

(No Model.)

J. POWELL.

DIE FOR COMPRESSING VALVE SEAT BLANKS.

No. 408,322.

Patented Aug. 6, 1889.



FIG. 2'.

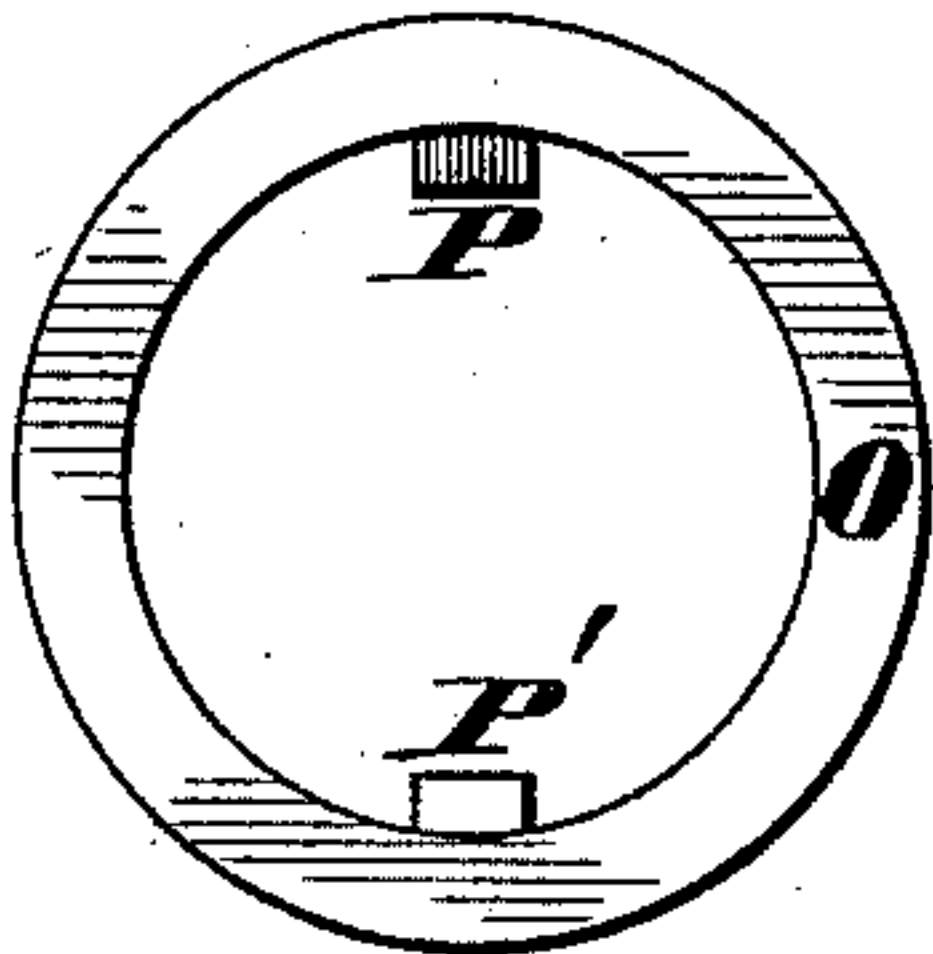


FIG. 3'.

