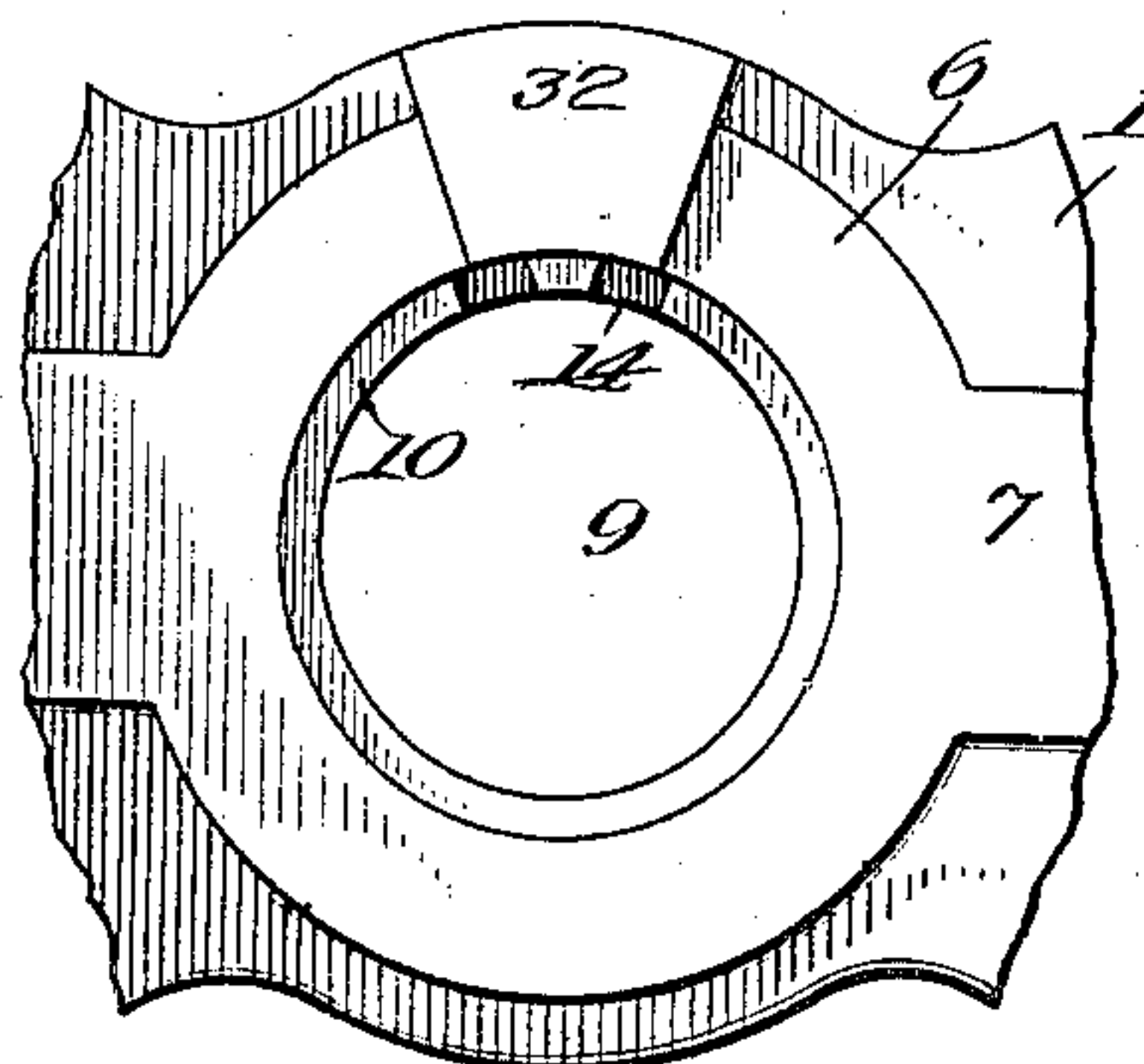
