

No. 763,770.

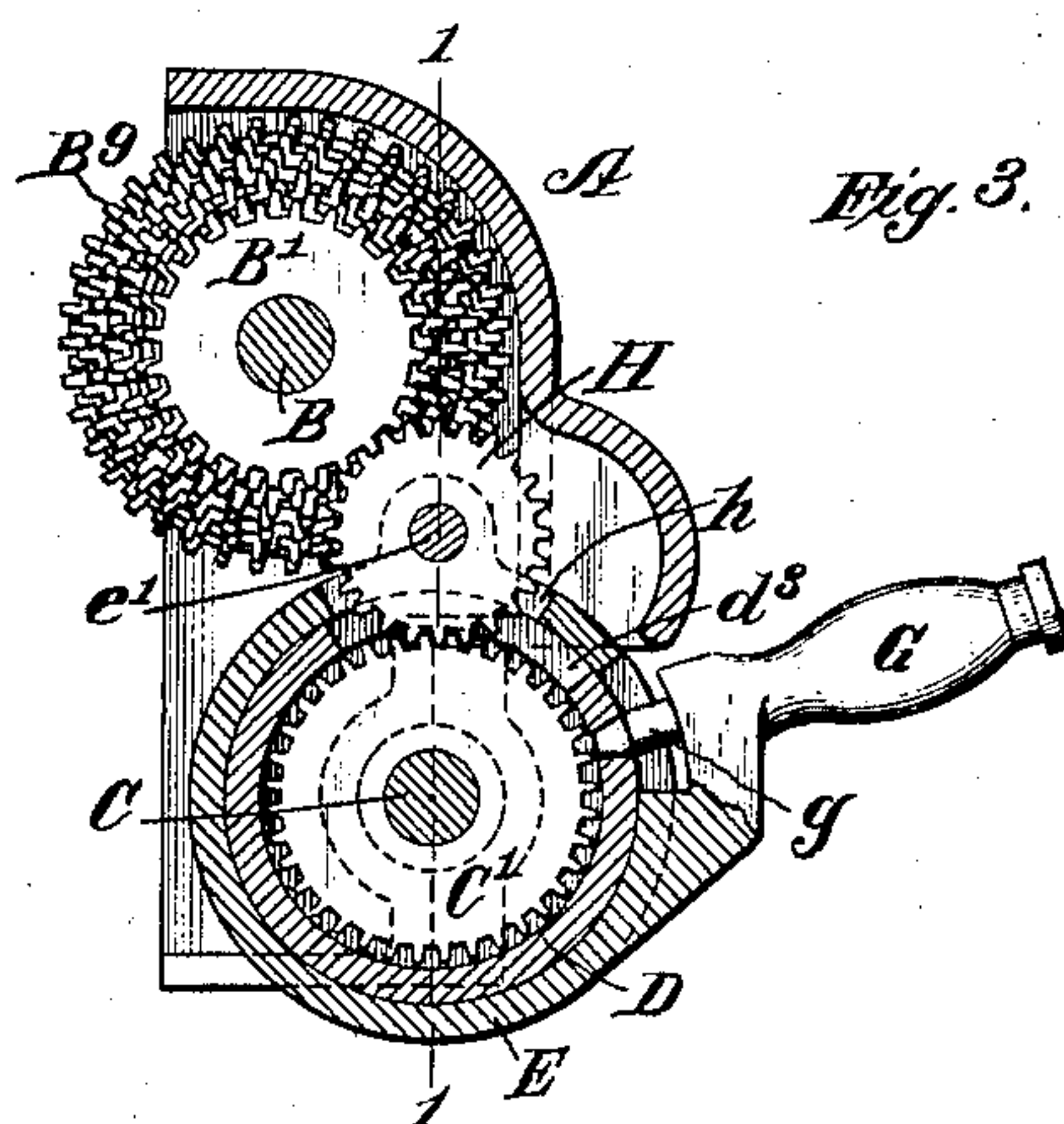
