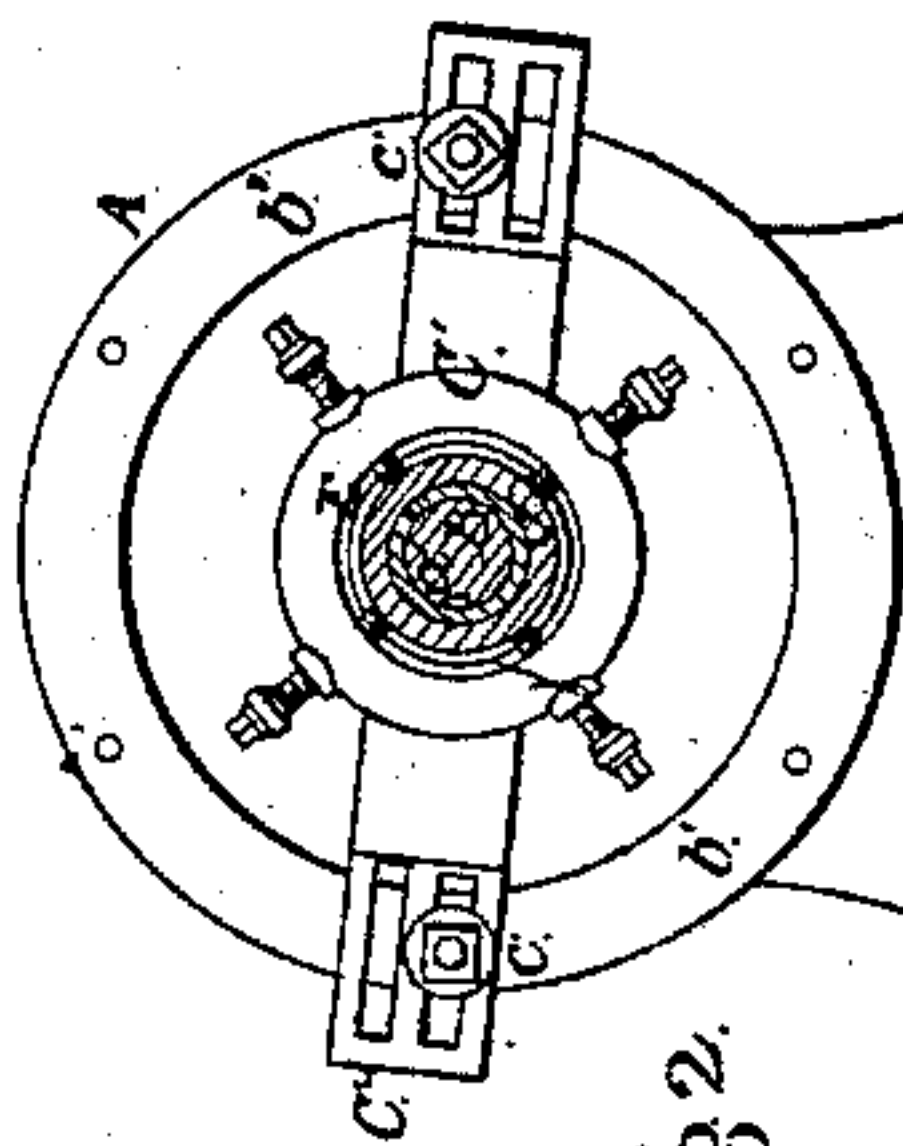


Fig. 2.

