

No. 629,042.

Patented July 18, 1899.

G. W. MORETON.
BORING AND TURNING MILL.

(Application filed Jan. 3, 1899.)

(No Model.)

2 Sheets—Sheet 1.

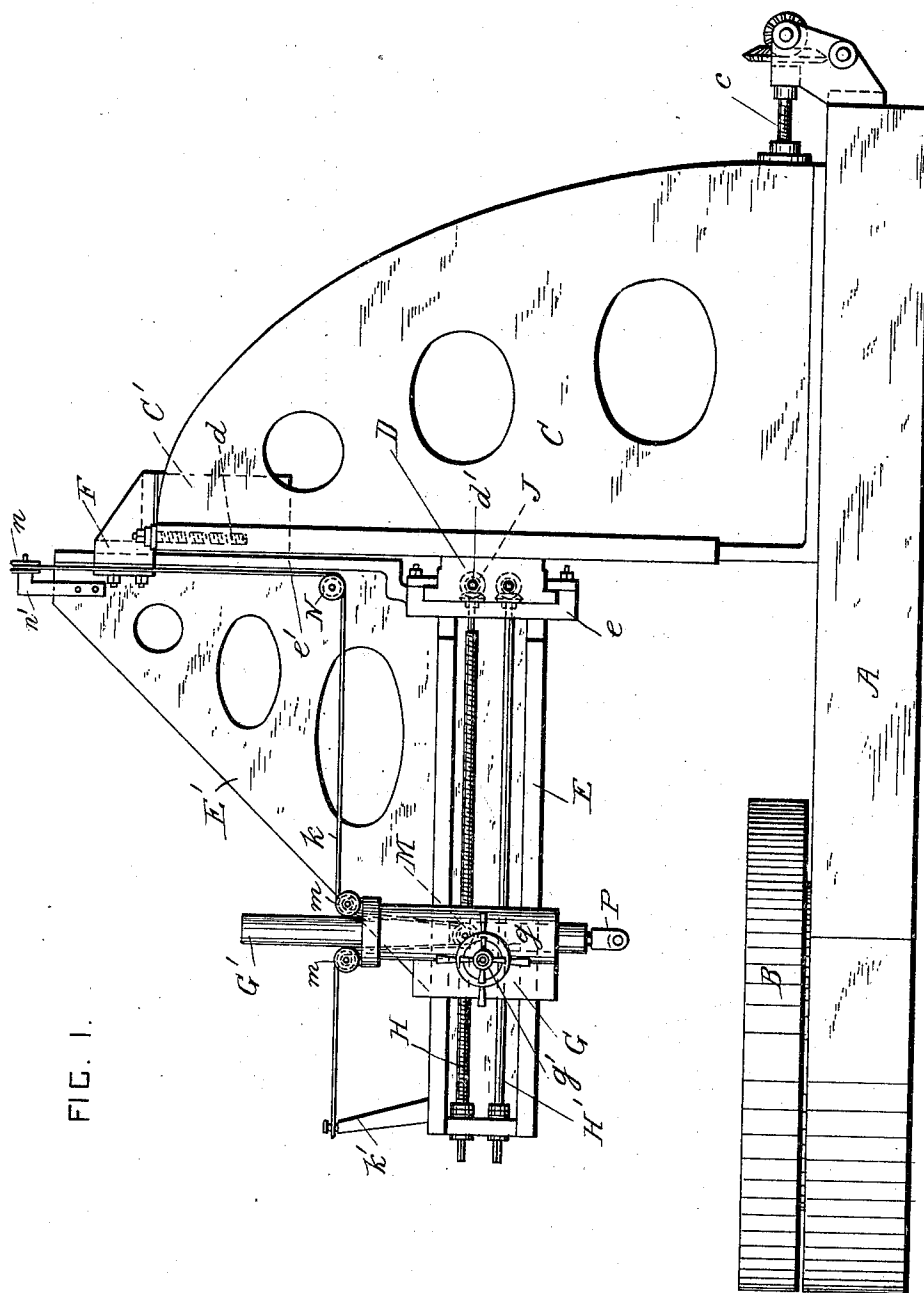


FIG. 1.

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2 Sheets—Sheet 2.

