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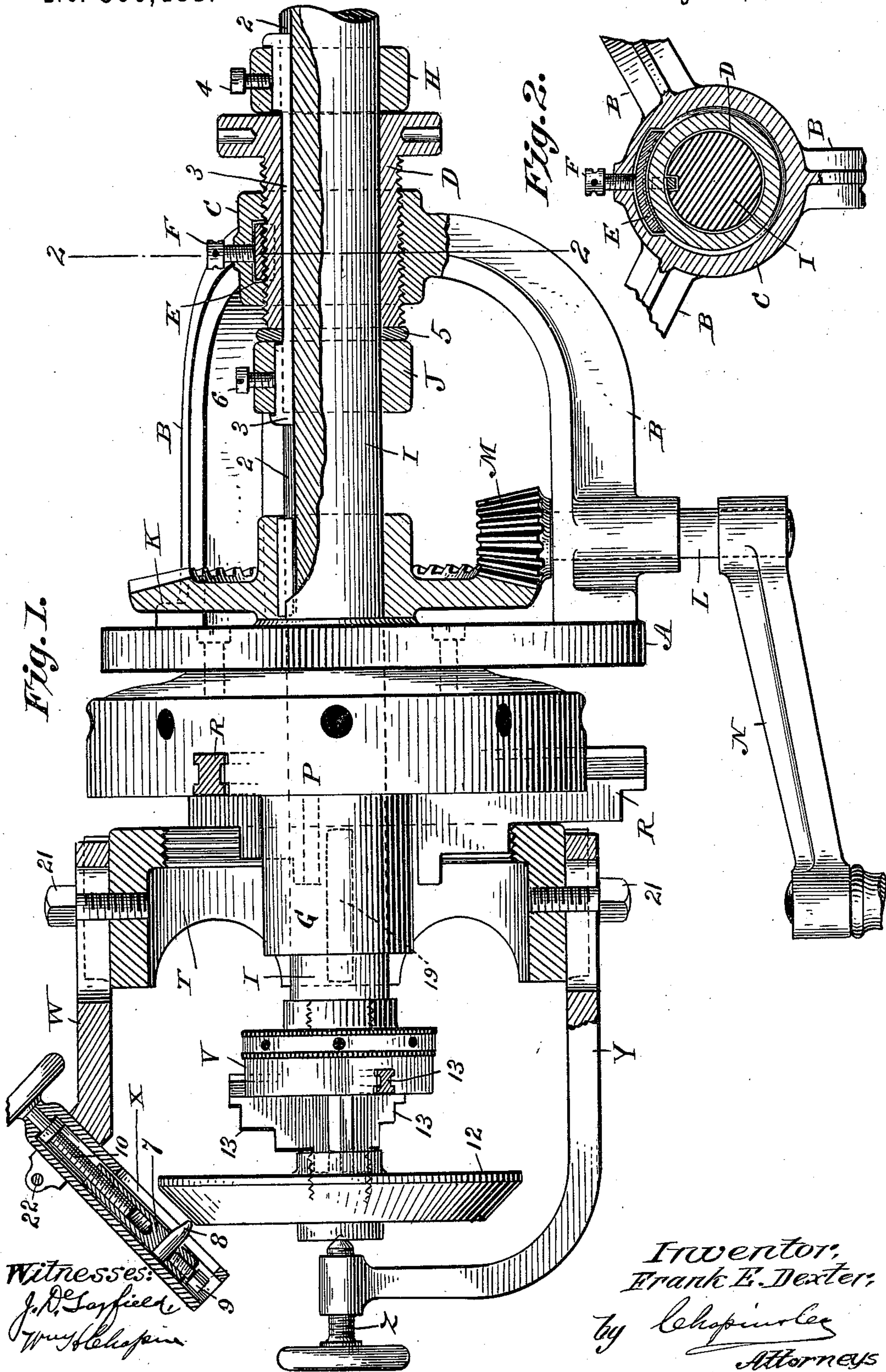
3 Sheets—Sheet 1.

F. E. DEXTER.

MACHINE FOR REPAIRING VALVES AND VALVE SEATS.

