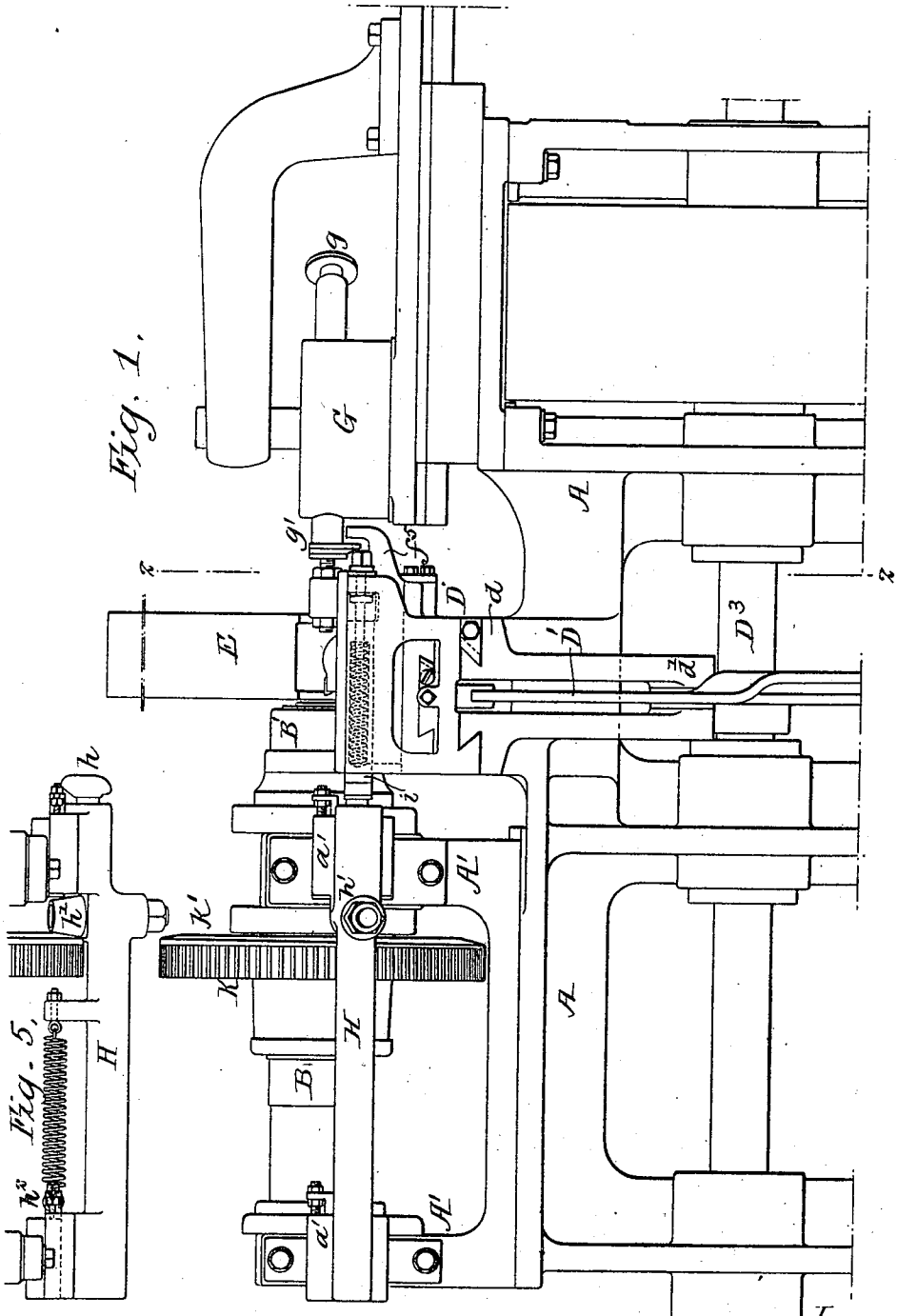
No. 666,486. Patented Jan. 22, 1901.

J. W. BROWN, JR.

AUTOMATIC BORING MACHINE.

(Application filed Apr. 11, 1900.)

(No Model.) 4 Sheets—Sheet 1.