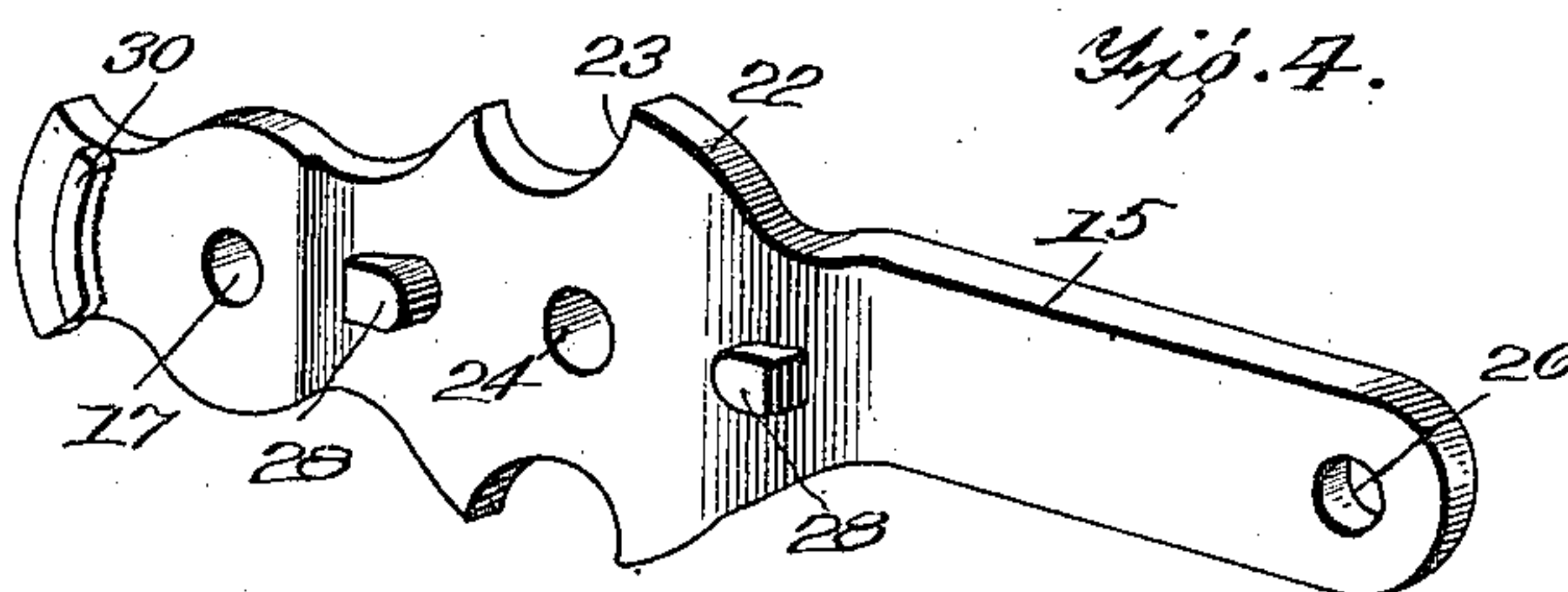
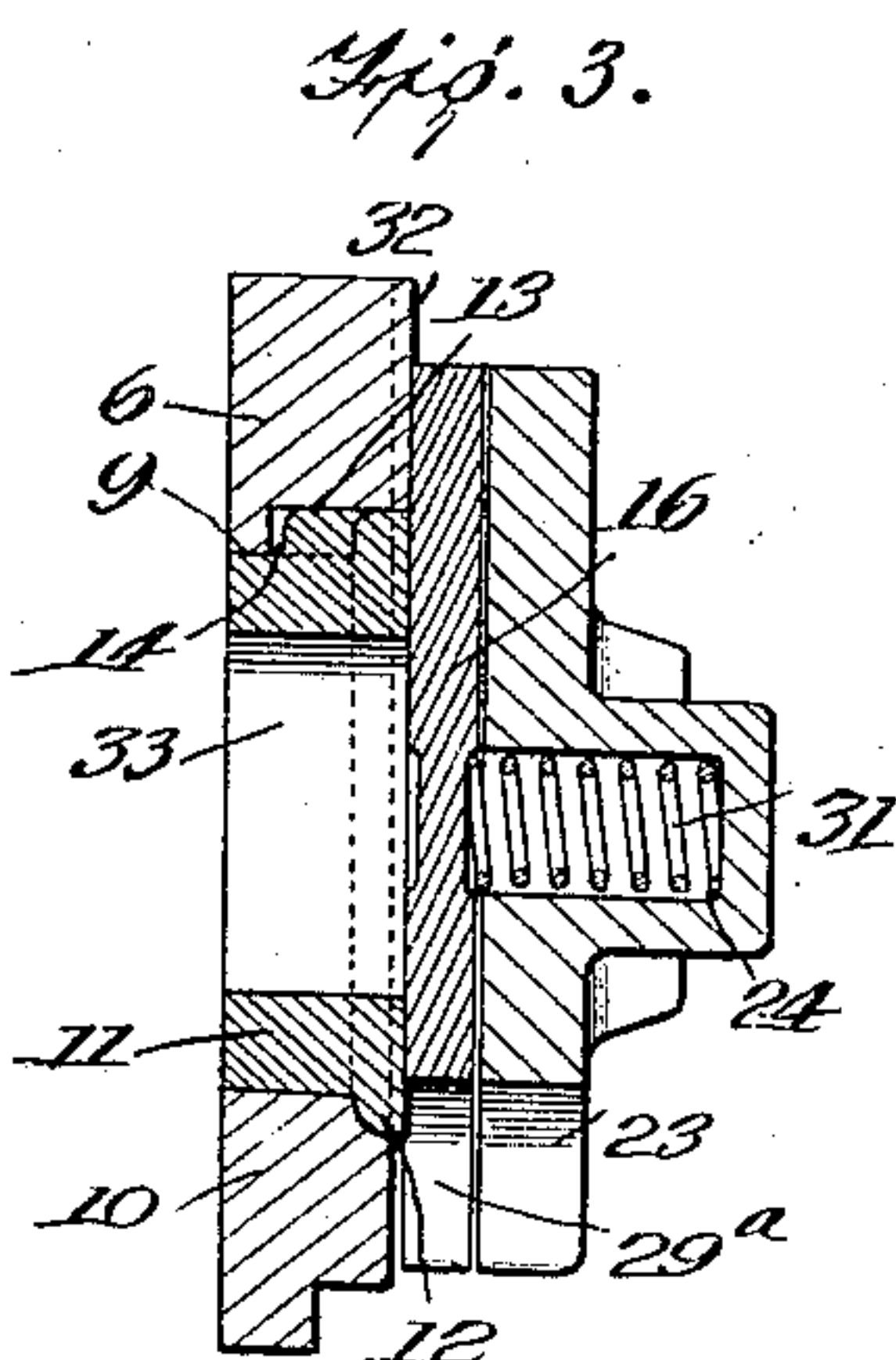
