

No. 684,944.

Patented Oct. 22, 1901.

G. W. MORETON.  
BORING AND TURNING MILL.

(Application filed July 1, 1901.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

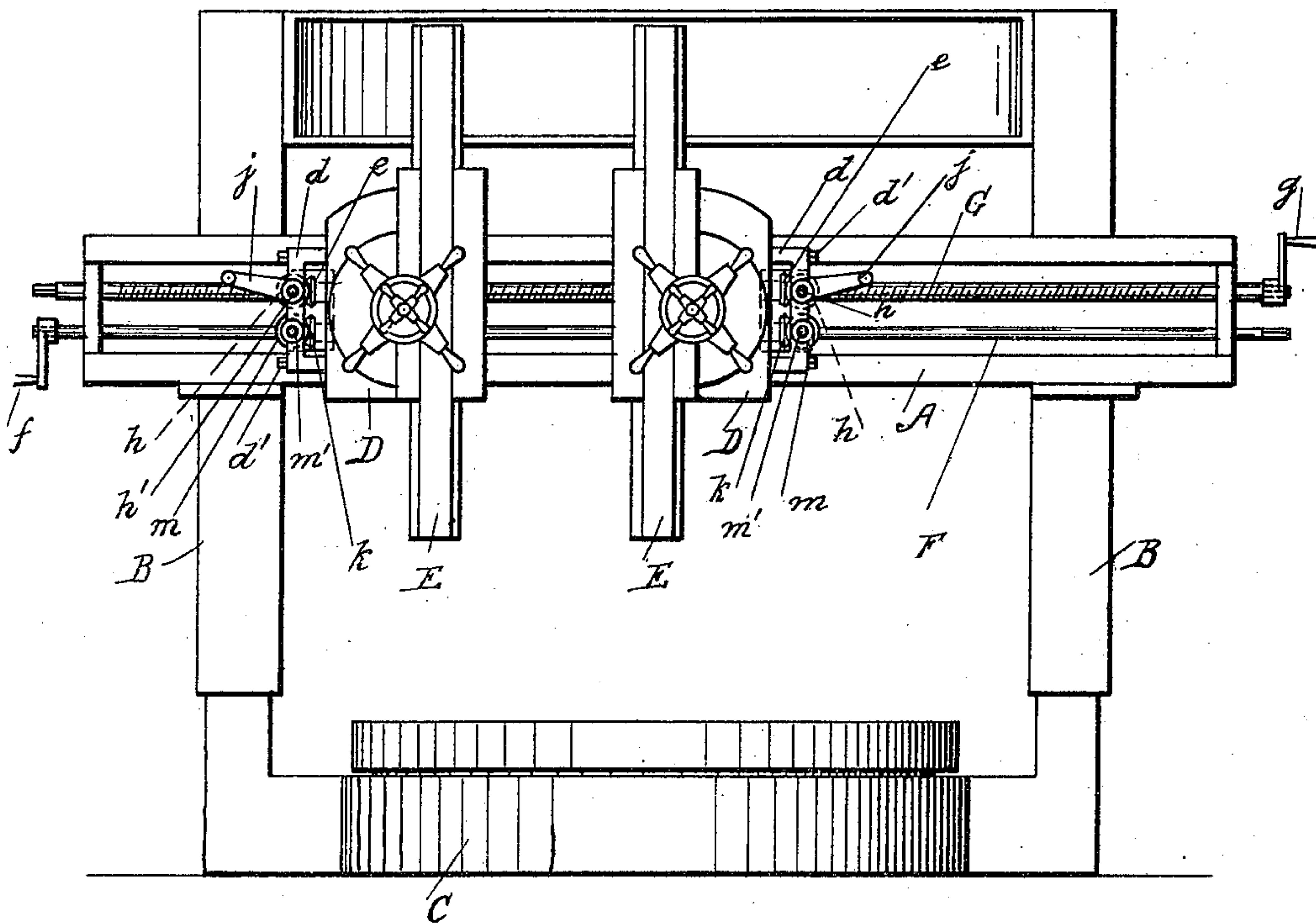


FIG. 2.