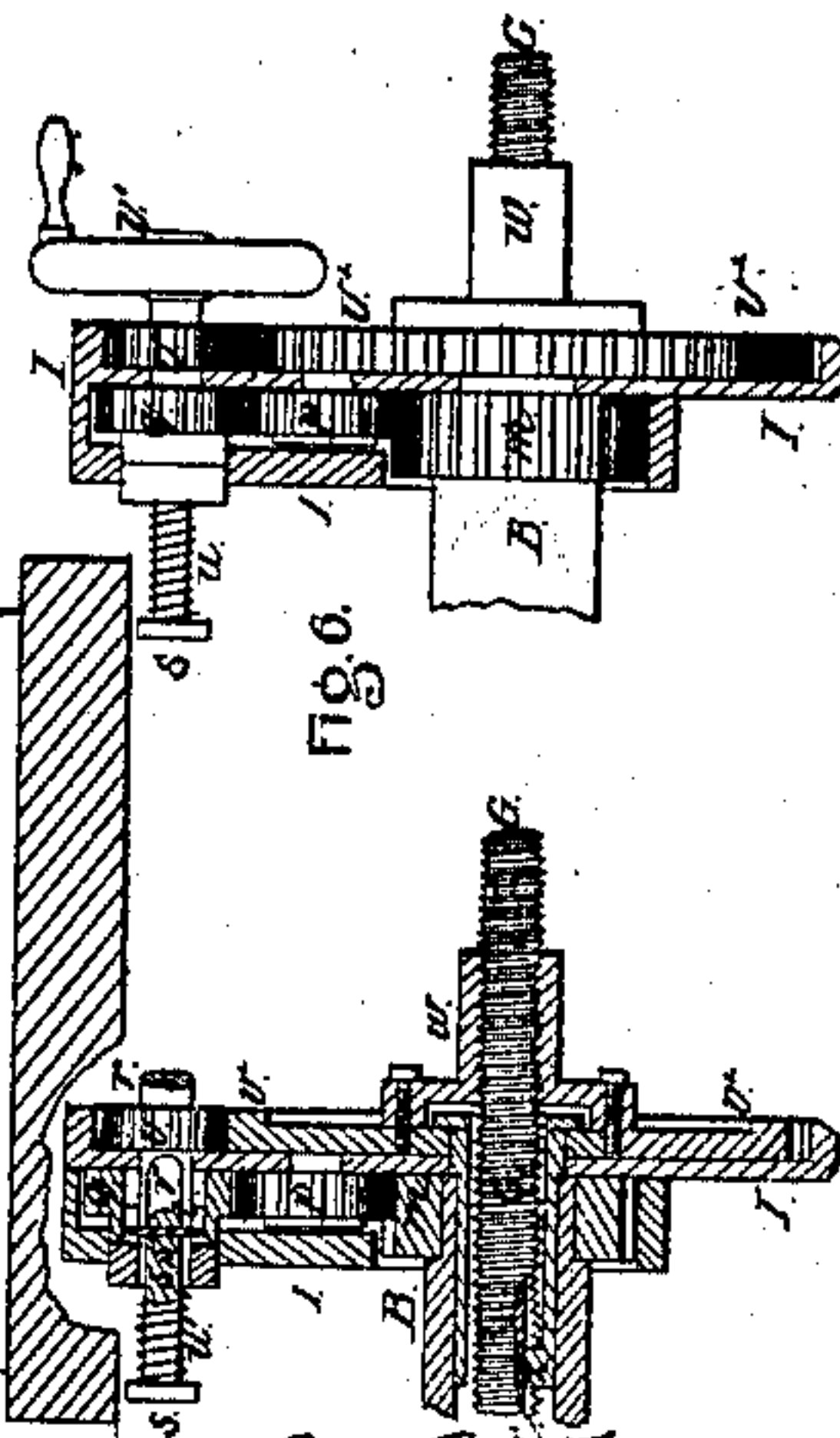


Fig. 6.

Witnesses:

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L. B. FLANDERS, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 66,011, dated June 25, 1867.

IMPROVED APPARATUS FOR BORING CYLINDERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, L. B. FLANDERS, of Philadelphia, Pennsylvania, have invented certain Improved Mechanism for Boring Cylinders; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists of certain devices, fully described hereafter, to be used in connection with mechanism for boring out horizontal, inclined, or vertical cylinders, without removing them from their foundations.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation. On reference to the accompanying drawing, which forms a part of this specification—

Figure 1 is a sectional plan view of my improved mechanism for boring out cylinders, &c.

Figure 2, a transverse vertical section on the line 1-2, fig. 1.

Figure 3, a transverse section on the line 3-4, fig. 1, showing the cutting-head.

Figures 4 and 5, enlarged views of one of the bearings through which the boring-bar passes.

Figure 6, an outside view of the feeding device, with the case in section; and

Figure 7 a longitudinal section of the feeding device.

Similar letters refer to similar parts throughout the several views.

