(No Model.)

2 Sheets—Sheet 1.

J. W. BROWN, Jr.

AUTOMATIC CHUCKING LATHE.

No. 579,357. Patented Mar. 23, 1897.

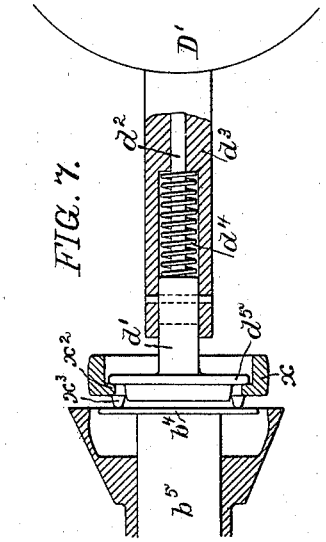

FIG. 7.

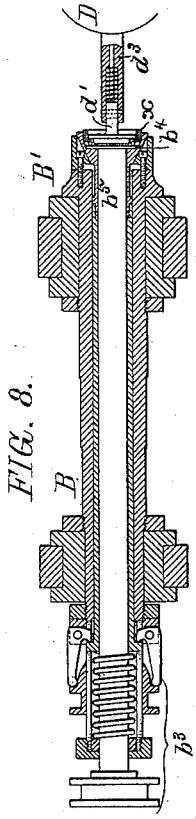

FIG. 8.

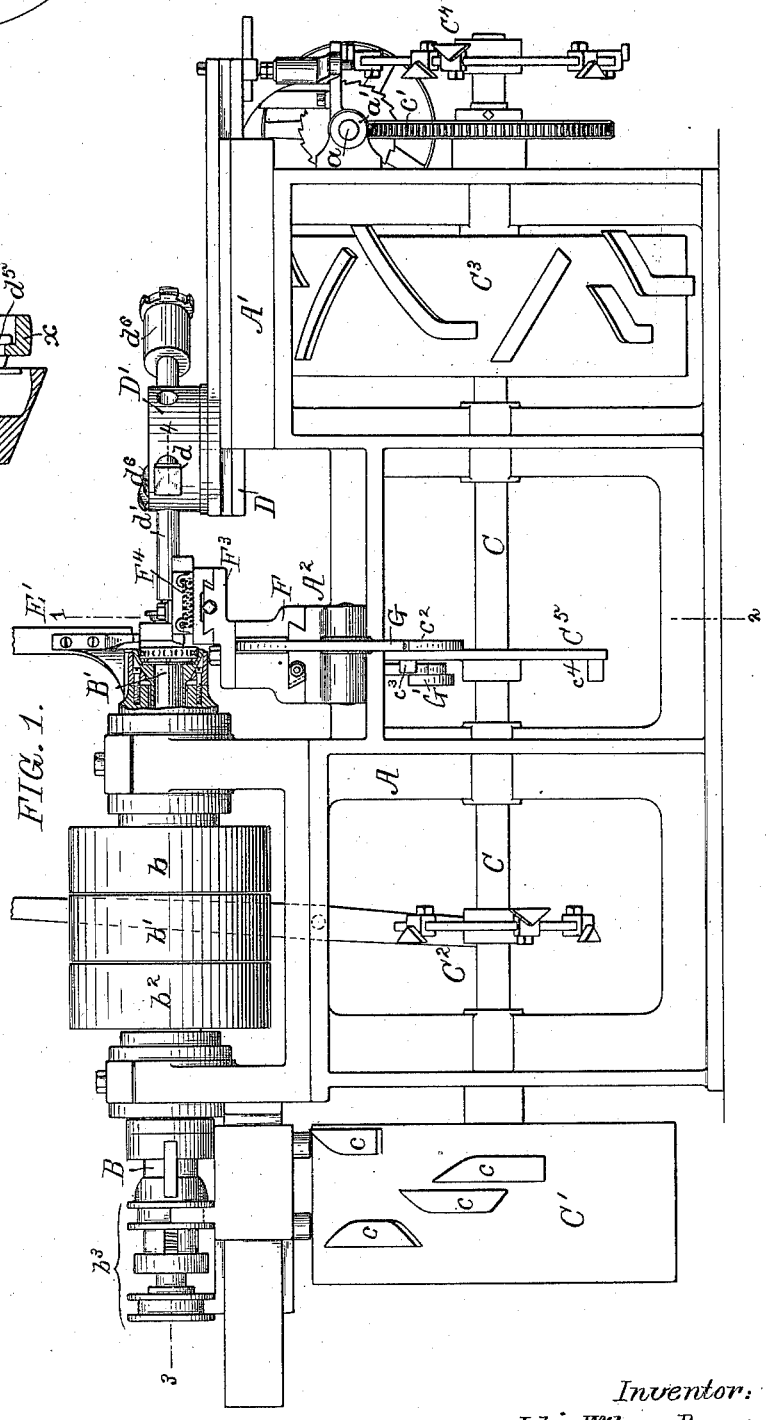

FIG. 1.