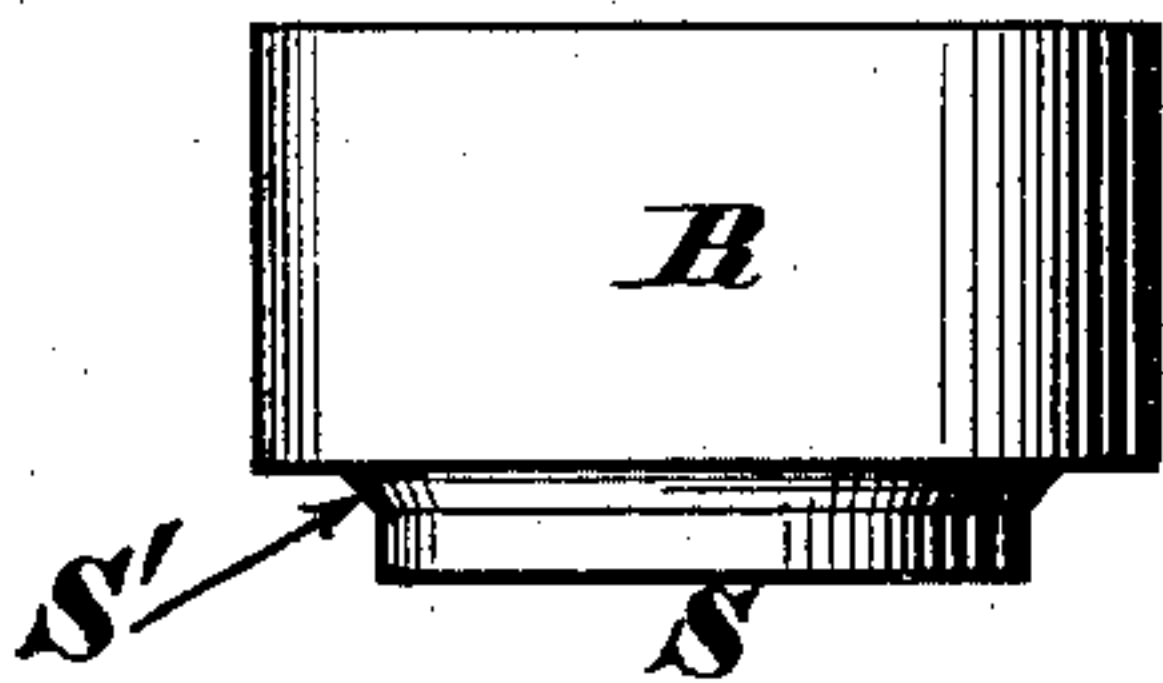


FIG. 4'.

