

No. 614,226.

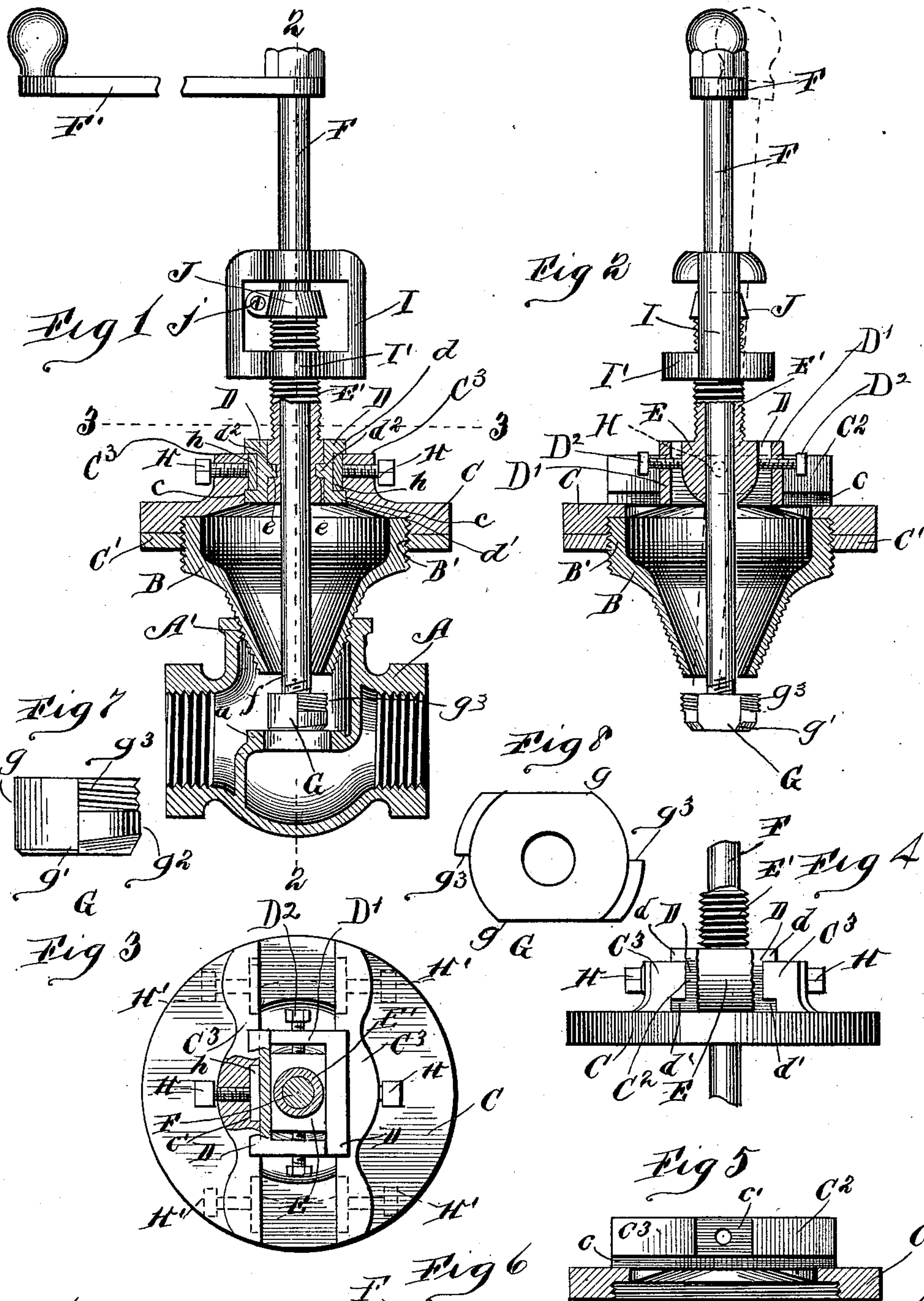
Patented Nov. 15, 1898.