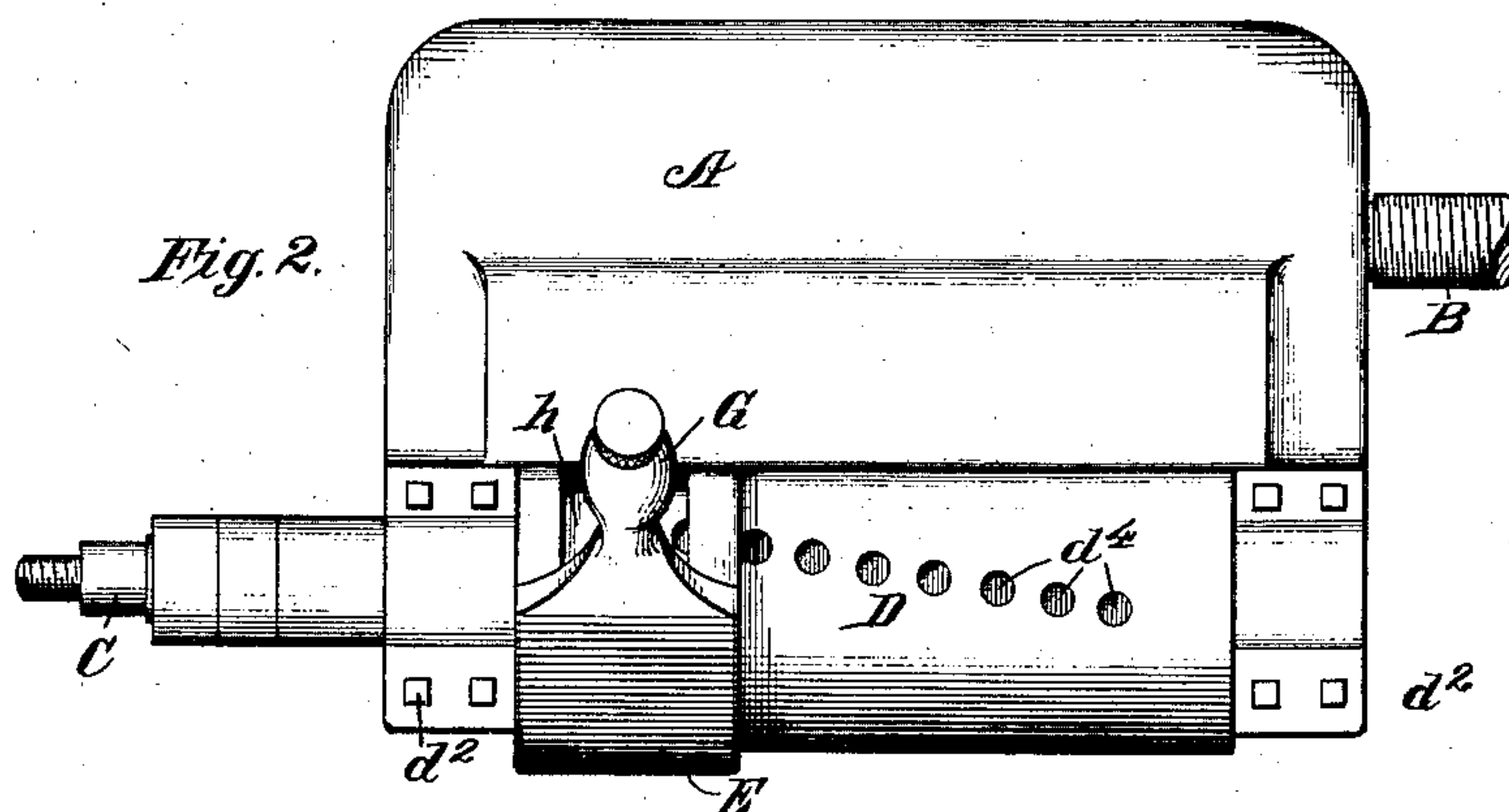