No. 560,481.

Patented May 19, 1896.



Witnesses:  
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(No Model.)

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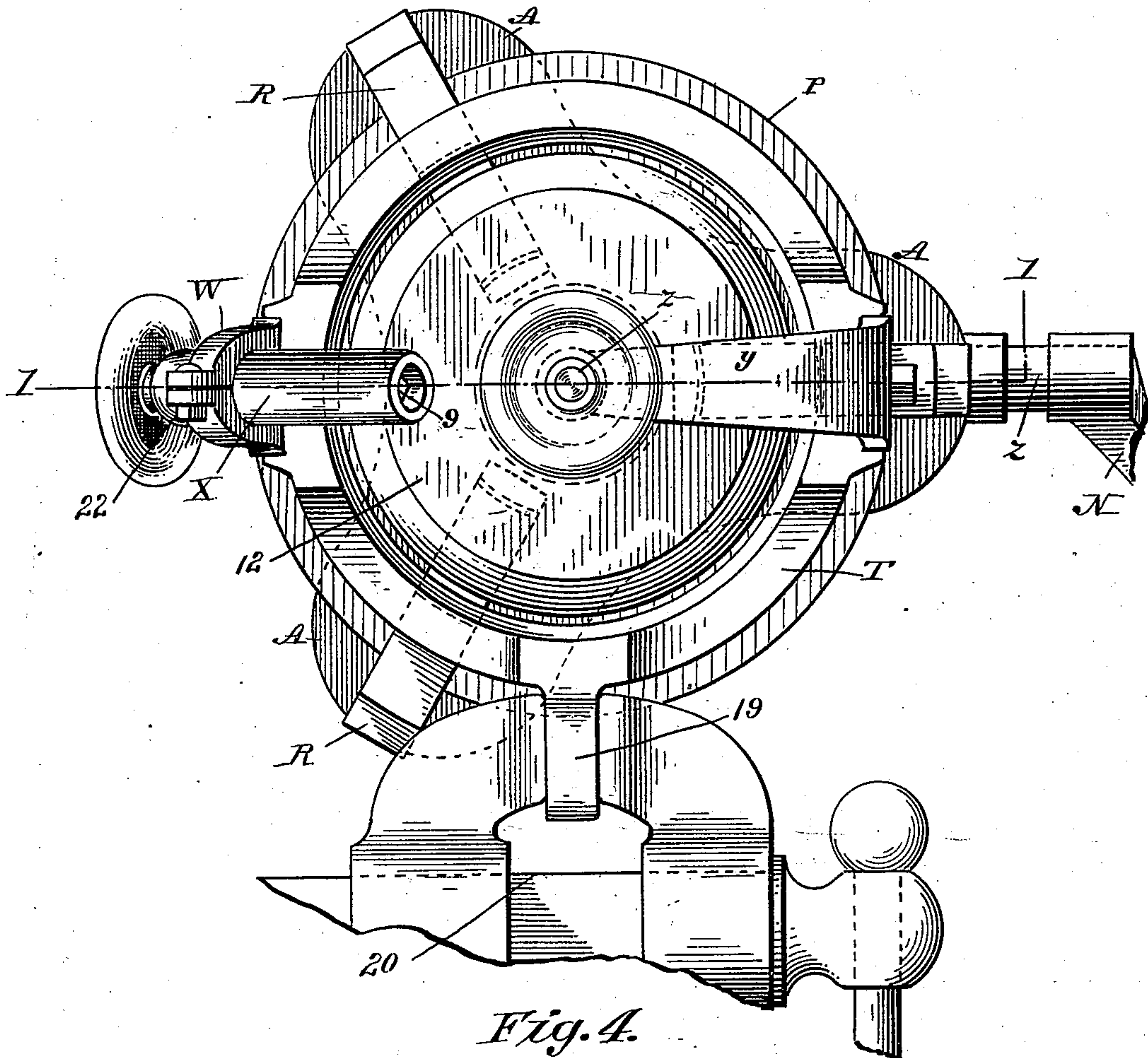