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R. Schleicher.

Inventor:
John Wilson Brown Jr.
By his Attorneys
Howson & Howson

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

(No Model.) 2 Sheets—Sheet 2.

J. W. BROWN, Jr.

AUTOMATIC CHUCKING LATHE.

No. 579,357. Patented Mar. 23, 1897.

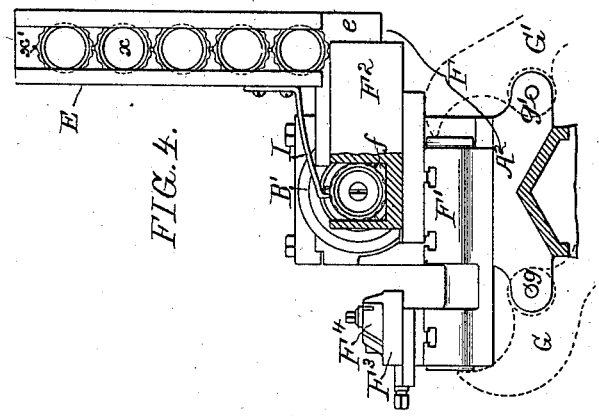

FIG. 4.

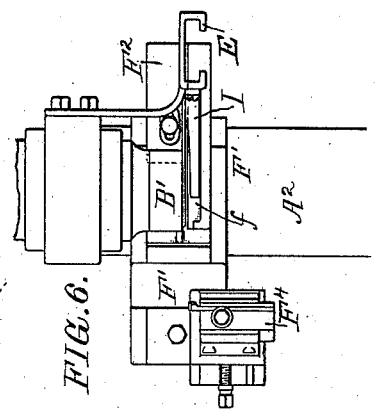

FIG. 6.

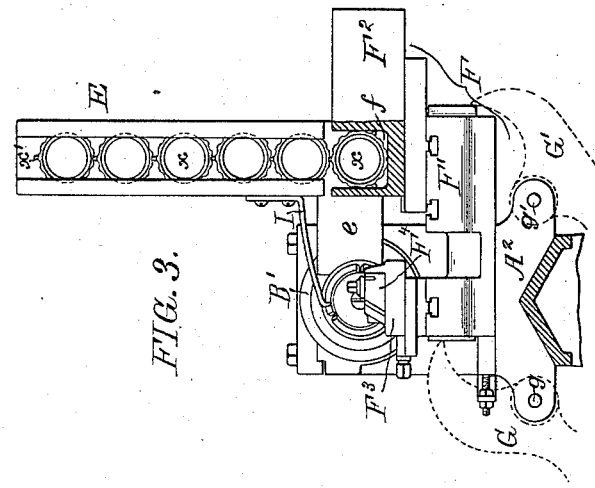

FIG. 3.

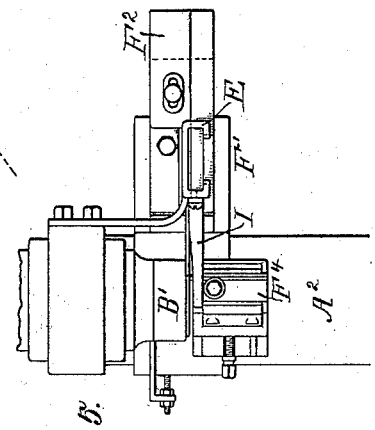

FIG. 5.

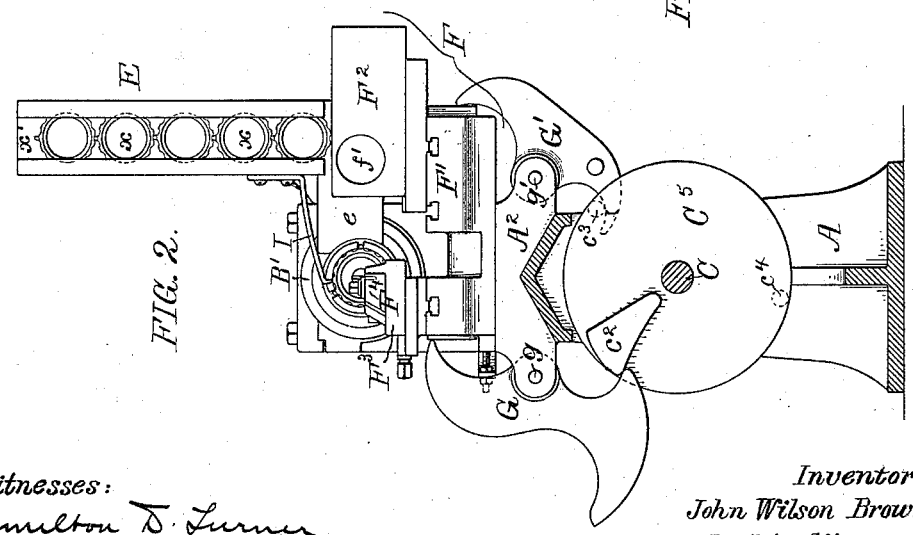

FIG. 2.