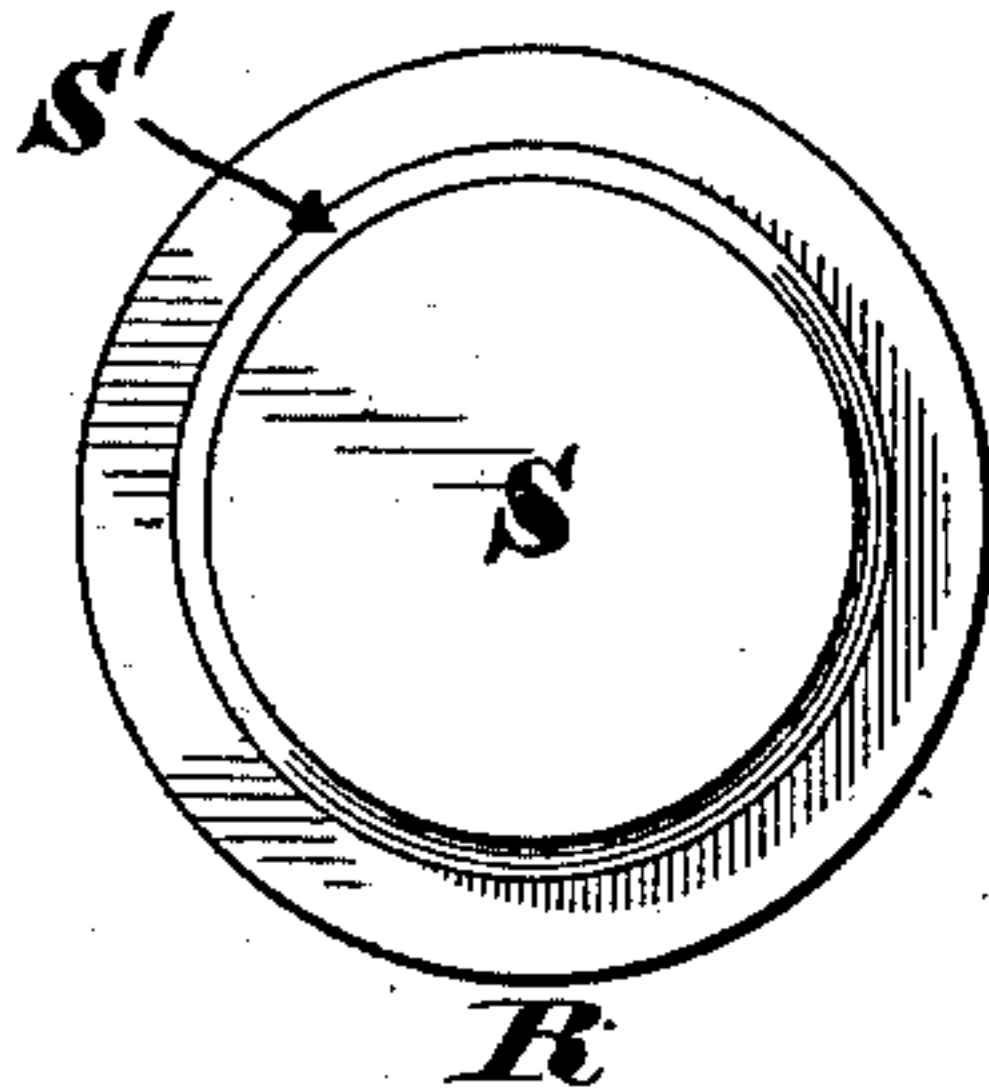
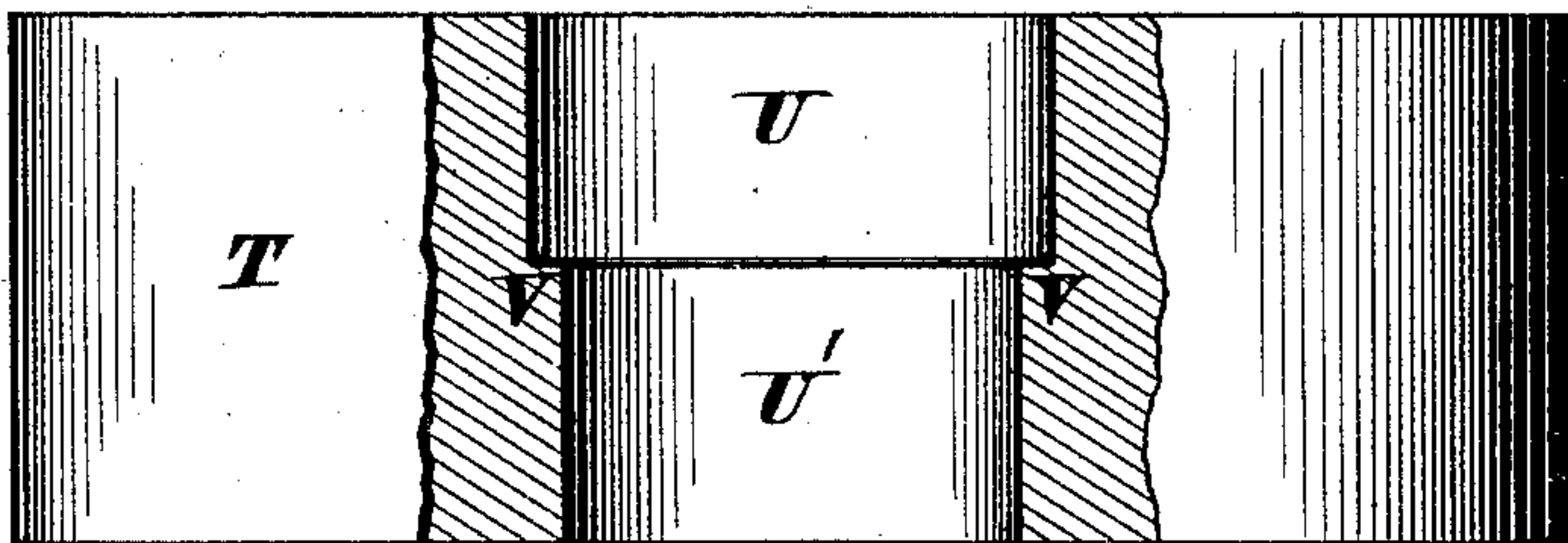


FIG. 5'.



Attest.
S. S. Carpenter.
M. C. Layman.