FIG. 2.

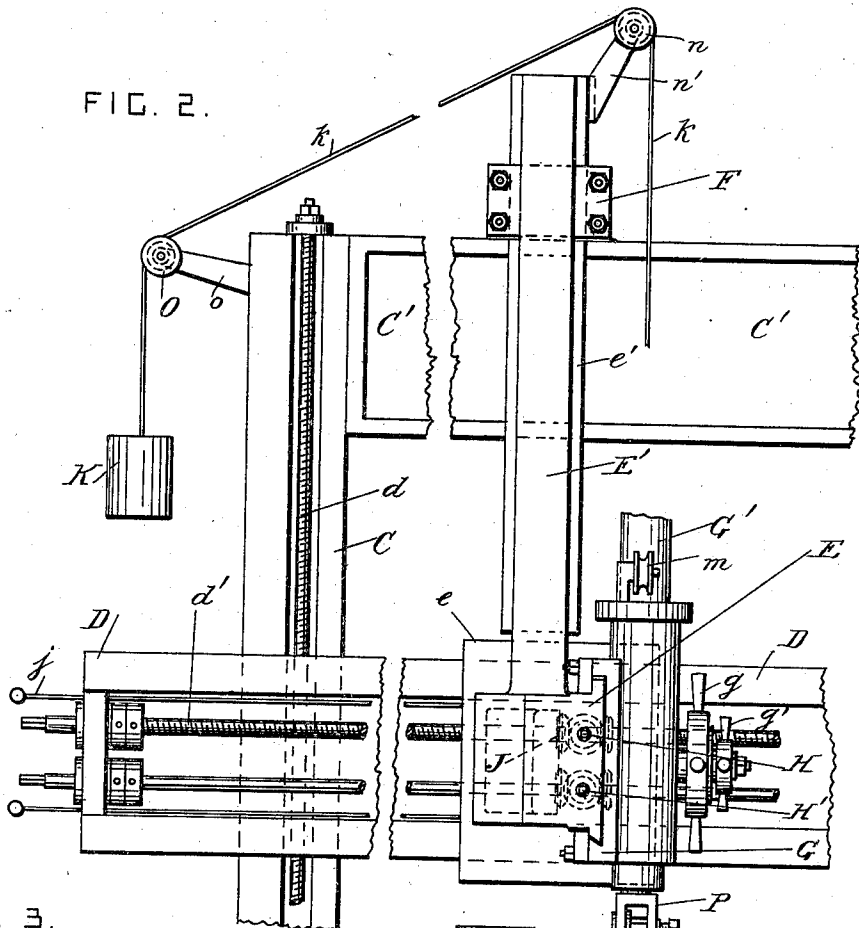


FIG. 3.

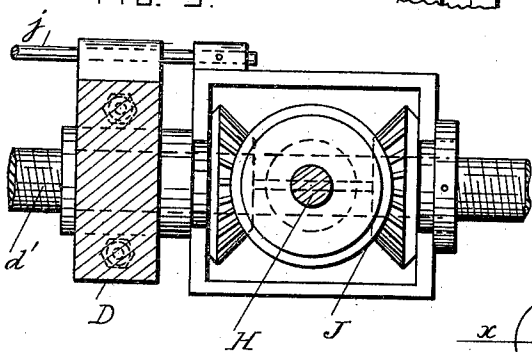


FIG. 5.

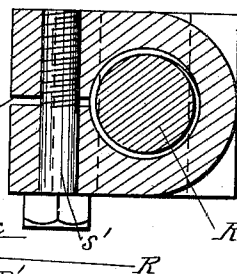
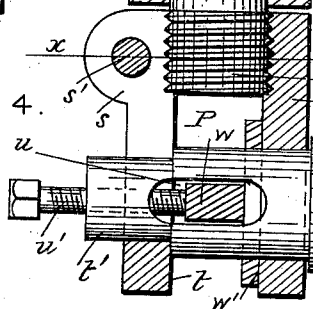


FIG. 4.



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UNITED STATES PATENT OFFICE.

GEORGE WILLIAM MORETON, OF WILMINGTON, DELAWARE, ASSIGNOR TO
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BORING AND TURNING MILL.