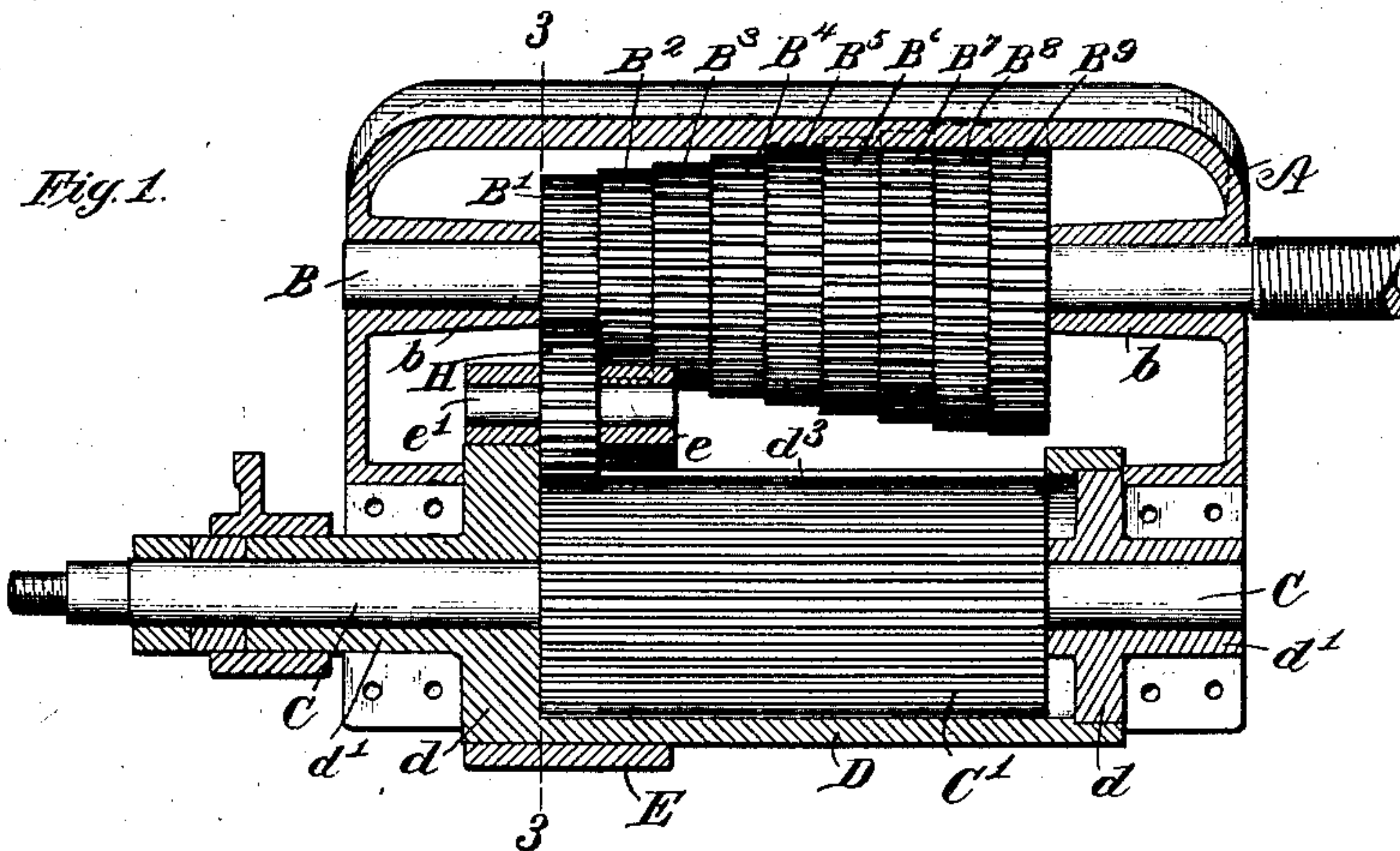
PATENTED JUNE 28, 1904.