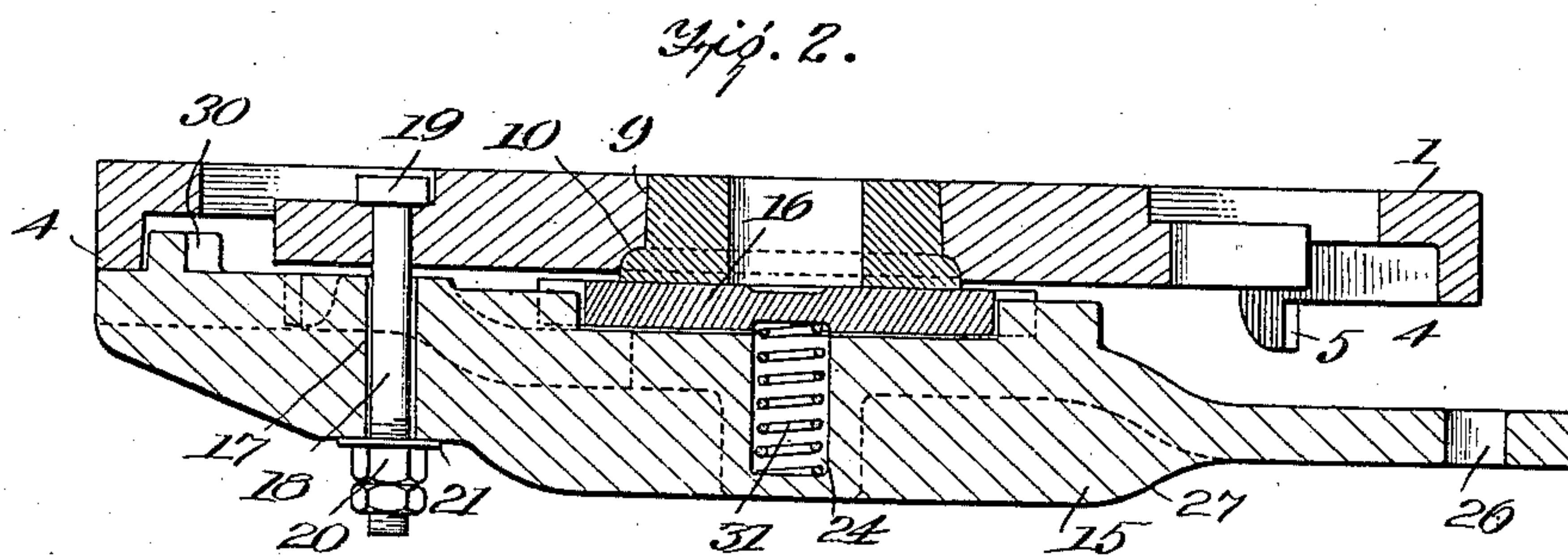