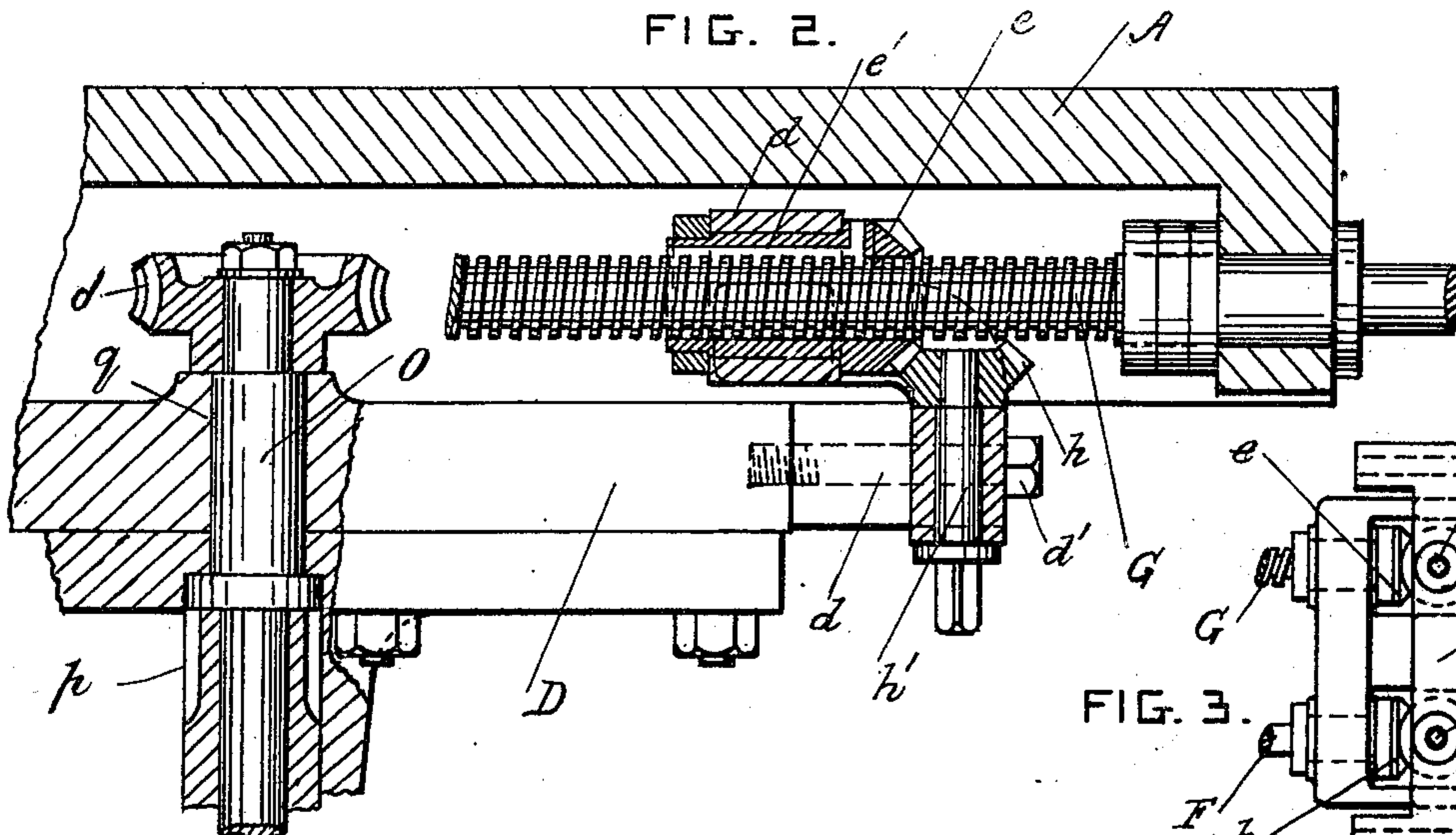