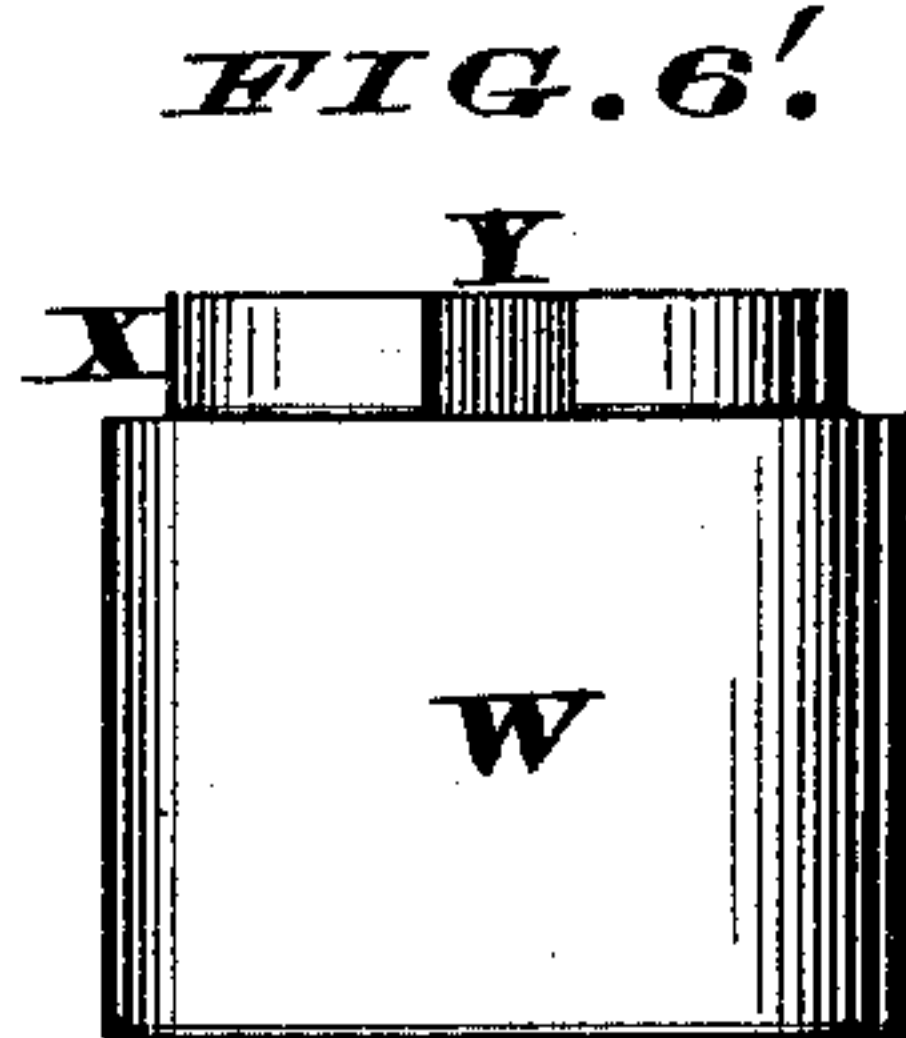


FIG. 7'.