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John Wilson Brown Jr.
by his Attorneys:-
Howson & Howson

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

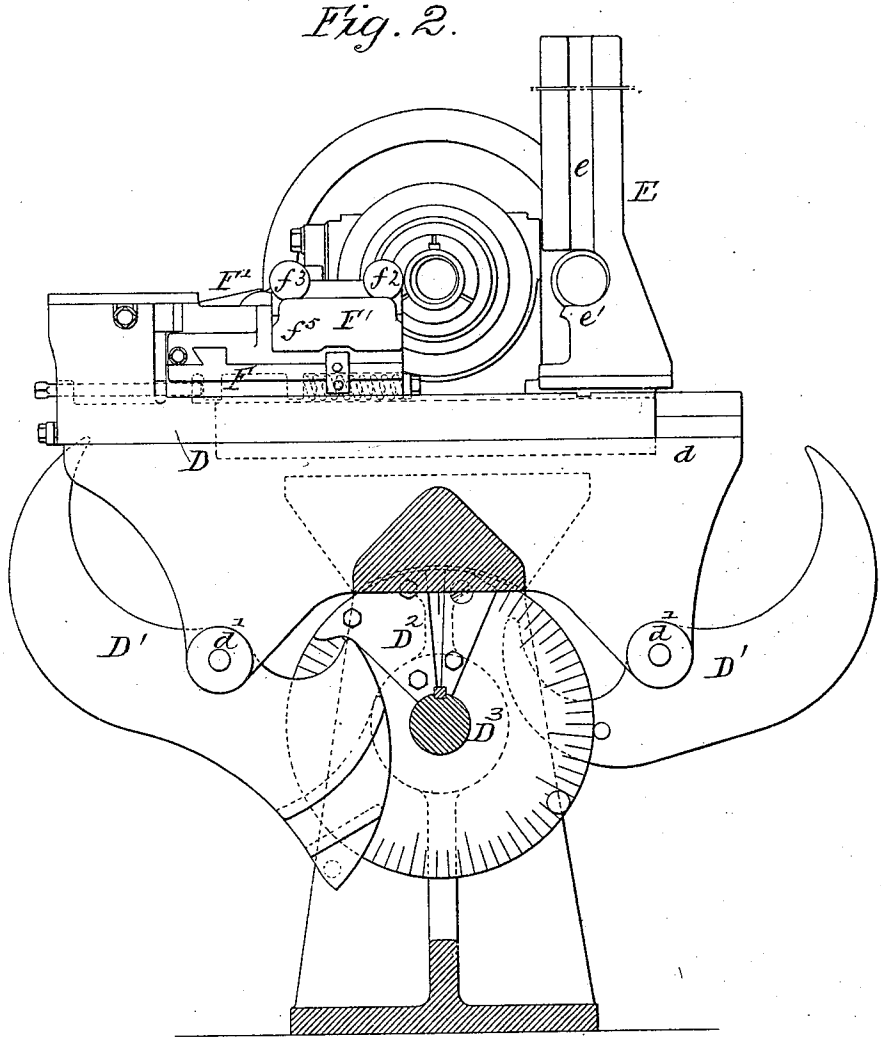
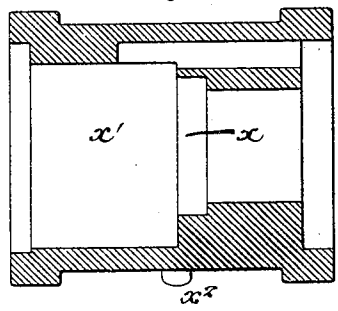


Fig. 6.



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(No Model.) 4 Sheets—Sheet 3.