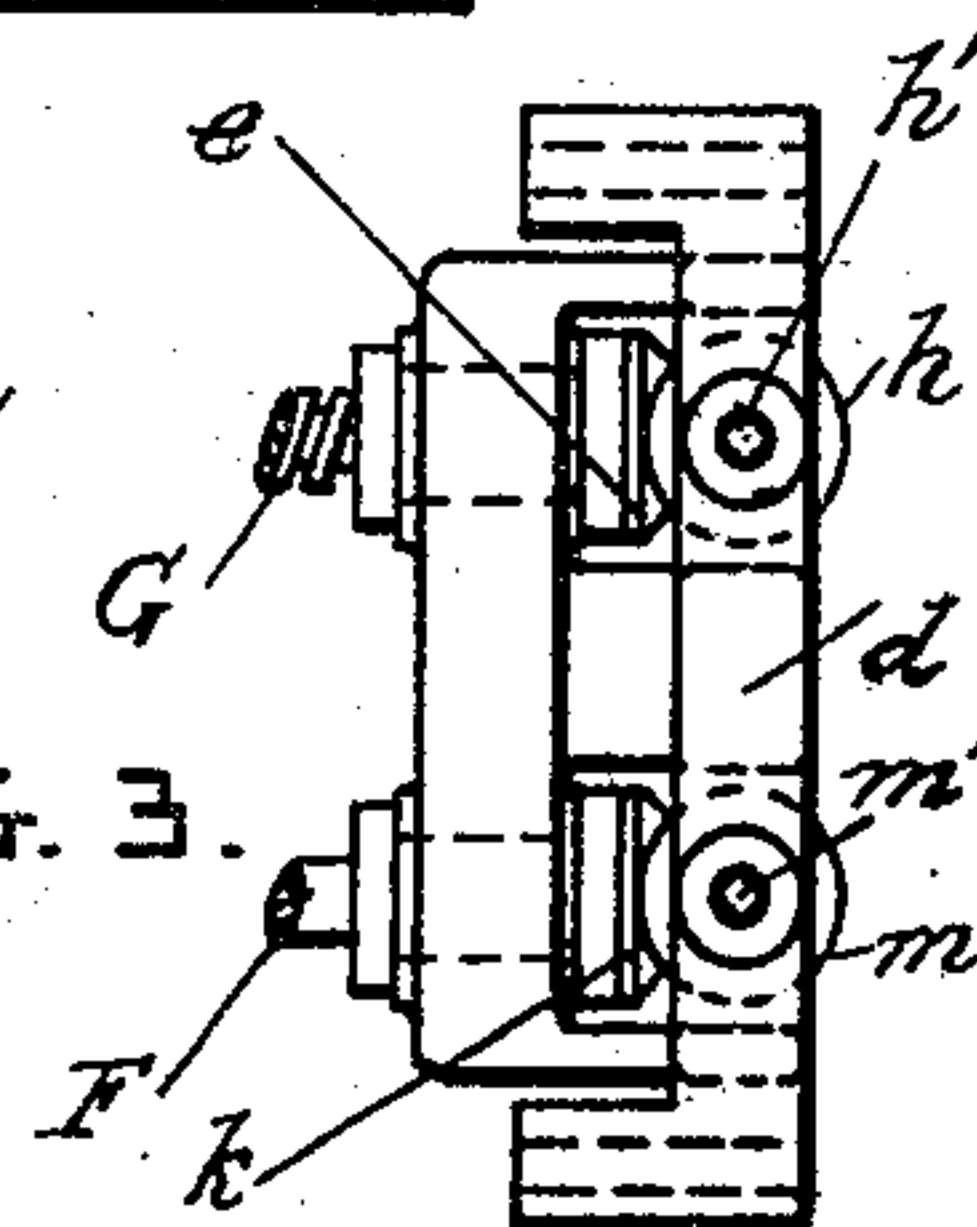