C. E. HUXLEY.

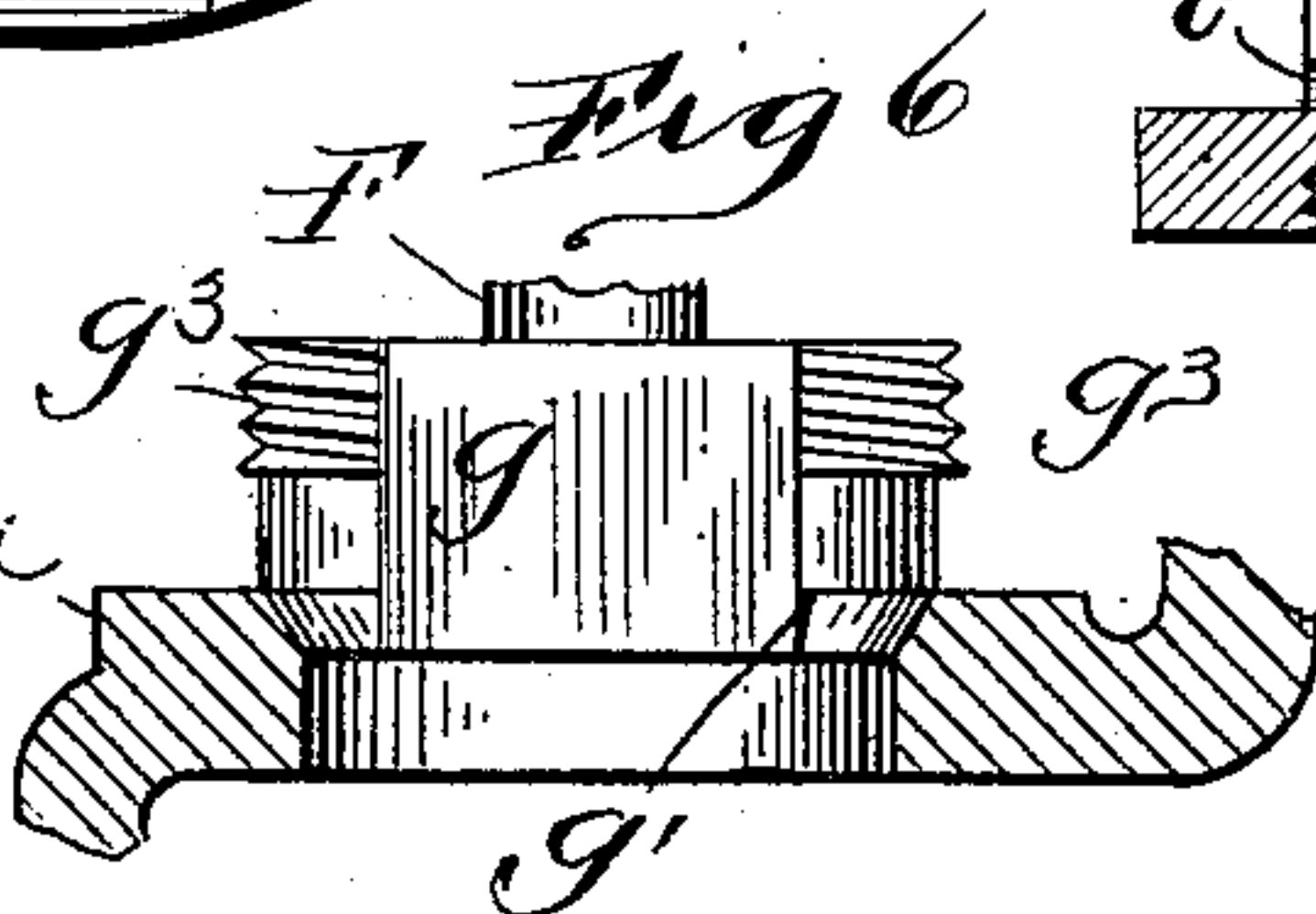
IMPLEMENT FOR REMODELING VALVE SEATS.

(Application filed Dec. 3, 1897.)

(No Model.)



Witnesses
 W. C. Coates
 C. H. Crawford



Inventor
 Charles E. Huxley

by Poole & Brown
 Attys

UNITED STATES PATENT OFFICE.

CHARLES E. HUXLEY, OF AURORA, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO
FREDERICK WAHL AND GEORGE E. RICKER, OF QUINCY, ILLINOIS.

IMPLEMENT FOR REMODELING VALVE-SEATS.

SPECIFICATION forming part of Letters Patent No. 614,226, dated November 15, 1898.