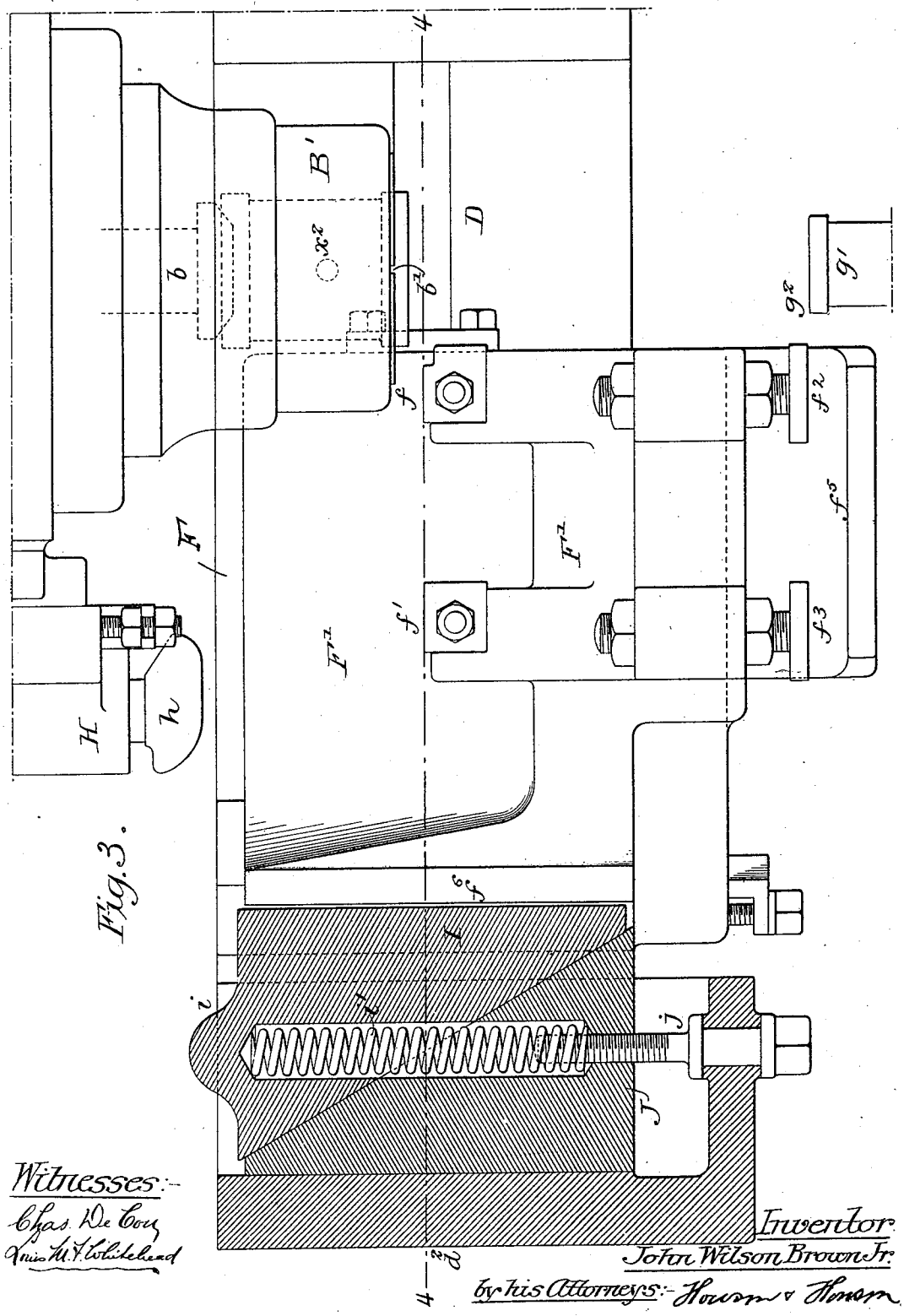


Fig. 3.

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(Application filed Apr. 11, 1900.

(No Model.) 4 Sheets—Sheet 4.