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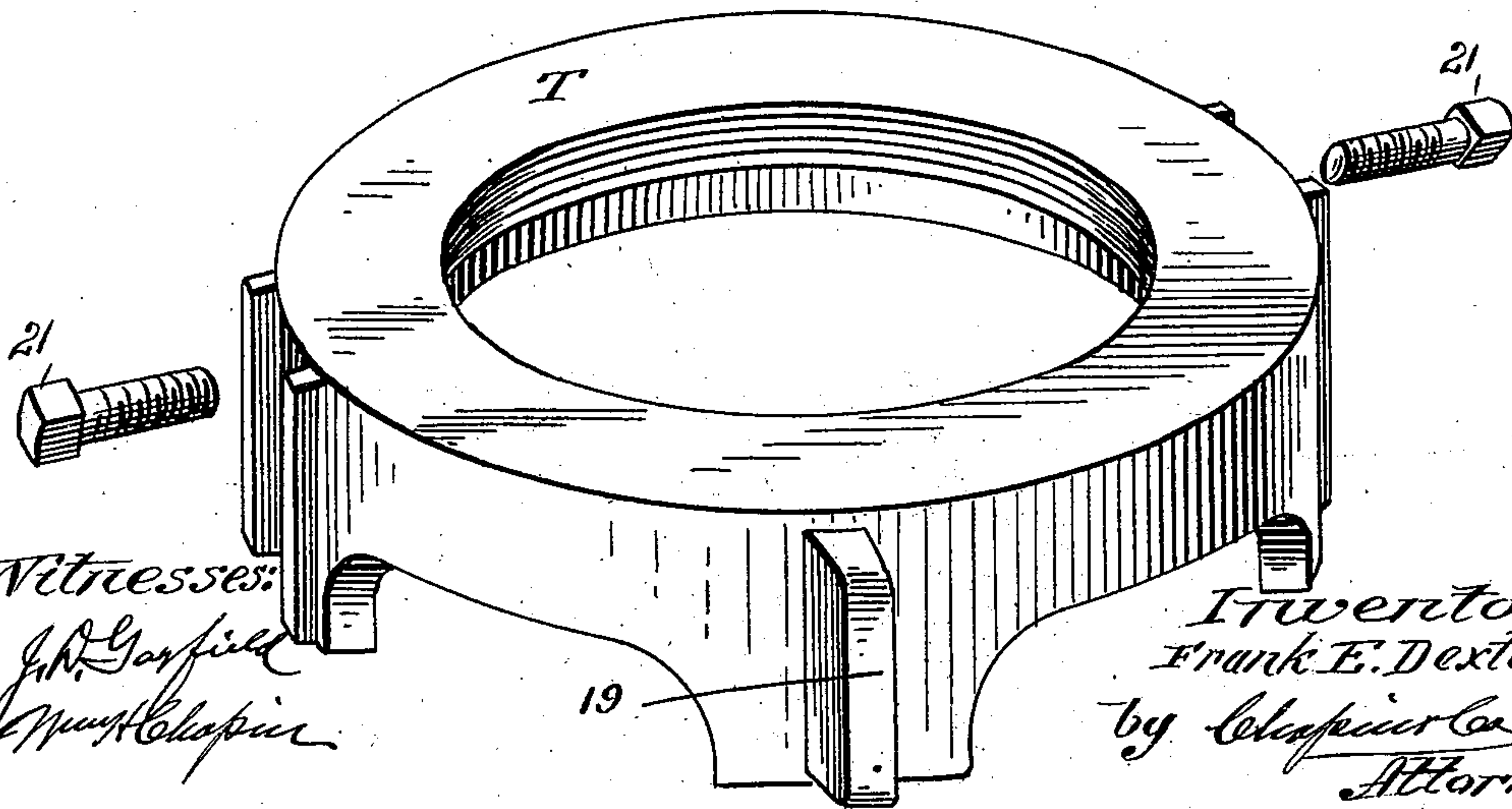
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*Fig. 3.*