R. K. LE BLOND & W. F. GROENE.

FEED AND SPEED CHANGING DEVICE FOR MACHINE TOOLS.

APPLICATION FILED APR. 2 1904.

NO MODEL.



WITNESSES:

H. S. Austin
H. F. Bradley

INVENTORS
Richard H. LeBlond
William F. Greene
BY Robt. P. Haines
ATTORNEY

UNITED STATES PATENT OFFICE.

RICHARD K. LE BLOND AND WILLIAM F. GROENE, OF CINCINNATI, OHIO.

FEED AND SPEED CHANGING DEVICE FOR MACHINE-TOOLS.

SPECIFICATION forming part of Letters Patent No. 763,770, dated June 28, 1904.

Application filed April 2, 1904. Serial No. 201,257. (No model.)

To all whom it may concern:

Be it known that we, RICHARD K. LE BLOND and WILLIAM F. GROENE, citizens of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Feed and Speed Changing Devices for Machine-Tools, of which the following is a specification.

The invention to be hereinafter described relates to feed and speed changing devices for machine-tools wherein a series of gears of different diameters and, in effect, constituting a cone of gears are driven from a driving-gear through an intermediate gear, and has for its general object to provide a device of simple construction capable of ready manipulation to effect the changes desired and wherein the intermediate or transmitting gear shall have great ease of movement in changing its position to effect the desired speed.

With the above general objects in view the invention consists of mechanical parts and combinations to be hereinafter more fully explained, and definitely pointed out in the claims.

In the drawings, which show one embodiment of the invention, Figure 1 is a cross-section on the line 1 1 of Fig. 3. Fig. 2 is a front elevation of the device, and Fig. 3 is a section on line 3 3 of Fig. 1.

Mounted in suitable bearings *b b* in the frame or casing *A* is the shaft *B*, carrying a series of gears *B' B''* of different diameters, which, in effect, may constitute a cone of gears to which motion is to be imparted. In case the shaft *B* is to be driven from the cone of gears the latter will of course be properly secured thereto, and in such event said shaft *B* may constitute the lead-screw of a machine-tool, as shown in the present embodiment of the invention.

The elongated gear *C'*, which constitutes the driving-gear, may receive motion from any suitable source, and in the form of the invention shown is mounted upon a driving-shaft *C*, which may be operatively engaged with the driving power in any usual manner not necessary to show, as the same is well understood by those skilled in the art.

Disposed about the elongated driving-gear *C'* is the stationary cylinder *D*, which for identification may be termed the "bearing-cylinder." The bearing-cylinder *D* is concentric with and surrounds the elongated driving-gear, the ends *d d'* of said bearing-cylinder being preferably formed with journals *d' d'* for the driving-shaft *C* and properly secured by bolts *d'' d''* to the casing *A*. The details of structure are not essential, as will be understood, but may be varied within wide limits without departing from the spirit of the invention; but the form shown is found to be efficient and is preferred. The bearing-cylinder *D* is provided in the part thereof adjacent the cone of gears with a longitudinal slot *d'''* for a purpose that will hereinafter appear.

Rotatably mounted upon the bearing-cylinder *D* is the bush *E*, which for identification may be termed the "intermediate-gear carrier." This carrier, while closely fitting about the bearing-cylinder and rotatable thereon, is also free to be moved longitudinally thereof by means of a handle *G* and locked in position by any suitable means—as, for instance, the locking-pin *g* engaging any one of the series of holes *d''*, formed in the bearing-cylinder.