FIG. 3.



WITNESSES

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No. 684,944.

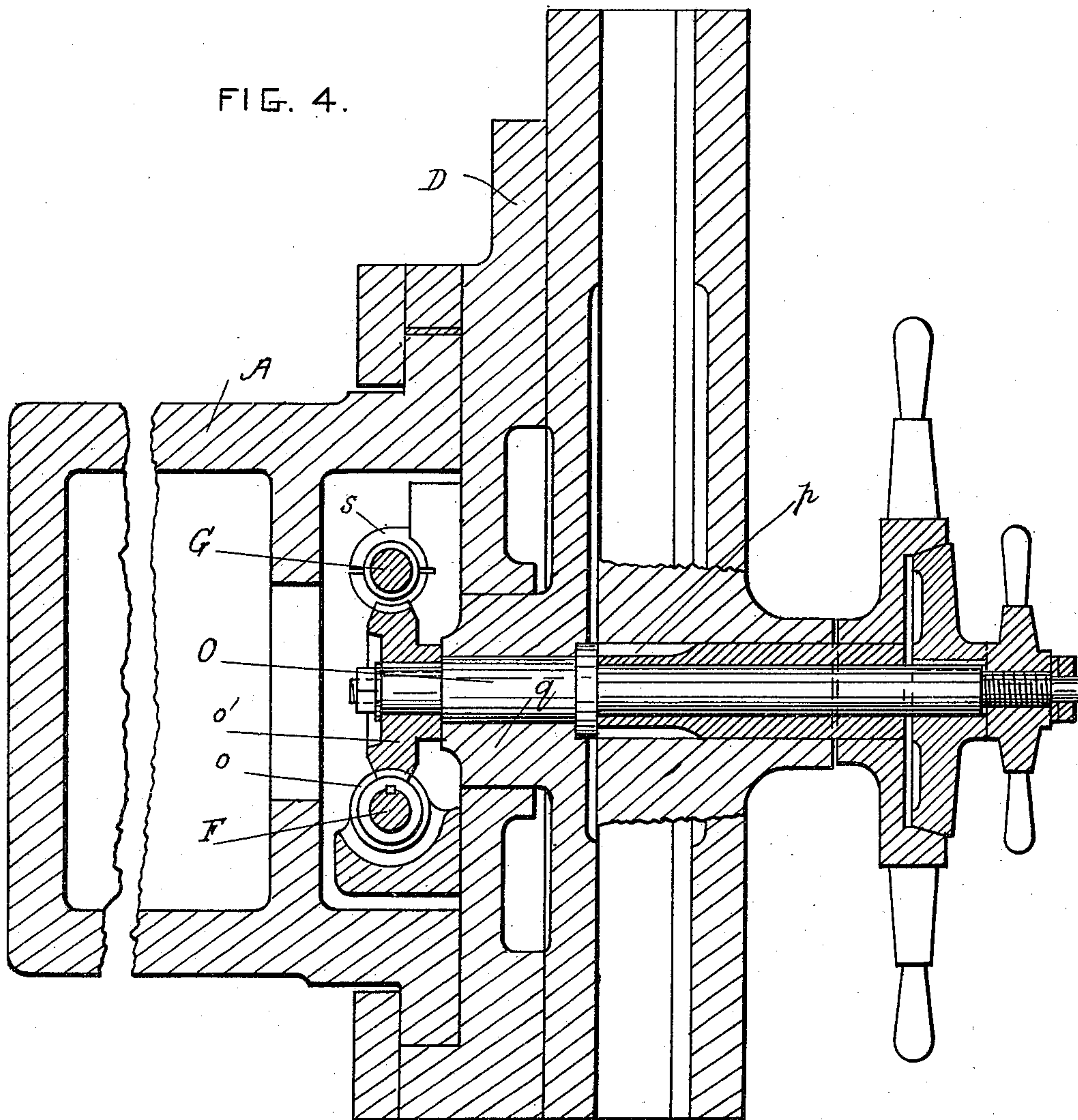
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2 Sheets—Sheet 2.



WITNESSES

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# UNITED STATES PATENT OFFICE.

GEORGE WILLIAM MORETON, OF WILMINGTON, DELAWARE, ASSIGNOR TO  
BETTS MACHINE COMPANY, OF WILMINGTON, DELAWARE.

## BORING AND TURNING MILL.

SPECIFICATION forming part of Letters Patent No. 684,944, dated October 22, 1901.

Application filed July 1, 1901. Serial No. 66,688. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE WILLIAM MORETON, a citizen of the United States, residing at Wilmington, in the county of Newcastle and State of Delaware, have invented certain new and useful Improvements in Boring and Turning Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to boring and turning mills; and it consists in the novel construction and combination of the parts, hereinafter fully described and claimed, whereby the cutting-tool is adjusted.