*Fig. 4.*



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(No Model.)

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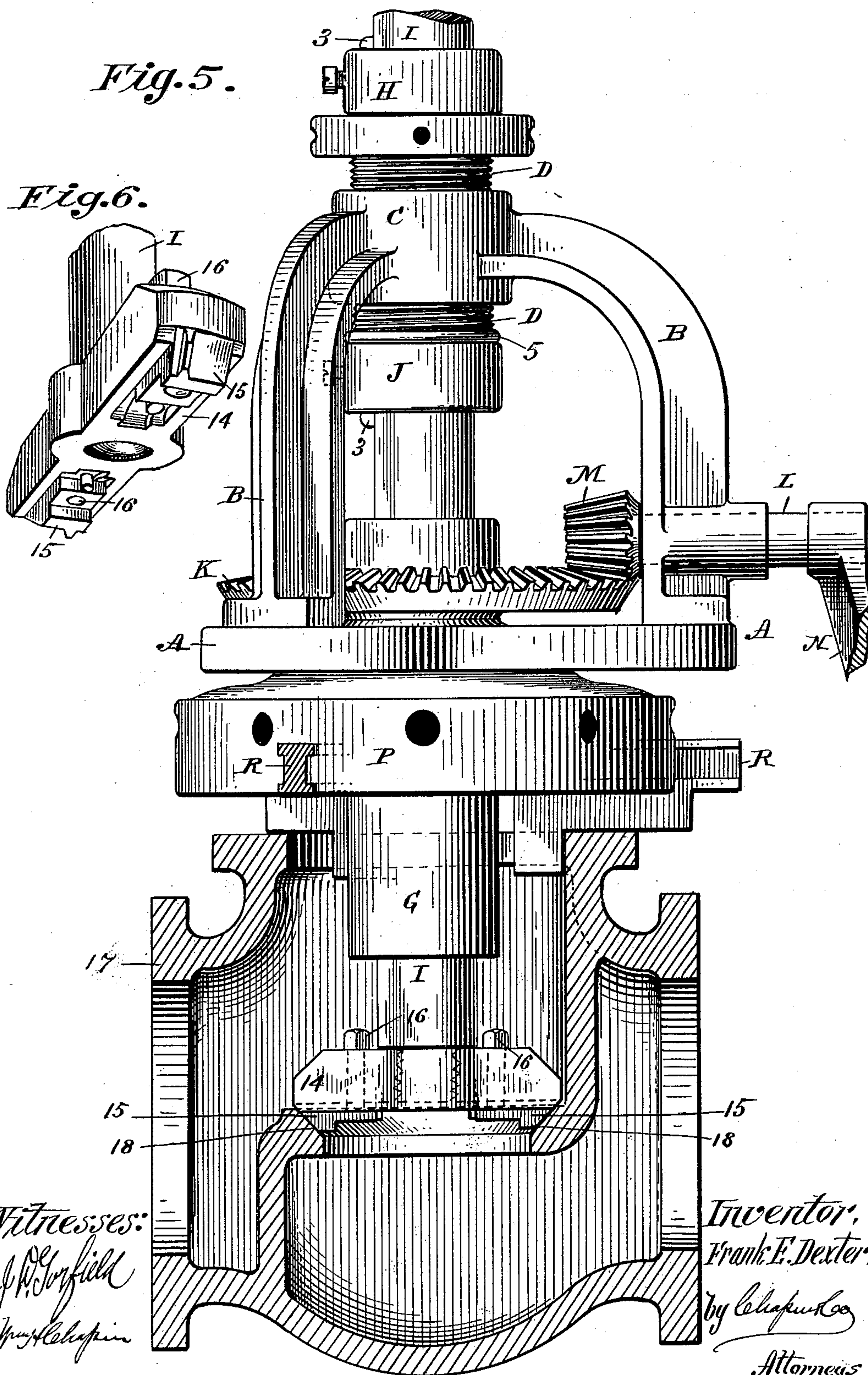
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Fig. 5.

Fig. 6.



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# UNITED STATES PATENT OFFICE.

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TO THE LEAVITT MACHINE COMPANY, OF SAME PLACE.

## MACHINE FOR REPAIRING VALVES AND VALVE-SEATS.

SPECIFICATION forming part of Letters Patent No. 560,481, dated May 19, 1896.