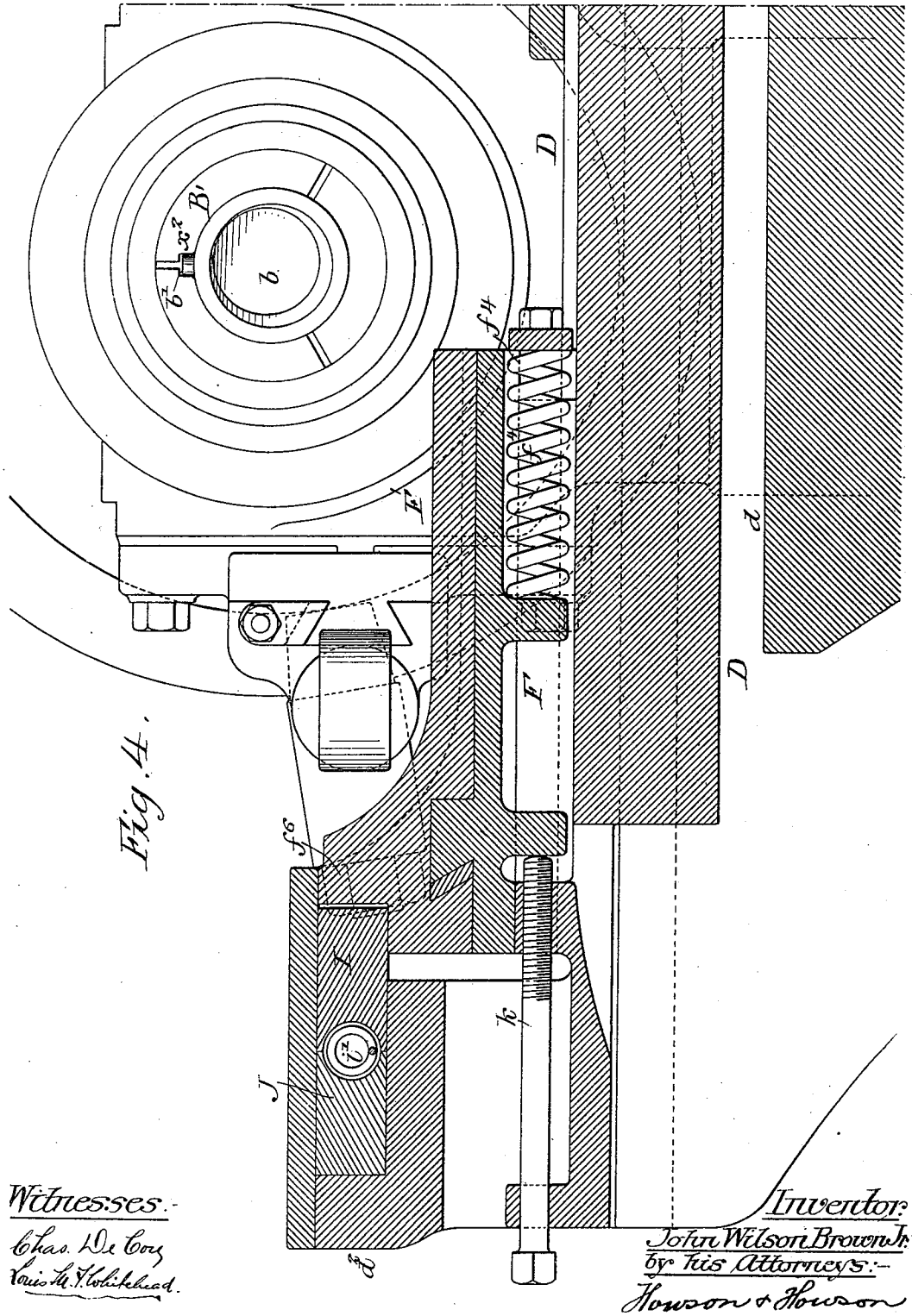


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN WILSON BROWN, JR., OF PHILADELPHIA, PENNSYLVANIA.

AUTOMATIC BORING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,486, dated January 22, 1901.

Application filed April 11, 1900. Serial No. 12,479. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILSON BROWN, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Automatic Cutting or Boring Machines, of which the following is a specification.

My invention relates to certain improvements in machines for automatically boring or cutting irregular objects. In machines of this type the articles to be bored or cut are placed in a hopper and are automatically fed to the machine and chucked therein. The necessary cuts are then made and the article is released and another article is fed from the hopper automatically.

In the accompanying drawings, Figure 1 is a side view of an automatic boring or cutting machine to illustrate my invention. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is an enlarged sectional plan view. Fig. 4 is a section on the line 4 4, Fig. 3. Fig. 5 is a plan view of a portion of Fig. 1, and Fig. 6 is a view of one of the articles bored on this machine.

My invention is applied to one form of an automatic screw-machine, and I have shown in the drawings only those parts of the machine that are directly connected with the invention.

The invention relates to the mechanism for feeding the article to the chuck and the mechanism for making a concentric cut and an eccentric cut in the article while chucked.