A represents a cylinder, from which both heads have been removed, and which, in the present instance, is horizontal. B is the boring-bar, which has a longitudinal groove, a' , for a purpose described hereafter. To the flange b , at one end of the cylinder, is secured a cross-plate, C, by means of suitable bolts, c , in such a manner that the said plate can be readily adjusted laterally on the flange. The central portion of this plate C is made in the form of a ring, (fig. 2,) through which pass four set-screws, the latter serving to confine and adjust within the ring the sleeve D, in which the boring-bar turns. A similar cross-plate, C', is secured to the flange b' of the cylinder by bolts c' , and a bearing, E, is secured to the same by set-screws. On reference to figs. 4 and 5, it will be seen that the bearing E, in which the boring-bar turns, consists of two parts, d and d' , secured to each other by bolts e . Between these two parts of the bearing E is a split ring, f , through which the boring-bar passes, this ring being contracted by a screw, f' , when it becomes necessary to prevent the bar from moving endways. In the portion d' of the bearing is a conical recess, in which fits a conical split ring, g , and against the outer edge of the latter bears another ring, g' , which has a greater diameter than either of the others, and which is secured to the bearing E by means of set-screws h . By tightening them the split ring is forced into the conical recess in the bearing, and its diameter thereby lessened—an operation which becomes necessary, from time to time, as the bearing wears. The cutting-head F is secured by means of a key, i , to the boring-bar at any desired point, and is substantially the same as that described in my patent of September 20, 1864, being provided with three or more cutters, j , secured by means of plates j' , (see fig. 3,) and the cutters being maintained at a proper distance from the centre by means of studs k screwing into the hub l of the cutting-head, at the outer end of the boring-bar B, is a cog-wheel, m , and the bar is made tubular throughout a portion of its length for the reception of the feeding-screw G, which is secured at one end to an adjustable plate, H, which may be bolted to or may bear against any stationary object. The cog-wheel m , on the end of the boring-bar, is contained in a casing, I, and gears into a cog-wheel, p , which turns on a pin secured to the case, and the latter wheel gears into another wheel, q , on a hollow spindle, r , (fig. 7,) into which fits a rod, s , and through and near the end of the latter passes a pin, s' , which projects from each side of the rod, and through slots formed in the spindle r into grooves t in the cog-wheel q . By the action of a spiral spring, u , on the rod s , the pin s' has a constant tendency to remain in these grooves t , but by pressing upon the end of the rod s , the spring is compressed, and the pin s' passes from the grooves t into a circular recess in the cog-wheel q , thereby enabling the latter to turn freely around, and independently of the spindle r . The object of this arrangement will be apparent hereafter. On the spindle r , and in another compartment of the casing I, is a cog-wheel, v , and the spindle terminates in a hand-wheel, v^1 . Gearing into the wheel v is a larger cog-wheel, v^2 , which turns on a projecting portion of the casing I, and whose centre coincides with that of the boring-bar. On the face of the cog-wheel v^2 is a nut, w , in which are formed threads corresponding with those cut upon the feeding-screw G. The casing I is prevented from revolving with the boring-bar by means of a tongue, x , (fig. 7.)

projecting from a portion of the casing into a groove, x' , which extends the entire length of the stationary feeding-screw G.

The several parts having been arranged as described, and the boring-bar and cutting-head moved to that end of the cylinder from which the boring is to commence, motion is communicated to the boring-bar by any suitable appliances. As the boring-bar revolves and the casing I remains stationary, motion is communicated from the cog-wheel m to the wheel p , then to the wheels q and v upon the hollow spindle r , and thence to the larger cog-wheel v^2 , and nut w , thereby causing the casing I, its train of wheels, and the boring-bar to move longitudinally on the stationary screw G. When it is desired to move the boring-bar and cutting-head quickly to any particular point in the cylinder, the rod s is first forced into the hollow spindle r until the pin s' passes from the grooves t of the cog-wheel q into the circular recess formed in the same; the hand-wheel v' on the spindle r is then turned, causing the cog-wheels v and v^2 to revolve, while the wheel q , which has been thrown out of gear, remains stationary. As the cog-wheel v^2 revolves, the boring-bar and cutting-head will be quickly forced through the cylinder by means of the nut w and feeding-screw, without revolving. It is sometimes necessary, in boring a cylinder, to draw back the cutting-head for the purpose of re-boring a particular part; this may be done, without stopping the rotary motion of the boring-bar, by throwing the cog-wheel q out of gear. The wheel m , and consequently the wheels p and q , will continue to revolve, but the spindle r will remain stationary until operated by the handle v' , by means of which, as before described, the cutting-head may be drawn back to the desired point. When the cutting-head has to be used for facing the ends or flanges of the cylinders, the feeding device is thrown out of gear, and the bar is held stationary by tightening the split ring f .

I claim as my invention, and desire to secure by Letters Patent—

1. The combination of the boring-bar B, the casing I, its train of wheels herein described, or the equivalent to the same, the nut w , and the stationary feeding-screw G, the whole being arranged and operating substantially as described.
2. The cog-wheel q , its circular recess and grooves t , in combination with the hollow spindle r and the rod s , with its pin s' and spiral spring u , the whole being arranged and operating substantially in the manner and for the purpose set forth.
3. The bearing E, in combination with the adjustable and conical split ring g and ring g' , or its equivalent, the whole being constructed and arranged substantially as described.
4. The split ring f in combination with the bearing E, as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

L. B. FLANDERS.

Witnesses:

WM. HALL WAXLER,
W. J. R. DELANY.