SPECIFICATION forming part of Letters Patent No. 629,042, dated July 18, 1899.

Application filed January 3, 1899. Serial No. 700,963. (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 New Castle 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.

In the drawings, Figure 1 is a side view of the machine. Fig. 2 is a partial front view of the machine, drawn to a larger scale. Fig. 3 is a plan view of the beveled gearing. Fig. 4 is a longitudinal section through the tool-holder. Fig. 5 is a cross-section taken on the line *x x* in Fig. 4.

A is the bed of the mill, and B is the horizontally-arranged face-plate, which revolves at the top of the bed and supports the work.

C are the uprights, which have their top portions rigidly connected by a distance-piece or girth C'. These uprights are slidable longitudinally on the bed, and *c* are screws for sliding them, two similar screws being used and revolved simultaneously by any approved driving mechanism.

D is the cross-rail for carrying the ordinary saddles and tool-slides. (Not shown.) This cross-rail is vertically slidable on the uprights C, and *d* are screws for sliding it vertically. The screws *d* are revolved simultaneously by any approved driving mechanism.

All the said parts may be of any approved construction, and the face-plate may be revolved by any approved means, such as shown in the Patent No. 569,344, dated October 13, 1896.

When a machine is constructed as set forth in the aforesaid patent, either of the ordinary tool-slides can be used for boring as long as the uprights are in their forward position and a tool-slide can be placed over the face-plate sufficiently near its center. When, however, the uprights have been moved back, as shown

in Fig. 1, to accommodate a large piece of work, the ordinary tool-slides cannot be used for either boring or for turning a horizontal surface, except to a very limited extent, because they cannot be placed sufficiently near the center of the face-plate.

According to the present invention, E is a longitudinal rail provided at one end with a saddle or socket *e* for engaging with the cross-rail D.

E' is a stiffening-piece on the upper side of the rail E, and *e'* is a vertical slide on the rear edge of the said stiffening-piece.

The rail E is arranged at about the middle part of the cross-rail D, and the slide *e'* engages with a guide F, carried by the girth C'.

The guide F is of any approved construction which will permit the rail E and its stiffening-piece to move up and down with the cross-rail D and which will permit the stiffening-piece to prevent the rail E from springing.

The longitudinal rail E is similar to a cross-rail of approved construction, and it carries a saddle G, provided with a tool-slide G' of any approved construction.

The longitudinal rail E constitutes an extension which projects from the cross-rail D and which supports the tool over the face-plate. In order that the tool may be movable radially of the face-plate, the rail E has parallel guide-surfaces upon which the saddle G is slidable.

H is a traverse-screw journaled longitudinally in the rail E and operatively connected with the saddle. H' is the feed-shaft for the tool-slide, journaled parallel to the screw H. The screw H and shaft H' may be operated by hand in a similar manner to the ordinary traverse-screw and feed-shaft of the cross-rail.

The saddle G is provided with any approved means for operating the tool-slide, such as fully described in the Patent No. 569,344, hereinbefore mentioned. *g* is its hand-wheel, and *g'* is its hand-nut for pressing together the members of its friction-clutch. The tool-slide G' is moved vertically by revolving the shaft H', and the saddle G, together with the tool-slide G', is moved hori-

zontally by revolving the shaft H'. The traverse-screw H may also be revolved from the ordinary traverse-screw d' of the cross-rail D by means of beveled toothed wheels J, as shown in Fig. 3. A rod j is slidable longitudinally in the cross-rail D and operates to place the toothed wheels in or out of operative connection with each other in any approved manner ordinarily used for the connection of driving-shafts used in the construction of machine-tools.

The traverse-screw d' traverses the ordinary saddles (not shown) back and forth on the cross-rail D and forms a driving-shaft for revolving the traverse-screw H by means of the beveled toothed wheels J. One of the said beveled toothed wheels is secured on the end of traverse-screw H, and the two beveled toothed wheels which gear with it are splined to the shaft or traverse-screw d' , upon which they have a limited sliding motion sufficient only to permit them to be slid alternately into and out of gear by means of the rod j . The shaft H' is operated in a similar manner from the ordinary feed-shaft of the boring-mill, as shown in the drawings.