Application filed December 3, 1897. Serial No. 660,577. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HUXLEY, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Implements for Remodeling Valve-Seats; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved device in the nature of a hand implement for remodeling valve-seats, the purpose of the invention being to provide an implement which may be adjustably secured to a valve-casing in position for operation upon the valve-seat of a cutting-tool forming a part of the implement.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a view in central longitudinal section of a valve-casing, together with an implement embodying my invention applied thereto in position for operation. Fig. 2 is a similar section taken on line 2 2 of Fig. 1. Fig. 3 is a plan section taken on line 3 3 of Fig. 1. Fig. 4 is a detail side view of the supporting disk or plate of the implement. Fig. 5 is a cross-section of said plate detached from the other parts. Fig. 6 is an enlarged side view of the cutting implements shown in other figures, illustrating its action upon the valve-seat. Fig. 7 is a side elevation of said cutting-tool. Fig. 8 is a plan view of the same.

As shown in said drawings, A indicates a valve-casing, such as that of an ordinary globe-valve, said casing being provided with a valve-seat *a* and with a screw-threaded opening A', which when the valve is in use receives the head which carries the valve-spindle.

B indicates a hollow, tapered, and externally-screw-threaded plug which is adapted for insertion in the opening A' of the valve-casing and for engagement with the screw-threads of said opening. Said plug serves to

support or sustain the other parts of the implement in position for action upon the valve-seat.

C indicates a circular supporting plate or disk which is secured to the outer end of the tapered plug B by means of a cylindric screw-threaded part B' at the outer end of the plug, which enters and has screw-threaded engagement with a cylindric recess in the inner surface of said plate C. A screw-threaded ring C' surrounds the screw-threaded part B' of the plug below the plate C and is adapted for contact with said plate, so as to form, in effect, a jam-nut to hold the plate firmly in place upon the plug. Said plate C is provided with a centrally-arranged transverse slot or opening C², Figs. 2 and 5, and on the outer side of the plate at opposite sides of said opening are formed two parallel guide-flanges C³ C³, provided on their inner faces adjacent to the supporting-plate with grooves *c*. Between said flanges are located two sliding blocks or gibs D D, provided at their upper and lower edges with outwardly-extending flanges *d d'*, of which the outer flanges *d* extend over the top surfaces of the guide-flanges C³ and the inner flanges *d'* and enter the grooves *c*. Each of said gibs is provided at one end with a lateral inwardly-extending arm or cross-piece D', which extends nearly to the inner face of the opposite gib. Between said gibs is located a swivel block or head E, which has pivotal connection with said gibs, to which is attached a screw-threaded sleeve E', which extends upwardly or outwardly therefrom. Through the said head and sleeve passes a shaft or spindle F, which is provided at its outer end with a hand-crank F', by which it may be turned or actuated, and has at its inner end a screw-threaded portion *f* for the attachment of a cutting-tool, such as the cutting-head G illustrated in the drawings. The sliding gibs D D, together with the swivel-block E and clamping devices which are provided for holding said parts rigidly in position with respect to the plate C, constitute a means for adjustably supporting the tool-carrying spindle F in proper position with respect to the valve-seat to be operated upon. The details of construction illustrated for

pivotal supporting the swivel-plate and for clamping or holding said several parts in their adjusted position are as follows:

Pivotal connection between the gibs D and the swivel-block is afforded by means of studs or projections d^2 , formed on the inner or adjacent faces of said gibs and engaging opposite bearing-recesses e , formed in the flat side faces of the swivel-block, as clearly seen in Fig. 1. Such pivotal connection of the swivel-block with the sliding gibs enables the tool-spindle to be swung into an inclined or oblique position, as clearly shown in Fig. 2, the sliding of the gibs on the guide-flanges C^3 enabling the swivel-block to be bodily moved to the right or left, as may be required to bring the cutting-tool accurately in place with respect to the valve-seat when the said spindle stands in an inclined position. For clamping and holding the gibs in place after adjustment, as well as for holding the swivel-block rigidly in its adjusted position, suitable clamping means are arranged to act upon the outer faces of the gibs so as to press the same toward each other and against the interposed swivel-block. The clamping means herein shown for this purpose consists of set-screws H H, which are inserted through the guide-flanges C^3 and act against the outer faces of the gibs. I preferably interpose bearing-plates h between the inner ends of the set-screws and the gibs, said bearing-plates being located in recesses c' , formed in the inner faces of the guide-flanges, as clearly seen in Figs. 3 and 5. I have shown only one pair of set-screws H H, but obviously additional set-screws, as indicated in dotted lines at H', Fig. 3, may be employed in cases where a considerable range of adjustment is needed and the gibs are likely to be moved at some distance from the center of the supporting-plate. The arms D' of the gibs are provided with set-screws D^2 D^2 , which are adapted to bear against the head E, which latter is made cylindric in its lower end to afford a bearing-surface, concentric with the pivotal axis of the head, against which said screws may act. Said set-screws D^2 D^2 constitute a means, in addition to the other clamping devices described, for firmly holding said swivel-block in its adjusted position.