I have shown in Fig. 6 of the drawings a view of one of the articles which this machine is especially designed to cut, although it will be understood that the articles may be varied without departing from my invention. In order that the machine can be readily understood, I would state that the figure illustrates the barrel of a rotary pump. The portion x of the barrel is concentric, while the portion x' is eccentric. The machine I will proceed to describe bores the concentric portion and then bores the eccentric portion, so that the interior of the barrel is finished by the one machine without rechucking.

A is the base of the machine.

A′ represents the bearings for the chuck-shaft B. On the chuck-shaft is a gear-wheel K, which meshes with gears on a driving-shaft. On the end of the shaft B is the chuck proper, B′, which chuck is hollow and is adapted to receive the piece to be cut, as shown in Fig. 4, these chucks being usually made with means for locking the piece to the chuck, so that it must turn with the chuck, and the piece has usually a lug or projection which enters a recess in the chuck, so that each piece will bear the same relation to the chuck and cutting mechanism.

Mounted in front of the chuck is a carriage D, adapted to tranverse ways d. On one end of the carriage D is a hopper E, in which the articles are placed one above another, and at the opposite end of the carriage is a slide-rest F. The carriage D is moved across the machine by the ordinary arms D′, pivoted at d' to the frame of the machine and actuated by a cam D^2 on the operating-shaft D^3. This operating-shaft is controlled by any suitable mechanism for giving it a rotary motion at a given time. The hopper E consists of a vertical chamber e, open in front, and directly below the chamber is a rest e' for the lowermost article.

b is an ejector operating in the chuck B′, in which there is a slot or recess b' for a use described hereinafter. The ejector mechanism is constructed and operated as fully set forth in the application of Brown and Shellenbach, Serial No. 25,674, filed August 2, 1900. Opposite the ejector and on the same level is a plunger g, supported on a turret G, the whole being constructed and automatically operated by any of the well-known methods commonly used in this form of apparatus.

The slide-rest F can move longitudinally on the carriage D, and mounted on ways on said slide-rest F is a tool-slide F′, carrying the two cutters $f f'$, the two adjustable abutments f^2 f^3, and a lip f^5. The cutters may be of any suitable shape, according to the work to be performed, and are detachably secured to the slide F′, as shown in Fig. 3. The head g^2 of the turret-plunger g' extends between the abutments and the lip f^5 of the tool-slide F′, so that the turret not only moves the tool-slide F′ forward, but also returns it, dispensing with a spring.

Resting between a flange d^2 on the carriage D and a flange f^6 on the tool-slide F′ are two wedges J and I. The wedge J rests against

the flange d^2 and can be adjusted by means of a screw j. The wedge I moves on the wedge J and is forced out by means of a spring i', mounted in a socket in each wedge, as shown in Fig. 3. The wedge I is forced in by a slide H, described hereinafter. As the wedge I is forced in it moves the slide F forward against the pressure of a spring f^4, which as soon as the slide is relieved forces it against the stop-screw k. This screw is so adjusted as to allow the wedge I to clear the slide, as shown in Fig. 4.

By manipulating the screw k the size of the circular portion x of the article to be cut can be varied, and by manipulating the screw j the size of the eccentric portion can be varied.

The slide H, which actuates the wedge I, is mounted on ways a' on the bearings A' for the spindle B, and secured to or forming part of the gear-wheel K is a cam k'. This cam acts upon the roller h' on the slide H. A spring h^2 tends to keep the roller in contact with the cam, so that as the cam rotates the slide will be moved in and out.

The slide H is reciprocated during the operation of the machine, only acting upon the wedge I when its head i is in line with the head h of said slide. When in this position, it will move the wedge forward against the pressure of the spring i'.

The operation of the machine is as follows: The machine is set for cutting a certain article—say, for instance, the pump-barrel shown in Fig. 6. The barrels in the rough are placed one upon another in the hopper. The first movement of the carriage D is to bring the hopper E in line with the chuck. The elements g and b grasp the article and the hopper recedes. Then the article is moved toward the chuck, and when the lug x^2 on the article is in line with the recess b' of the chuck the article is forced into the chuck. The turret then recedes and turns until its plunger g' is in line with the chuck, and the carriage D is moved so that the cutter will be in position to cut the concentric inner surface x of the article. The tool is gradually pushed into the article as it cuts by the turret G, its plunger g' pushing against the abutment f^2. When the cut has been made, the tool-slide F' is returned by the head g^2 on the plunger g' engaging the lip f^5. When the tool is clear, the carriage is again moved forward and also given a transverse movement until the cutter f' is in position to cut the eccentric surface of the article. The head of the wedge I is then in line with the head h of the slide H and the abutment f^3 is in line with the plunger g'. As the plunger g' moves forward it forces the cutter f' into the article. At the same time motion is imparted to the wedge I by the reciprocating slide H, and this motion is imparted to the slide F and tool-slide F', and thus the cutter f' moves toward and from the center of the chuck as the article is turned, accurately cutting the eccentric portion. As soon as the cut is made the cutter is withdrawn and the article is discharged from the chuck by the ejector b.