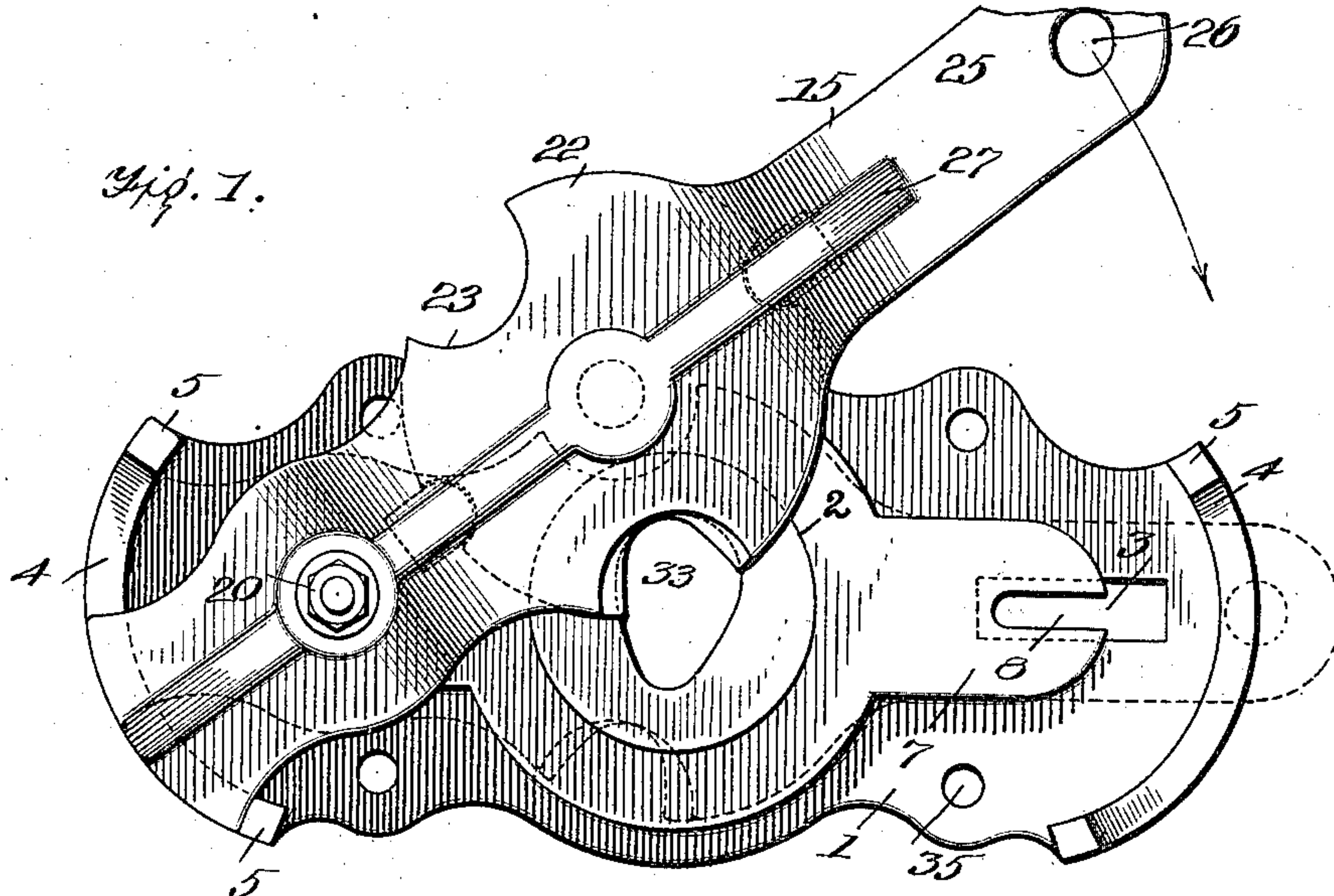