In order to adjust the tool at an angle with respect to the valve-casing, as required where the valve-seats are out of parallel with the opening of the valve-casing, it will be necessary to turn the supporting-plate C so as to bring the guide-flanges C^3 parallel with the plane of the inclination of the tool-spindle, and this adjustment of the supporting-plate is easily effected by loosening the screw-ring C' and then turning the supporting-plate upon the screw-plug until the said guide-flanges are brought in a desired position with respect to the valve-seat. The screw-ring may then be tightened against the holding-plate to prevent further turning of said plate and to hold the latter firmly in position.

In connection with the device above described for adjustably supporting the actuating-spindle I have herein shown a feed device by which the tool attached to the spindle may be fed or advanced as the work progresses, said feed device being made as follows: The sleeve E' is provided with an external screw-thread, which is engaged with a nut I' , which forms the lower part of a yoke I, the upper end of which engages the spindle F at a point above said sleeve and is adapted to turn freely thereon. Mounted upon the spindle below the upper part of the yoke and within the latter is an adjustable collar J, herein shown as consisting of a split ring provided with a clamping-screw j , by means of which the ring may be tightened on the spindle, and thereby held from movement thereon. Said collar J serves as a shoulder or abutment against which the upper part of the yoke I acts when the yoke is turned downwardly upon the sleeve E' in such manner as to force or draw downward the spindle F, and thus advance the cutting-tool to its work.

The implement illustrated is intended more especially for the purpose of inserting new valve-seats in old valves, the intent being that in the case of an ordinary globe-valve having the usual conical seat made integral with the walls of the valve-casing the seat should first be reamed out or enlarged and then screw-threaded, and that a screw-threaded bushing should then be inserted to form a new valve-seat. The tool G herein illustrated is especially intended for reaming out and screw-threading valve-seats, and said tool, which is shown in detail in Figs. 6, 7, and 8, involves improved features of construction, as follows: Said tool has the form of a head or block which is provided with a central aperture for engagement with the screw-threaded end of the spindle F. At opposite sides of said block are formed shoulders g g , forming, with the outer faces of the block, cutting edges like those of a milling-tool or reamer. At the lower or forward face of the block are formed oblique cutting edges g' g' , which act to cut away or remove the metal of the seat as the block is advanced through the same. Adjacent to the cutting edges g' the shoulders g have edges g^2 , which are parallel with the axis of the tool, so that they serve practically as guides and do no cutting, except so far as they may serve to remove any slight irregularities left by the action of the oblique cutting edges by which the seat is reamed out as the tool advances. Such edges g^2 extend a distance equal at least to the thickness of the valve-seat, so that no further work is done by the tool as it advances until the reaming is completed. At the outer or upper part of the block, between the outer face thereof and the surface g^2 , are formed screw-cutting threads g^3 , which act in the manner of an ordinary tap to form screw-threads on the inner surface of the

seat, which has been reamed out by the action of the reaming-cutters. The tool described has the important advantage of enabling the valve-seat to be both reamed out and screw-threaded in one operation and without any change of the tool used, while at the same time the operation of forming the screw-threads is not in the least interfered with by the operation of reaming, for the reason that by reason of the special shape or construction of the cutting-head the screw-threading devices do not come into action until after the reaming is completed.

The devices for adjusting the inclination of the tool-spindle with respect to the plane of the openings of the valve-casing is intended more particularly for use in remodeling valves of that class having obliquely-arranged valve-seats—such, for instance, as gate-valves—in which the moving part of the valve is of tapered form and enters between two oppositely-inclined valve-seats. Such devices for adjusting the inclination of the spindle, however, are useful in other cases, inasmuch as they afford a means for bringing the cutting-tool accurately into position with respect to the central axis of the valve-seat without regard to the location of the opening in which the supporting-plug is inserted.