The intermediate-gear carrier *E* is provided with an opening or slot *h*, on each side of which are the projections or bearings *e e*, in which is mounted a shaft *e'*, carrying an intermediate gear *H*, which projects through opening or slot *h* and, the longitudinal slot *d'''* of the bearing-cylinder *D* and is in constant driving connection with the elongated driving-gear *C'*. The longitudinal slot *d'''* is of sufficient width to permit the carrier *E* to be turned about the bearing-cylinder sufficient to cause the intermediate gear *H* to be engaged with or disengaged from any one of the cone of gears *B' B''*.

From the construction thus described and as constituting one form of the present invention it will be seen that the driving-gear is constituted as an elongated gear and that the intermediate gear while in constant operative engagement therewith is bodily movable circumferentially or about the axis thereof as

well as longitudinally with respect thereto, and by reason of the large bearing-cylinder surrounding the elongated driving-gear that great freedom of movement of the intermediate gear bodily about and longitudinally of the axis of the driving-gear to change the speed of the cone of gears is secured. To change the speed, it is only necessary to withdraw the locking bolt or pin *g* from engagement with the holes *d*⁴, swing the intermediate-gear carrier about its bearing upon the bearing-cylinder, and move the carrier longitudinally and with it the intermediate gear *H* to position opposite the desired gear of the cone of gears, whereupon the intermediate-gear carrier can be turned to bring the intermediate gear *H* into engagement with the cone of gears in the new position and the parts locked by the pin *g* entering a hole *d*⁴.

If desired, safety devices may be employed to prevent accidental partial engagement of the intermediate gear simultaneously with two of the gears of the cone of gears; but as this forms no part of the present invention and is well understood in the art it is not necessary to show and describe the same in this connection.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a feed and speed changing mechanism for machine-tools, the combination of a series of gears of varying diameters, an elongated driving-gear, a bearing-cylinder disposed about the elongated driving-gear, an intermediate-gear carrier movable axially about and longitudinally of the bearing-cylinder, and an intermediate gear mounted on said carrier, and in constant engagement with the elongated driving-gear.

2. In a feed and speed changing mechanism for machine-tools, the combination of a series of gears of varying diameters, an elongated driving-gear, a bearing-cylinder disposed about the elongated driving-gear, an intermediate-gear carrier movable axially about and longitudinally of the bearing-cylinder and an intermediate gear mounted on said carrier,

and in constant engagement with the elongated driving-gear, and means for locking the intermediate-gear carrier in axial and longitudinal adjusted position.

3. In a feed and speed changing mechanism for machine-tools, the combination of a series of gears of varying diameters, an elongated driving-gear, a bearing-cylinder surrounding said gear, an intermediate-gear carrier movable about and longitudinally of said driving-gear, an intermediate gear mounted on said carrier and in constant engagement with the elongated driving-gear and means for moving the said carrier and intermediate gear in the manner described.

4. In a feed and speed changing mechanism for machine-tools, the combination of a series of driven gears, an elongated driving-gear, a stationary bearing-cylinder provided with a longitudinal slot and surrounding said elongated driving-gear, an intermediate-gear carrier, an intermediate gear mounted thereon and extending through the slot of the bearing-cylinder and in engagement with the driving-gear, and means for moving said carrier and intermediate gear axially about and longitudinally of the elongated driving-gear.

5. In a feed and speed changing mechanism for machine-tools, the combination of a driven shaft, a cone of gears thereon, a driving-shaft, an elongated driving-gear secured thereto, a slotted bearing-cylinder surrounding said elongated driving-gear, an intermediate-gear carrier movable axially about and longitudinally of said cylinder, an intermediate gear mounted on said carrier and extending through the slot of the said bearing-cylinder and in constant engagement with the elongated driving-gear, and means for locking the carrier and intermediate gear in adjusted position.

In testimony whereof we affix our signatures in presence of two witnesses.

RICHD. K. LE BLOND.
WILLIAM F. GROENE.

Witnesses:

GEO. T. PRITCHARD,
CLARENCE EICH.