R. M. CLARK.  
GATE OR CUT-OFF FOR CUPOLAS.  
APPLICATION FILED APR. 27, 1910.

966,310.

Patented Aug. 2, 1910.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

REUBEN MARSHALL CLARK, OF WEBB CITY, MISSOURI.

GATE OR CUT-OFF FOR CUPOLAS.

966,310.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed April 27, 1910. Serial No. 557,899.

To all whom it may concern:

Be it known that I, REUBEN M. CLARK, a citizen of the United States, and a resident of Webb City, in the county of Jasper and State of Missouri, have made certain new and useful Improvements in Gates or Cut-Offs for Cupolas, of which the following is a specification.

My invention is an improvement in gates or cut-offs for cupolas, and consists in certain novel constructions, and combinations of parts, hereinafter described and claimed.

The object of the invention is to provide a device of the character specified, wherein the passage for the molten metal may be easily and expeditiously enlarged or decreased in size, while remaining approximately circular to offer a minimum of resistance to the passage of the material, and which may be reversed and used with the same result.

A further object is to provide a device wherein the bushing and shoe are of hard metal, thus resisting wear the greatest possible length of time, and wherein the said parts may be removed and replaced when worn without removing the other parts of the gate.

Referring to the drawings forming a part hereof, Figure 1 is a front view of the improvement, Fig. 2 is a longitudinal section, Fig. 3 is a central transverse section, Fig. 4 is a perspective view of the gate support from the inner side, and Fig. 5 is a front view of the central portion of the gate.

The embodiment of the invention shown in the drawings consists of a frame 1 having a central opening 2, and provided near each end with a longitudinal slot 3, and at each end with an arc-shaped lateral rib 4, having at each end a stop 5.

A plate is arranged in the opening; the said plate comprises a central circular portion 6 and radial extensions 7, each of which is longitudinally recessed as at 8, the recess registering with the slot 3 when the plate is in place. The plate is provided in its central portion 6, with a circular opening 9, having an annular groove 10 at its outer end.

A bushing 11 of hard metal is arranged in the opening 9, and an annular flange 12 is provided on the outer end of the bushing for engaging the groove. The bushing is also provided with a lug 13, which engages

a notch 14 in the wall of the opening, to prevent rotation of the bushing.

A lever 15 is provided for carrying the closing plate or shoe, which is in the form of a disk 16 of hard metal, and abuts against the outer end of the bushing when closed, as shown in Figs. 2 and 3. The lever 15 is provided near one end with a transverse opening 17, through which passes a bolt 18, having a head 19, which enters the slot 3 before mentioned.

It will be observed that the recess 7 is of less width than the slot 3, and the head 19 of the bolt engages beneath the plate, to prevent withdrawal of the bolt. The opening 17 is of greater diameter than the bolt, which fits loosely therein, and a nut 20 engages the bolt outside of the lever, a washer 21 being interposed between the nut and the lever.

The lever 15 is provided near its center with a substantially circular portion 22, having segmental notches 23 on opposite sides, and with a central recess 24, at the center of the circular portion. The end of the lever adjacent to the opening 17 is provided with an arc-shaped rib 30, struck on a circle whose center is the opening 17, and the rib moves against the rib 4, which is struck on a circle having the same center, and the lever is limited in its movement by the stops 5.

The opposite end of the lever is formed into a handle 25, having a transverse opening 26 at its outer end, and a longitudinal reinforcing rib 27 is provided on the outer face of the lever. On its inner face and on each side of the recess 24, a pair of diametrically opposite lugs 28 are arranged, and the closing plate 16 is provided with radial notches 29 for receiving the lugs, to retain the plate in place, and with segmental notches 29<sup>a</sup> registering with the notches of the lever.

A spring 31 is seated in the recess 24, and bears against the outer face of the closing plate to hold it against the end of the bushing. It will be evident from the description, that the lever is free to swing on the bolt 18, within the limits prescribed by the stops 5, and it may be reversed, the bolt being engaged with the recess 8 at the opposite end of the plate. The ends of the frame are alike, as are also the ends of the plate 6.

The face of the circular portion 6 of the



plate is smooth as indicated in Fig. 5, and is provided at one side with a keystone shaped enlargement 32, whose face is flush with the end of the bushing as shown in Fig. 3, and forms a bearing surface for the closing plate when the said plate moves from over the opening 33 in the bushing.

From an inspection of Fig. 1, it will be evident that the opening through the bushing is roughly triangular or pear-shaped, the largest end being upward, and the arrangement of the stops 5 is such, that when the lever is swung to open the gate, the said lever is stopped as soon as the bottom of the recess 23 clears the upper edge of the opening.