The tool-slide G' is balanced by a weight K, which is attached to one end of a flexible connection k , such as a chain or cord. The other end of the flexible connection k is attached to an arm k' , projecting from the free end portion of the longitudinal rail E.

M is a pulley carried by the tool-slide, and m and m' are two pulleys supported from the saddle, one on each side of and above the pulley M.

N is a pulley carried by the lower part of the stiffening-piece E. n is a pulley carried by a bracket n' , secured to the upper part of the said stiffening-piece and arranged at an angle to the pulley N.

O is a pulley carried by a bracket o , secured to one of the uprights C. The flexible connection passes over the pulleys m , m' , n , and O and under the pulleys M and N, so that the tool-slide can be raised or lowered by itself or moved horizontally or vertically with its saddle and will be balanced in all its positions.

P is the tool-holder, provided with a tapering shank P'. This shank is rigidly secured in a socket in the tool-slide G' by means of a key p or other approved fastening device. The shank P' has a projecting screw-threaded portion R, and the tool-holder has a screw-threaded socket R', which is journaled on and engages with the screw-threaded portion R. The socket R' has a slot s on one side which splits or divides it, and s' is a clamping-screw for drawing together the divided portions of the socket, so that the tool-holder is clamped to its shank after being revolved to any desired position.

The tool-holder has a forked lower end t , and t' is the tool-post, journaled in the said forked end at a right angle to the axis of the shank P'. The tool-post has a slot u and a

set-screw u' for securing the tool-post and holding the cutting-tool w in the said slot against the washer w' on the inside of the forked end in the usual manner.

What I claim is—

1. In a boring and turning mill, the combination, with longitudinally-slidable uprights, a girth connecting their upper parts, and a cross-rail slidable vertically on the said uprights; of an extension projecting forwardly of the said cross-rail and provided with a stiffening-piece which is operatively connected with the said girth so that the free end portion of the said extension is prevented from springing, and means for supporting a tool carried by the said extension, substantially as set forth.

2. In a boring and turning mill, the combination, with longitudinally-slidable uprights, a girth connecting their upper parts, and a cross-rail slidable vertically on the said uprights; of a longitudinal rail connected at one end to the said cross-rail and provided with a stiffening-piece which is slidably connected with the said girth, substantially as set forth.

3. In a boring and turning mill, the combination, with longitudinally-slidable uprights, a girth connecting their upper parts, and a cross-rail slidable vertically on the said uprights; of a longitudinal rail connected at one end to the said cross-rail and provided with a stiffening-piece and a vertical slide on its upper side, and a guide carried by the said girth and engaging with the said slide, substantially as set forth.

4. In a boring and turning mill, the combination, with uprights, a girth connecting their upper parts, and a cross-rail slidable vertically on the said uprights; of a longitudinal rail projecting from the said cross-rail and provided with a stiffening-piece which is slidably connected with the said girth, and tool-holding mechanism carried by the said longitudinal rail, substantially as set forth.

5. In a boring and turning mill, the combination, with uprights, a girth connecting their upper parts, a cross-rail slidable vertically on the said uprights, a longitudinal rail connected at one end to the said cross-rail and provided with a stiffening-piece which is slidably connected with the said girth, and tool-holding mechanism carried by the said longitudinal rail; of a shaft journaled longitudinally of the said longitudinal rail and operatively connected with the said tool-holding mechanism, a driving-shaft journaled longitudinally of the said cross-rail, and driving mechanism connecting the two said shafts, substantially as set forth.

6. In a boring and turning mill, the combination, with uprights, a girth connecting their upper parts, and a cross-rail slidable vertically on the said uprights; of a longitudinal rail connected at one end to the said cross-rail and provided with a stiffening-piece slidably connected with the girth, a saddle slidable along the said longitudinal rail, a tool-

slide slidable vertically in the said saddle, a series of guide-pulleys supported respectively from one of the uprights, the stiffening-piece, the saddle and the tool-slide, a flexible connection connected at one end with the free end portion of the longitudinal rail and engaging with the said pulleys, and a weight attached to the free end of the said flexible

connection and counterbalancing the tool-slide, substantially as set forth.

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

GEORGE WILLIAM MORETON.

Witnesses:

KENT H. DILLON,
JOHN W. PEREGOY.