In the drawings, Figure 1 is a front view of a boring and turning mill provided with an attachment according to this invention. Fig. 2 is a sectional plan view of the attachment drawn to a larger scale. Fig. 3 is a detail view. Fig. 4 is a cross-section through the cross-rail and one of its saddles.

A is the cross-rail of a boring and turning mill, which is slidable vertically on uprights B, supported on a bed C.

D represents saddles which are slidable horizontally on the cross-rail A, and E represents tool-bars which are slidable crosswise of the saddles and which carry the cutting-tools.

F is the cross-rail rod, which is operatively connected with the tool-bars E, and G is the cross-rail screw, which is operatively connected with the saddles D. The rod F and screw G are provided with handles *f* and *g* at their ends or with other approved means for revolving them. The cross-rail rod F has a worm *o* splined on it, which gears into a worm-wheel *o'*, secured on the shaft O, which is journaled in the bearing *q*, supported by the saddle. A toothed pinion *p* on the shaft O gears into a toothed rack on the tool-bar E and operates to raise and lower it. The cross-rail screw G engages with a nut *s*, which is carried by the saddle.

All the above-mentioned parts are of approved construction, such as shown in the patents issued in my name, No. 569,344, dated October 13, 1896, and No. 612,783, dated October 18, 1898.

In all such large machines two persons are

required to adjust the cutting-tools when the work is comparatively small, because of the distance of the cutting-tools from the handles *f* and *g*, one person being required to watch the cutting-tools and the other to manipulate the said handles.

In order that the cutting-tools may be adjusted by one person, each saddle D has a bracket *d*, which is preferably bolted to it by screws *d'*, so as to be easily removable. A beveled toothed wheel *e* is splined to the cross-rail screw G and is provided with a hub *e'*, which is journaled in the bracket *d*. A beveled toothed wheel *h* is secured on a shaft *h'*, which is also journaled in the bracket *d* and is provided with means for revolving it, such as a handle *j*. The wheel *h* gears into the wheel *e*, so that the screw G can be revolved by turning the handle *j*. A beveled toothed wheel *k* is splined in a similar manner to the cross-rail rod F and is also journaled in the bracket *d*. A beveled toothed wheel *m* is secured on a shaft *m'* and is provided with means for revolving it similar to the shaft *h'*. The wheel *m* gears into the wheel *k*. The beveled toothed wheels and their operating-handles move with the saddle along the cross-rail and are always in convenient proximity to the tool.

What I claim is—

1. The combination, with a cross-rail, a saddle slidable thereon, an operating-shaft journaled longitudinally in the cross-rail, a worm splined on the said shaft, a tool-bar carried by the saddle, and intermediate driving mechanism connecting the said worm with the said tool-bar; of a bracket secured to the said saddle, a toothed wheel splined on the said operating-shaft and having its hub journaled in the said bracket, a shaft journaled in the said bracket and provided with means for revolving it, and a toothed wheel secured on the last said shaft and gearing into the aforesaid toothed wheel, substantially as set forth.

2. The combination, with a cross-rail, a saddle slidable thereon, an operating-screw journaled longitudinally in the cross-rail, and a nut carried by the saddle and engaging with the said screw; of a bracket secured to the said saddle, a toothed wheel splined on the said operating-screw and having its hub jour-



naled in the said bracket, a shaft journaled in the said bracket and provided with means for revolving it, and a toothed wheel secured on the last said shaft and gearing into the  
5 aforesaid toothed wheel, substantially as set forth.

3. The combination, with a cross-rail, a saddle slidable thereon, a tool-bar slidable cross-wise of the saddle, and a cross-rail screw and  
10 a cross-rail rod operatively connected with the said saddle and tool-bar respectively; of a bracket secured at one end of the said saddle, toothed driving-wheels having hubs which

are journaled in the said bracket and splined to the said screw and rod respectively, and  
15 toothed driving-wheels also supported by the said bracket and provided with means for revolving them independently and gearing respectively into the aforesaid driving-wheels,  
20 substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE WILLIAM MORETON.

Witnesses:

F. D. LEE MITCHELL,  
B. S. BROTHERHOOD.