In less than a full and complete opening of the gate, the upper defining edge of the opening is always arc-shaped, so that the opening is approximately circular even with the smallest possible extent of opening movement of the lever, thus permitting the freest possible movement of the molten metal.

It will be evident that either the closing plate or the bushing may be easily removed when worn, without removing the frame 1, which is provided with apertures 35 for receiving bolts or rivets to connect it to the cupola. The closing plate is merely lifted from its seat after the removal of the lever, and the bushing may be easily removed from the plate.

When it is desired to reverse the position of the lever, the nut 20 is loosened, and the head of the bolt is slipped outwardly, until the bolt is disengaged from the recess 8. The head may then be drawn out through the slot 3, and removed to the opposite side.

I claim:—

1. A gate or cut-off for cupolas, comprising a frame for attachment to a cupola, said frame having a central opening, a longitudinal slot on each side of the opening, and an arc-shaped rib at each end, said rib having a stop at each end, a plate having a central portion fitting the opening, and a lateral extension at each side overlying the inner end of the slot of the frame, and having an end recess of lesser width than the frame, the plate having a central opening provided with an annular groove at its outer end, and a notch in its wall, a bushing fitting the opening and having an annular flange fitting the groove and a lug engaging the notch, a lever provided intermediate its ends with a substantially circular enlargement, and with a lug on its inner face on each side of the enlargement, and with a recess intermediate the lugs, said lever having an opening near one end, a bolt engaging the recess of the plate, and having a head fitting the slot of the frame, and passing through the opening of the lever, said lever having at the end adjacent to the bolt an arc-shaped rib moving against the rib of

the frame, and at the other end a handle, a disk seated on the inner face of the enlargement of the lever, having notches for engaging the lugs and segmental notches registering with the notches of the lever, and a spring seated in the recess and bearing against the disk, the enlarged portion of the lever having segmental notches in opposite sides registering with the opening of the bushing.

2. A device of the class described, comprising a frame for attachment to a cupola, and a plate seated in the frame and provided with a central opening, a bushing seated in the opening, said bushing having a lateral lug, and the wall of the opening a notch for engagement by the lug, a lever having a substantially circular enlargement intermediate its ends for closing the end of the bushing, and provided with segmental notches on each side of the enlargement for registering with the opening of the bushing, a closing plate detachably connected with the inner face of the lever, and having notches registering with the notches of the lever, means for detachably pivoting said lever to either end of the frame, and means at each end of the said frame for limiting the swinging movement of the lever.

3. A device of the class described, comprising a plate for attachment to a cupola, and provided with a circular opening, a bushing seated in the opening, the bushing being provided with a substantially pear-shaped opening and arranged with the large end of the opening upward, means for retaining the bushing in such position, a closing plate, means for normally holding said plate against the outer end of the bushing, and for moving it above or below the same, said plate having segmental notches in its upper and lower edges registering with the opening, and means for limiting the extent of movement of the plate.

4. A device of the class described, comprising a plate having an opening, means for connecting the plate to a cupola, a bushing in the opening, a closing plate for the bushing, supporting means for normally holding the plate against the end of the bushing, and for moving it to one side of the same, said plate having a segmental notch registering with the opening, when moved to one side of the bushing by the supporting means.

5. A device of the class described, comprising a frame for attachment to a cupola, a plate seated in the frame and having an opening therethrough, a bushing supported in the plate, a closing plate for the bushing, a lever for supporting the closing plate, means for pivotally connecting one end of said lever with either end of the plate, and means at each end of the frame for limiting the movement of the lever.



6. In a device of the class described, a frame for attachment to a cupola, a plate detachably seated in the frame, and having an opening therethrough, a bushing supported in the opening, a lever, means where-  
5 by said lever may be connected with either end of the frame, a closing plate for the bushing detachably connected with the lever, and a spring pressing the said plate toward  
10 the bushing.

7. In a device of the class described, a frame, a plate seated in the frame and having an opening therethrough, said plate having at each end a slot, a lever, a bolt arranged transversely of the lever at one end  
15 thereof and adapted to engage one of the slots, said bolt having a head for engaging

the under face of the plate, a closing plate seated in the lever, and a spring pressing the closing plate toward the plate of the  
20 frame.

8. In a device of the class described, a frame, a plate seated in the frame and having openings therethrough, said plate having at each end a slot, a lever, a bolt arranged  
25 transversely of the lever at one end thereof and adapted to engage one of the slots, said plate having a head for engaging the under face of the plate, and a closing plate detachably connected with the lever.

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Witnesses:

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