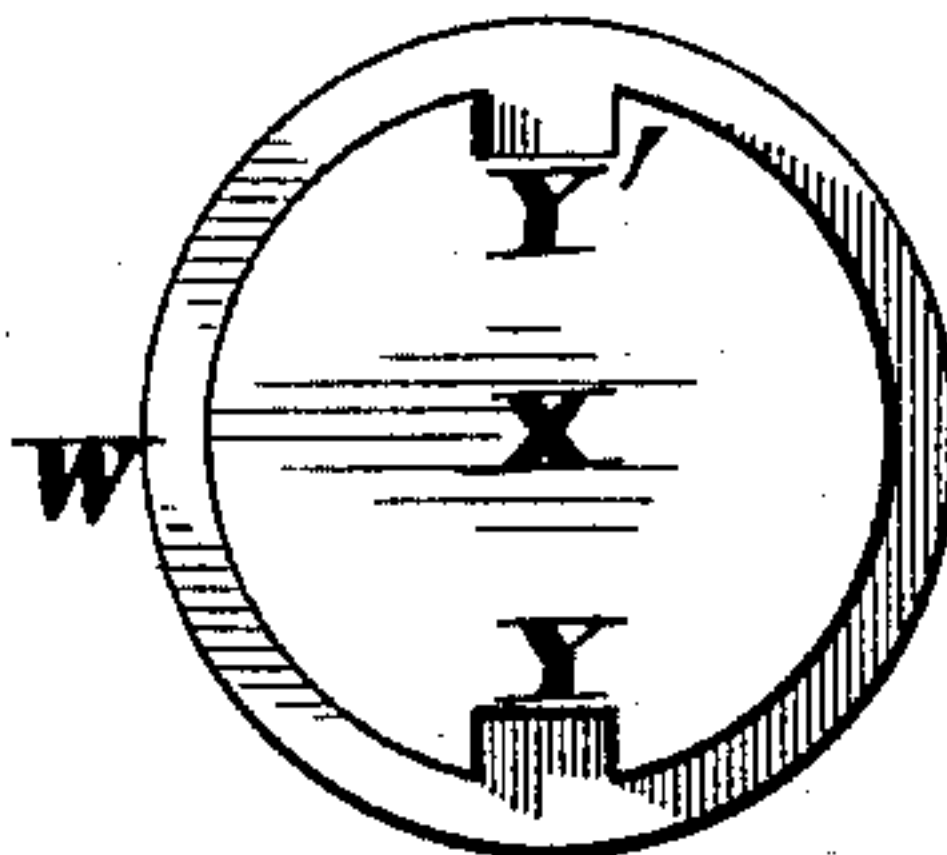


FIG. 8'.