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

UNITED STATES PATENT OFFICE.

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

AUTOMATIC CHUCKING-LATHE.

SPECIFICATION forming part of Letters Patent No. 579,357, dated March 23, 1897.

Application filed June 7, 1893. Serial No. 476,806. (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 Chucking-Lathes, of which the following is a specification.

My invention relates to improvements in machines for turning, drilling, or tapping metallic pieces which are automatically fed to the machine. Machines of this class are commonly known as "automatic turret-lathes."

The object of my invention is to so construct a machine that eccentric pieces can be fed automatically to the machine and turned, drilled, or tapped.

I include in the word "eccentric" all pieces that have not a true concentric periphery. If, for instance, a ring has projections on it, although the main portion of the ring is concentric, the projections would bring it under the term "eccentric."

Referring to the accompanying drawings, Figure 1 is a side view, partly in section, illustrating my invention as applied to the ordinary turret-lathe. Fig. 2 is a transverse section on the line 1 2, Fig. 1. Figs. 3 and 4 are views showing the parts in different positions. Figs. 5 and 6 are plan views of portions of the machine shown in Figs. 3 and 4. Fig. 7 is a view of the plunger; and Fig. 8 is a longitudinal section on the line 3 4, Fig. 1.

I will briefly describe the turret-lathe shown in Fig. 1, although the lathe is of the ordinary construction.

A is the frame, mounted in bearings, in which is the shaft B, carrying the chuck B', which must be shaped to accommodate the article to be turned. On the shaft B are the fast and loose pulleys b b' b^2. The chuck-operating mechanism b^3 is controlled by the cam-lugs c on the cam-wheel C', mounted on the cam-shaft C, having its bearings in the frame A. On this shaft is the belt-shifter cam C^2, the cam C^3 for reciprocating the turret-slide D, the fast and slow feed shifting-cam C^4, and the piece-feeding cam C^5. The shaft C is driven from a driving-shaft a, having a worm a', meshing with a worm-wheel c' on the shaft C. The cam-disk C^5 controls the movement of the feeding device for the pieces and the slide-rest. Thus it will be seen that as the shaft C slowly revolves, the several cams on the shaft being timed, it throws into operation the different parts of the machine at the proper moment, so as to automatically feed, clamp, turn, and, if necessary, drill and screw-thread the pieces and release them when finished.

Prior to my invention it has only been possible to automatically feed concentric pieces in machines of this character, but by the improvements which I will now proceed to describe I am enabled to automatically feed eccentric pieces of almost any shape.

Mounted at one side of the chuck B', in the present instance, is a vertical hopper E, preferably open in front and of a size so as to properly confine the pieces x to be operated upon. These pieces in the present instance are rings having corrugations on the periphery and having one or more lugs x' on the periphery, as well as lugs x^3 on one face. These rings have to be turned and screw-threaded on the inside, and the machine shown in the drawings turns the rings and screw-threads them. Directly below the hopper E is a reciprocating slide F, having a pocket f to receive one of the rings, as shown in Fig. 3. This slide in the present instance is composed of the slide proper, F', mounted on the portion A^2 of the frame A, and the adjustable head F^2, in which is formed the pocket f. The head F^2 can be adjusted on the slide proper, F', and can be removed when a different piece is to be turned.

Carried by the slide F' is a slide-rest F^3, on which is mounted the tool-post F^4, and the slide-rest moves with the slide F', so as to bring the tool in cutting position in front of the chuck, as shown in Fig. 3.

On the turret D' is a plunger d', which is moved in line with the tool when it is in cutting position, and as the turret-slide D moves forward the plunger will force the cutting-tool into the ring to be cut, and as the plunger is retracted the tool will be withdrawn by a spring or weight.

The slide F' is controlled by the cam-disk C^5, having cam-lugs on its face, as shown in

Figs. 1 and 2. The cam-lug c^2 acts upon the lever G, pivoted at g to a portion A^2 of the frame, and the lugs c^3 and c^4 act upon the lever G′, pivoted to the portion g' of the frame. The lever G′ moves the slide so as to transfer a piece from the hopper into position in front of the chuck and to move the slide-rest back, while the cam G moves the slide-rest forward and returns the slide, so that the pocket can receive another piece.