Application filed January 20, 1896. Serial No. 576,059. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK E. DEXTER, a citizen of the United States of America, residing at Orange, in the county of Franklin and State of Massachusetts, have invented new and useful Improvements in Machines for Repairing Valves and Valve-Seats, of which the following is a specification.

This invention relates to portable devices for repairing globe and similar valves, the object being to provide an improved device of this class for repairing the valve-seats and the valves thereof; and the invention consists in the peculiar construction and arrangement of the several parts thereof, all as hereinafter fully described, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a plan view, partly in section, of a valve-repairing device constructed according to my invention. Fig. 2 is a sectional view on line 2 2, Fig. 1. Fig. 3 is a bottom plan view of the device, this figure showing a vise in which the machine is held for operation. Fig. 4 is a perspective view of a portion of the device to be hereinafter described. Fig. 5 is a side elevation and a sectional view showing a valve-body attached to the machine. Fig. 6 is a perspective view of a portion of the spindle of the machine and a cutter-holder and cutters attached thereto.

In the drawings, A indicates a circular table, and B a series of curved converging arms integral with or firmly secured to said table. C is a screw-threaded hub integral with the upper extremities of said arms B.

D is a sleeve screwing into said hub C and having a perforated border thereon, as shown, whereby the said sleeve may be turned in the hub C by the insertion of pins in said perforations, whereby the sleeve D is adjusted to different longitudinal positions in said hub.

I is the main shaft of the machine, said shaft extending through said sleeve D and through the said table A, as shown. The said shaft I has a longitudinal spline-groove 2 formed therein, in which is fitted a spline 3.

A collar H surrounds the shaft I and the upper extremity of said spline 3, as shown, and a screw 4, through said collar, secures the latter on the shaft, said collar constituting an

abutment for the adjoining end of said sleeve D. A second collar J is secured around said shaft and spline in a similar manner to said last-named collar below the said sleeve D, and a friction-washer 5 is placed on said shaft between said collar J and the adjoining end of said sleeve. A friction-shoe E is placed in a recess in the inner wall of said hub C for frictional engagement with the screw-threaded surface of the sleeve D by means of a set-screw F acting against said shoe, the purpose of said shoe and its pressure against the sleeve D being to hold the latter from rotary movement while shaft I is being rotated, as below described. The said sleeve D, by its engagement between the collars H and J, which are secured on shaft I, serves as a means of adjusting said shaft to different longitudinal positions and for feeding the same and a tool or tools connected with it, for the purposes hereinafter set forth, which adjustment is operated by turning said sleeve, as aforesaid, in said hub C. A beveled gear K has a spline connection with said shaft I, as shown in Fig. 1, whereby the said shaft may have a sliding motion through the hub of said gear while the latter operates to rotate the shaft.

A crank-shaft L has a bearing in one of said arms B, as shown, on one end of which shaft is a beveled pinion M, engaging with said gear K. A crank N is attached to said shaft L, whereby by the rotation of the shaft L the said gear K and the shaft I are given a rotary motion. A suitable chuck P is bolted or otherwise suitably attached (see Fig. 1) to the under side of said table A, which chuck is provided with radial moving jaws R, having projecting parts thereon for holding parts of the machine or articles to be operated upon by it. The said table A has a sleeve G projecting from the under side thereof, through which the said shaft I extends. Said sleeve G serves to steady the said shaft within it, while a cutter or cutters are being operated thereby, and prevent any chattering movement of said shaft or cutters. In Fig. 1 a chuck V of a similar construction to the chuck P, above described, is attached to the extremity of the shaft I, and said chuck is shown in engagement with the spindle-socket in the hub of a valve 12 by its jaws 13. For