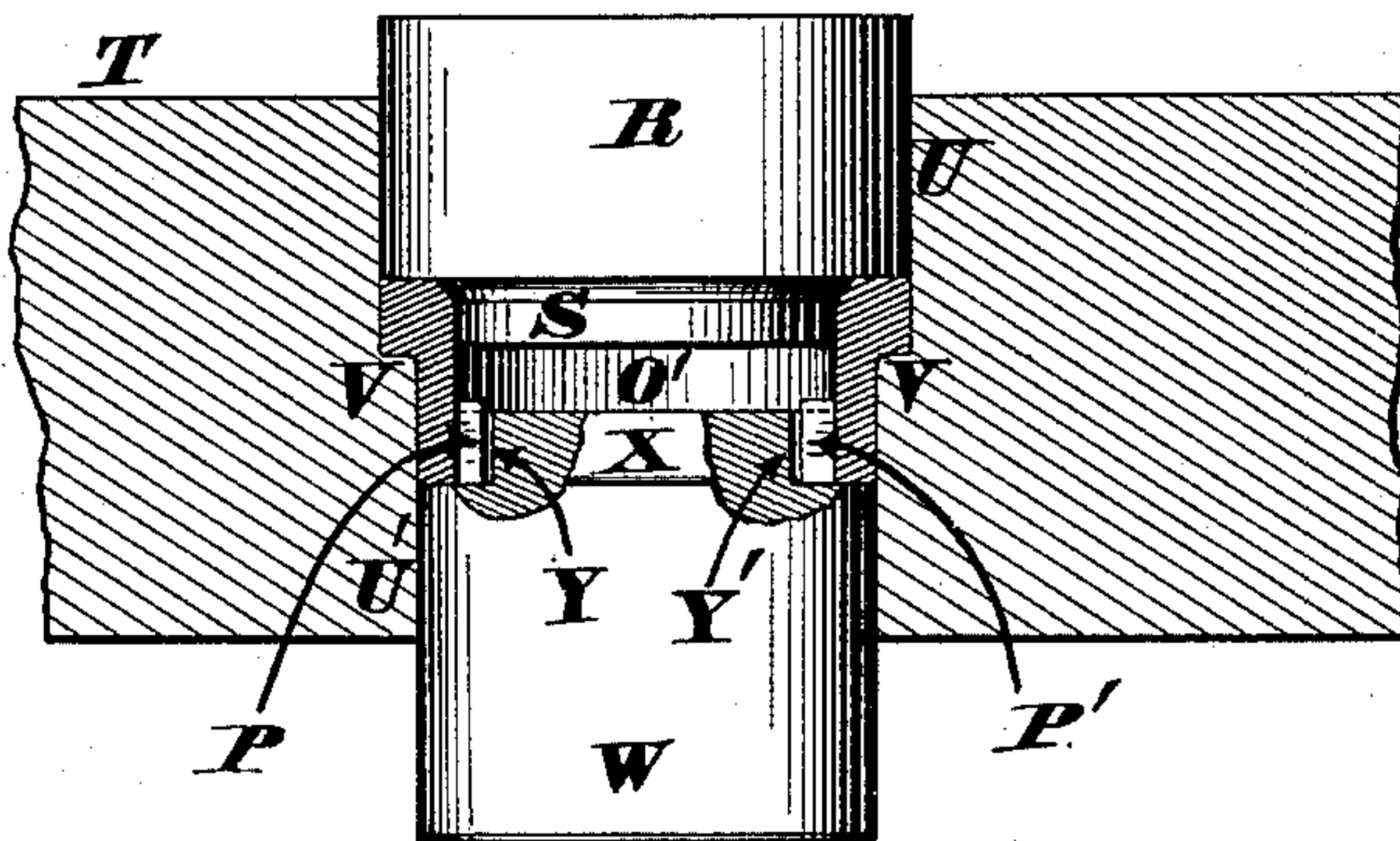
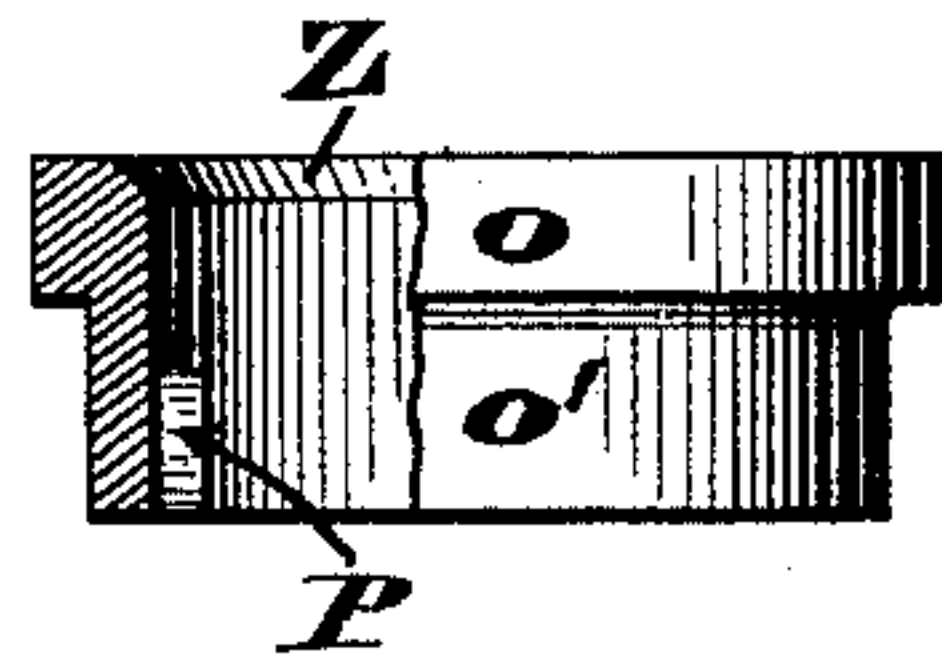


FIG. 9'.



Inventor.
James Powell
by James H. Layman.
Atty.

UNITED STATES PATENT OFFICE.

JAMES POWELL, OF CINCINNATI, OHIO.

DIE FOR COMPRESSING VALVE-SEAT BLANKS.

SPECIFICATION forming part of Letters Patent No. 408,322, dated August 6, 1889.

Application filed May 10, 1887. Renewed May 1, 1889. Serial No. 309,319. (No model.)