In adjusting the spindle to the work the plate C will be turned on the plug until the guide-flanges of the plate are brought parallel with the plane in which the tool is to be inclined. The swivel-block and gibs between which it is secured will then be shifted or moved on said guides to a greater or less distance from the center of the device in accordance with the inclination required to be given to the spindle in order to bring the cutting-tool accurately in position with respect to the valve-seat, it being of course understood that the cutting-tool will preferably be adjusted to operate concentrically with the valve-seat as originally made or formed.

I claim as my invention—

1. An implement for remodeling valve-seats comprising a hollow, tapered, screw-threaded plug, a supporting-plate having screw-threaded engagement with the outer end of the plug, said plate being provided with parallel guide-flanges on its outer face, a swivel-block, gibs having pivotal engagement with the same, said swivel-block and gibs being inserted and clamped between said guide-flanges, and a tool-supporting spindle passing through and sliding in said swivel-block.

2. An implement for remodeling valves, comprising a hollow tapered supporting-plug, a supporting-plate having screw-threaded engagement with the plug, a screw-threaded ring engaging said plug and adapted to bear against the plate to form a jam-nut, and a tool-supporting spindle which passes through said plate and is supported therein by means

affording rotative and endwise sliding movement in said plate.

3. An implement for remodeling valves, comprising a hollow, tapered, screw-threaded plug, a supporting-plate mounted thereon and provided with parallel guide-flanges, gibs engaging said guide-flanges, a swivel-block located between said gibs and having pivotal engagement therewith by means of pivot-studs on one of said parts, clamping means for holding said gibs and swivel-block from movement upon the supporting-plate and a tool-actuating spindle passing through said swivel-block.

4. An implement for remodeling valves comprising a hollow, tapered, screw-threaded plug, a supporting-plate mounted on said plug and provided with parallel guide-flanges, gibs mounted to slide on said guide-flanges, a swivel-block located between the gibs and having pivotal engagement therewith, a tool-supporting spindle mounted in said swivel-block, and set-screws passing through the said flanges and acting on the gibs to clamp the same and the interposed swivel-block from movement.

5. An implement for remodeling valves, comprising a hollow, tapered, screw-threaded plug, a supporting-plate mounted on said plug and provided with parallel guide-flanges, gibs mounted to slide on said guide-flanges, a swivel-block located between the gibs and having pivotal engagement therewith, a tool-supporting spindle mounted in said swivel-block, set-screws passing through said flanges and acting on the gibs to clamp the same and the interposed swivel-block from movement, and bearing-plates between the inner ends of said set-screws and the said gibs.

6. An implement for remodeling valves, comprising a hollow, tapered, screw-threaded plug, a supporting-plate mounted on said plug and provided with parallel guide-flanges, gibs mounted to slide in said guide-flanges, a swivel-block located between said gibs and having pivotal engagement therewith, clamping devices acting on the gibs to clamp the swivel-block between them, and set-screws passing through the gibs and bearing against the swivel-head.

7. An implement for remodeling valves, comprising a hollow, tapered, screw-threaded plug, a supporting-plate mounted thereon and provided with guide-flanges, gibs sliding on the guide-flanges, a swivel-block located between and pivotally connected with the said gibs, a screw-threaded sleeve attached to said swivel-block, a tool-actuating spindle passing through said sleeve and block, an adjustable collar on the spindle, a yoke having screw-threaded engagement with the said sleeve and adapted to bear against the collar, and clamping means for holding the said gibs and swivel-blocks from movement.

8. An implement for remodeling valve-

seats, comprising a tool-actuating spindle having both endwise and rotative movement, and a rotative cutting-tool adapted for attachment to the spindle, said tool being provided at its advance end with oblique cutting edges for reaming, and at its rear end with screw-cutting edges, and with intermediate bearing edges between the said oblique cutting edges and the screw-cutting edges of a length equal to or greater than the thickness of the seat to be operated upon, so that the

reaming operation will be completed before the screw-cutting edges are brought into operation.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 25th day of October, A. D. 1897.

CHARLES E. HUXLEY.

Witnesses:

WILLIAM L. HALL,

R. CUTHBERT VIVIAN.