repairing objects similar to the said valve 12 the tool-supporting ring T is provided, which is attached to the machine by means of the said chuck P, the jaws of which engage with the borders of the central opening in said ring T, as shown in Fig. 1. The said ring T is adapted to have a tool-support W bolted to the side thereof and to have a bracket Y secured in like manner to an opposite side. The bolts 21 serve to secure the said parts W and Y to said ring, said support or bracket Y having a slot therein through which said bolt 21 passes, whereby the same is made adjustable on said ring, according to the description of the object that the center screw Z in said bracket must engage with. The said tool-support W is constructed as shown in Fig. 3, whereby a tool-holder X is clamped thereto by means of a clamping-bolt 22. The said tool-holder X is of tubular form and contains therein a tool-carrier 7, which is moved longitudinally in the holder by a screw 10, having the hand-wheel thereon. A tool 8 is secured in said carrier 7 by a set-screw 9 in the lower extremity of said carrier, said tool projecting through a slot in the side of the holder X, to the end that while an object is being rotated opposite said tool the latter may be moved along the face thereof for cutting and dressing the same. The said centering-screw Z, in the end of the bracket Y, serves, together with the shaft I, to support an object, such as said valve 12, rigidly while it is being rotated for the purpose of being operated upon by said tool 8.

In employing the within-described machine to operate in the formation of a concave or a flat-faced valve-seat the said chuck V in Fig. 1 is moved from the end of shaft I and the tool-holder 14, Fig. 5, is substituted therefor, as shown in Fig. 5. Said last-named tool-holder is adapted to be screwed or otherwise secured to the extremity of shaft I, as shown, and has on its under side suitable recesses for the reception of cutting-tools 15, which tools are secured on said holder, each by a bolt 16, as shown.

The tools which are required for different surfaces with this machine and which are secured to the holder are obviously formed for the particular uses for which they are designed.

The within-described machine, when used for dressing a part of the surface of a valve 12, as shown in Fig. 1, is preferably supported by a vise 20, Fig. 3, which grasps a projection 19 on said ring T, and when so held the position which the machine occupies most conveniently is a horizontal one, substantially as represented in Fig. 1.

The operation of the above-described machine in dressing the bearing-surfaces of valves, one of which valves 12 is shown in Fig. 1, is as follows: The chuck V is attached to the end of the shaft I, as shown in said figure, and the jaws of said chuck are caused to approach the center thereof closely enough

to permit of entering them within the spindle-socket in said valve, after which the chuck is operated to expand the jaws of the chuck, whereby the said valve becomes engaged thereby, so that the valve may be rotated when the shaft is given a rotary motion. The center screw Z, supported on the bracket Y, is turned up to engagement with the center of said valve. The tool 8 is then adjusted through the tool-support W and the screw 10 to proper position to operate on said valve. The shaft I having already been properly adjusted longitudinally by the sleeve D, and being so held in position by the collars H and J, the crank N is then operated through the pinion and gear M and K, whereby rotary motion is imparted to the valve 12, and during said rotary motion the tool 8 is caused to move across the face of the bearing portion of the valve 12, which is to be dressed, by turning said screw-rod 10 by means of the hand-wheel on the outer end thereof. Said valve having been properly dressed, as described, it is freed from the machine, so that it may be taken therefrom by operating chuck V to move its jaws centrally thereon and by unscrewing the screw Z thereunder.

In operating the device for dressing the seat 18 of the valve-body 17 (illustrated in Fig. 5) the said tool-holder 14, having the proper tools thereon, is attached to the lower extremity of the shaft I. Said shaft is then adjusted longitudinally to carry the cutters 18 against the surface of said valve-seat, as shown. The said adjustment of the cutters against the valve-seat is effected by freeing the friction-shoe E from its pressure against the sleeve D and then screwing down said sleeve against the collar J, which is tightly attached to the shaft, thus adjusting the cutters, as aforesaid. Then by turning the crank N and shaft I the cutters are rotated, and from time to time, until the seat shall have attained a proper finish, the sleeve D is turned slightly to carry the tool more and more against the work. Should the work offer a good deal of resistance to the action of the cutter, the sleeve D is prevented from so rotating in the hub C by the upward pressure of collar J against its lower end by forcing said shoe E against the sleeve D and there holding it by the screw F each time that the shaft is adjusted to position to secure a proper operation of the cutters upon the work.