It will be seen that all that is necessary is to set the machine to the article to be bored, to keep the hopper loaded, and the cutters in good condition and the machine will automatically chuck the articles, cut both their concentric and eccentric surfaces, and discharge them when finished.

While I have described my invention as cutting a particular piece, it will be understood that it can be set to cut different articles and will cut either the interior surface, as described, or the exterior surface.

I claim as my invention—

1. The combination in a machine for cutting concentric and eccentric shapes, of means for holding and rotating the article to be cut, two cutting-tools, a carrier therefor, means for feeding the tool-carrier to cut the concentric portion, and means for imparting a longitudinal and lateral motion to the tool-carrier to cut the eccentric portion, substantially as described.

2. The combination in an automatic lathe, of a chuck, means for rotating the chuck, a slide carrying cutters, a turret, a plunger on said turret constructed to move said slide longitudinally on the lathe and means for simultaneously giving a transverse motion to the slide while one of said cutters is in action, substantially as described.

3. The combination of a chuck, a slide carrying two cutters, means for feeding the cutters forward to make a cut, with means for moving first one cutter in line to make a cut and then another cutter in line to make another cut and means for giving said slide an independent lateral motion while one of the cutters is working, substantially as described.

4. The combination of means for holding and rotating the article to be cut, a cam, a slide actuated by the cam, a transverse slide carrying two cutters, means for forcing first one cutter and then the other cutter against the article to be bored, a wedge acting on the slide, said wedge when moved into position so that the second cutter will act being in line with the slide actuated by the cam, so that the cutter will be given a lateral motion independent of the forward feed, substantially as described.

5. The combination of means for holding and rotating the article to be cut, a carriage transversely movable in respect to the article, said carriage having a hopper and a slide, two cutters carried by the slide, a turret, means for actuating the turret, a wedge carried by the slide, a longitudinal slide on ways on the fixed part of the machine, a cam for actuating said slide so as to move the wedge, and a spring for retracting the wedge, substantially as described.

6. The combination in means for holding and rotating articles to be cut, a carriage transversely movable in respect to the article, a slide on said carriage, a tool-slide on the

slide, tools carried by the tool-slide, means for moving the tool-slide longitudinally, two wedges between the slide and the carriage, means for adjusting one of said wedges, and means for operating the other wedge during the time the slide is fed forward, substantially as described.

7. The combination with means for holding and rotating the article to be cut, of a transversely-movable carriage, a slide mounted thereon and also movable transversely, a tool-slide movable longitudinally on said slide, tools carried by the tool-slide, means for automatically moving the said tool-slide, means for moving the slide forward and an adjustable stop on the carriage for the slide, substantially as described.

8. The combination of means for holding and rotating the article to be cut, a slide, tools carried thereby, a headed plunger adapted to feed the tools forward, and a flange on the slide engaged by the headed plunger as it recedes, substantially as described.

9. The combination of a chuck for rotating the article to be cut, a transversely-movable carriage, a hopper on one end of the carriage and a slide on the opposite end, a tool-slide carried by the slide, a tool thereon, means for operating the carriage, means for feeding the tool longitudinally, and means for reciprocating the tool transversely as the chuck revolves, substantially as described.

10. The combination of a chuck for rotating the article to be cut, a transversely-movable carriage, a hopper on one end of the carriage and a slide on the opposite end, a tool-slide carried by the slide, a tool thereon, means for operating the carriage, means for feeding the tool longitudinally, and means for reciprocating the tool transversely at each revolution of the chuck, substantially as set forth.

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

JOHN WILSON BROWN, JR.

Witnesses:

WILL. A. BARR,

JOS. H. KLEIN.