To all whom it may concern:

Be it known that I, JAMES POWELL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton, State of Ohio, have invented certain new and useful Appliances for Hardening Cast-Metal Valve-Seats, of which the following is a specification, reference being had therein to the accompanying drawings.

The first part of my invention includes certain appliances for condensing or hardening cast-metal valve-seats, which are subsequently fitted in cocks and other similar devices for controlling the flow of steam, gases, fluids, &c. These seats must have inclined bearings or counterbores for the valves to close against, and the appliances referred to consist of two distinct members—to wit, a swage-block provided with a pair of communicating bores of unequal diameters separated by an annular ledge, and a punch or plunger having a cylindrical shank and tapering fillet, which fillet hardens the inclined bearing when the casting is inserted within the bores of said block and operated on, as hereinafter more fully described.

The second part of my invention consists in using an auxiliary punch or plunger in connection with the above-described appliances, said punch being provided with a pair of side pockets to admit lugs projecting inwardly from a certain class of valve-seats, as hereinafter more fully described.

Figure 1' is a side elevation of the rough casting to be converted into a valve-seat. Fig. 2' is a plan of the same. Fig. 3' is a side elevation of the upper punch. Fig. 4' is a plan thereof. Fig. 5' is a sectionized elevation of the curb that holds the casting while being swaged. Fig. 6' is a side elevation of the lower punch. Fig. 7' is a plan of the same. Fig. 8' is a section showing the method of condensing the valve-seat. Fig. 9' is a sectionized elevation of the hardened and condensed valve-seat.

The valve-seat is made of any metal or composition of metals that can be hardened or condensed by pressure or hammering and is of any size and shape best adapted for a valve-seat. In the present case, however, it is shown as composed of two members O O',

the upper of which O is somewhat shorter and slightly larger in diameter than the lower member O', which latter is provided with a pair of internal and diametrically-opposite lugs P P', for a wrench or turning-bar to engage with when the finished valve-seat is to be screwed into the diaphragm of the shell.

R is the upper punch, which is cylindrical and has at its lower end a short cylindrical shank S, joined to the body by an inclined fillet S'.

T represents a swage-block having two communicating bores U U', of unequal diameters, the upper bore U being the larger and having an annular ledge V at bottom.

W is the cylindrical lower punch, its upper end being provided with a short cylindrical shank X, having pockets Y Y' on its opposite sides. These various appliances are used in the following manner:

The rough casting O O' is first inserted in the bore U of swage-block T, and the closely-fitting punch R is driven into said bore for the purpose of forcing the casting down until it rests on the annular ledge V, as seen in Fig. 8'. The under punch W is then inserted in the other bore U' of the swage-block, care being taken to engage the lugs P P' of the casting with the pockets Y Y' of the punch, and said punch is then set upon a suitable anvil or the bed-plate of a drop-press. The exposed end of the upper punch R is then struck with a hammer or drop-press plunger, so as to condense or harden the casting to the desired degree. The number of blows and the force with which they are applied will of course vary with the size of the casting and the metal or metals of which it is composed, and after the first or any subsequent blow the ring may be taken out of the curb and then annealed. This removal of the ring is readily effected by driving the lower punch W up through the swage-block, and when thus detached said ring will present the appearance seen in Fig. 9', where o o' represent the smooth exterior of the casting, and Z the hard seat or bearing of the same, which seat was formed by the inclined fillet S' of the upper punch.

I claim as my invention—

1. A valve-seat-hardening appliance con-

sisting of the swage-block T, having a pair of communicating bores U U', of unequal diameters, separated by an annular ledge V, in combination with the punch R, having a cylindrical shank S and tapering fillet S', which
5 fillet operates against the counterbore of the valve-seat, as herein described.

2. A valve-seat-hardening appliance consisting of the swage-block T, having a pair of
10 communicating bores U U', of unequal diameters, separated by an annular ledge V, in

combination with the punch R, having a cylindrical shank S and tapering fillet S', and an auxiliary punch W, provided with a shank X and side pockets Y Y', as described. 15

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

JAMES POWELL.

Witnesses:

JAMES H. LAYMAN,
SAML. S. CARPENTER.