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

1. In a machine for repairing valves and valve-seats, a table having converging arms secured to and extending from one side thereof, an internally-screw-threaded hub fixed between the extremities of said arms, and a centrally-located sleeve extending from one side of said table in a direction opposite to that of said arms, combined with a longitudinally-adjustable sleeve D, screwing into said hub, a tool and work carrying shaft having



a spline-groove therein extending through said sleeve, a collar adjustably secured on said shaft at each end of said sleeve D, a spline engaging said spline-groove and said adjustable collars, and means for rotating said shaft, substantially as described.

2. In a machine for repairing valves and valve-seats, a table having converging arms extending from one side thereof, an internally-screw-threaded hub fixed between the extremities of said arms, and a centrally-located sleeve extending from one side of said table in a direction opposite to that of said arms; combined with a longitudinally-adjustable sleeve D, screwing into said hub, a tool-carrying shaft extending through said two sleeves having a spline-groove therein, a collar adjustably secured on said shaft at each end of said sleeve D, a spline engaging said spline-groove and said adjustable collars, a device-supporting ring connected to said table, a turning-tool secured to said ring, and means for imparting a rotary motion to said shaft, and for moving said tool against its work, substantially as set forth.

3. In a machine for repairing valves and valve-seats, a table having converging arms extending from one side thereof, an internally-screw-threaded hub fixed between the extremities of said arms, combined with a longitudinally-adjustable sleeve D, screwing into said hub, a friction-shoe in the inner wall of said hub, and means for forcing said shoe against said sleeve, a tool-carrying shaft having a spline-groove therein extending through said sleeve, a collar adjustably secured on said shaft at each end of said sleeve D, a spline engaging said spline-groove and said adjustable collars, and means for rotating said shaft, substantially as described.

4. In a machine for repairing valves and valve-seats, a table having converging arms extending from one side thereof, an internally-screw-threaded hub fixed between the extremities of said arms, and a centrally-located sleeve extending from one side of said table in a direction opposite to that of said arms, combined with a chuck having radially-moving jaws secured under said table, a longitudinally-adjustable sleeve D, screwing into said hub, a tool-carrying shaft having a spline-groove therein extending through said two sleeves, a collar adjustably secured on said shaft at each end of said sleeve D, a spline engaging said spline-groove and said adjustable collars, a device-supporting ring T, engaged by the jaws of said chuck, the

center supporting-bracket Y, attached to said ring having thereon the center screw Z, a chuck having radially-moving jaws attached to the extremity of said shaft in proximity to said ring, a turning-tool secured to said ring and means for imparting a rotary motion to said shaft, substantially as set forth.

5. In a machine for repairing valves and valve-seats, a table having converging arms extending from the sides thereof, an internally-screw-threaded hub fixed between the extremities of said arms, and the sleeve G, fixed to and extending at right angles to the side thereof, combined with a longitudinally-adjustable sleeve D, screwing into said hub, a friction-shoe in the inner wall of said hub, and means for forcing said shoe against said sleeve, a tool-carrying shaft having a spline-groove therein extending through said sleeves, a collar adjustably secured on said shaft at each end of said sleeve D, a spline engaging said spline-groove and said adjustable collars, means for rotating said shaft and a tool-holder 14, carried thereby, having cutting-tools secured thereon, substantially as described.

6. In a machine for repairing valves and valve-seats, a table A, having converging arms B, and a centrally-located sleeve G, thereon, combined with a rotatable shaft I, having its bearings between the converging ends of said arms and within said sleeve, a chuck P, secured to said table, a device-supporting ring T, engaged by said chuck, a support W, adjustably attached to said ring T, a tool-case X, adjustably attached to said support W, a tool-carrier within said case X, and a tool carried thereby, and means for adjusting said tool-carrier in its support W, and moving said tool independently of said carrier, and for rotating said shaft I, substantially as set forth.

7. The ring T, the tool-support W, attached thereto, the tool-case X, held by, and longitudinally adjustable in said support, the tool 8, a movable carrier in said case to which said tool is secured, and means for moving said carrier within its case, combined with the shaft I, supported to rotate within said ring, a work-holding chuck V, carried on said shaft, and means for rotating said shaft, substantially as set forth.

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