The head F^2 has an opening f' directly in front of the pocket f and is open at the back, so that the piece can be forced out of the pocket and into the chuck. The opening f' is of sufficient size to admit the plunger d' on the turret D′.

Extending from the base of the hopper E to the chuck is a plate e, which closes the rear of the pocket f during the travel of the slide from the position shown in Fig. 3 to the position shown in Fig. 4.

When the slide reaches the position shown in Fig. 4, the piece is engaged by a detent I, secured in the present instance to the hopper and in the form of a spring, so that the piece will not turn with the chuck until it is within its jaws. Other forms of detents may be used without departing from my invention.

It will be understood that when the piece moves past the plate e and assumes a position in front of the chuck it bears against the face of the chuck and would be turned by the chuck, owing to frictional contact, but by providing the detent it is kept from turning, and at the proper time, when its projections aline with the cavities in the chuck to receive them, the spring-plunger on the turret will force the piece into the chuck, the projections entering their respective cavities. This movement of the plunger frees the piece from the control of the detent.

The cams are so timed that the pocket f will be returned and the slide-rest will be moved in front of the chucked piece and will be so operated by the combined movement of the cam C^5 and the cams controlling the turret-head as to properly turn a portion of the interior of the ring, after which the slide-rest is moved about half-way, so that the tap d^6, carried by the turret, can enter the ring and tap a screw-thread therein, after which the parts are so operated as to allow the chuck to release the finished piece.

The plunger d', as shown in Fig. 7, is spring-seated, being reduced at d^2. A spring d^4 is mounted between a shoulder on the plunger d' and a shoulder on the fixed portion d^3, adapted to the turret-head D′. The head d^5 of the plunger d' passes through the opening f' in the slide and rests against the flange x^2 of the piece x. The projections or lugs x^3 on the face of the piece x rest against the plate b^4, carried by a cam-controlled stem b^5, Fig. 7, which is so actuated as to discharge the piece from the chuck when finished.

The head or plate b^4 when the piece is not in the chuck moves forward until it is flush with the face of the chuck, as shown in Fig. 7, giving a good bearing for the piece when it is moved in front of the chuck. When the spring-plunger is forced into the pocket, it clamps the piece between its head d^5 and the plate b^4, and when the notches of the chuck aline with the projections on the piece the plungers carry the piece into the chuck.

The special feeding mechanism is not absolutely necessary, although preferable, as the plunger may carry the piece to the chuck, and in some cases the feeding mechanism may be combined with the turret mechanism.

I claim as my invention—

1. In a lathe for turning eccentric pieces, the combination of the revolving chuck for positively grasping the piece to be turned, a feeding device for feeding the piece to the position in front of the chuck, a detent engaging with the piece and preventing it from turning when in frictional contact with the chuck, with mechanism for forcing the piece into the chuck so that it will be positively engaged thereby, substantially as described.

2. In a lathe for turning eccentric pieces, the combination of the revolving chuck by which the piece is positively held, a feeding device for feeding the piece to a position in front of the chuck, a detent adapted to engage with the piece and prevent it from turning with the chuck when in frictional contact therewith, with a plunger tending to force the piece into the chuck so that when the piece registers with the chuck it will be positively engaged thereby and will be freed from the detent, substantially as described.

3. The combination in a lathe for turning eccentric pieces of the chuck by which the piece is held, the feeding device for feeding the piece to a position in front of the chuck, a spring-detent engaging with the piece whereby it is prevented from turning when in frictional contact with the chuck, and a plunger for forcing the piece from the control of the detent and into positive engagement with the chuck.

4. The combination in a lathe for turning eccentric pieces, of the revolving chuck, the hopper, the reciprocating carrier for conveying the piece from the hopper to a position in front of the chuck, a spring-detent engaging with the piece and preventing it from turning, with a plunger for forcing the piece into the chuck and from under the control of the detent, substantially as set forth.

5. The combination in a lathe for turning eccentric pieces, of the revolving chuck, the feeding mechanism for feeding the pieces in front of the chuck, a detent engaging with the pieces preventing them from turning, with a spring-seated plunger, for forcing the pieces into the chuck and from under the control of the detent, substantially as specified.

6. The combination of the revolving chuck, a reciprocating slide a piece-feeding device carried by said slide, a slide-rest also carried by the slide, a cam for controlling the transverse movement of the slide-rest and a turret-plunger controlling the longitudinal movement of the tool, 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:

WILLIAM A. BARR,

JOSEPH H. KLEIN.