May 5, 1931. H. G. RETHERFORD ET AL 1,803,945

WELL CAPPER

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Fig. 1.

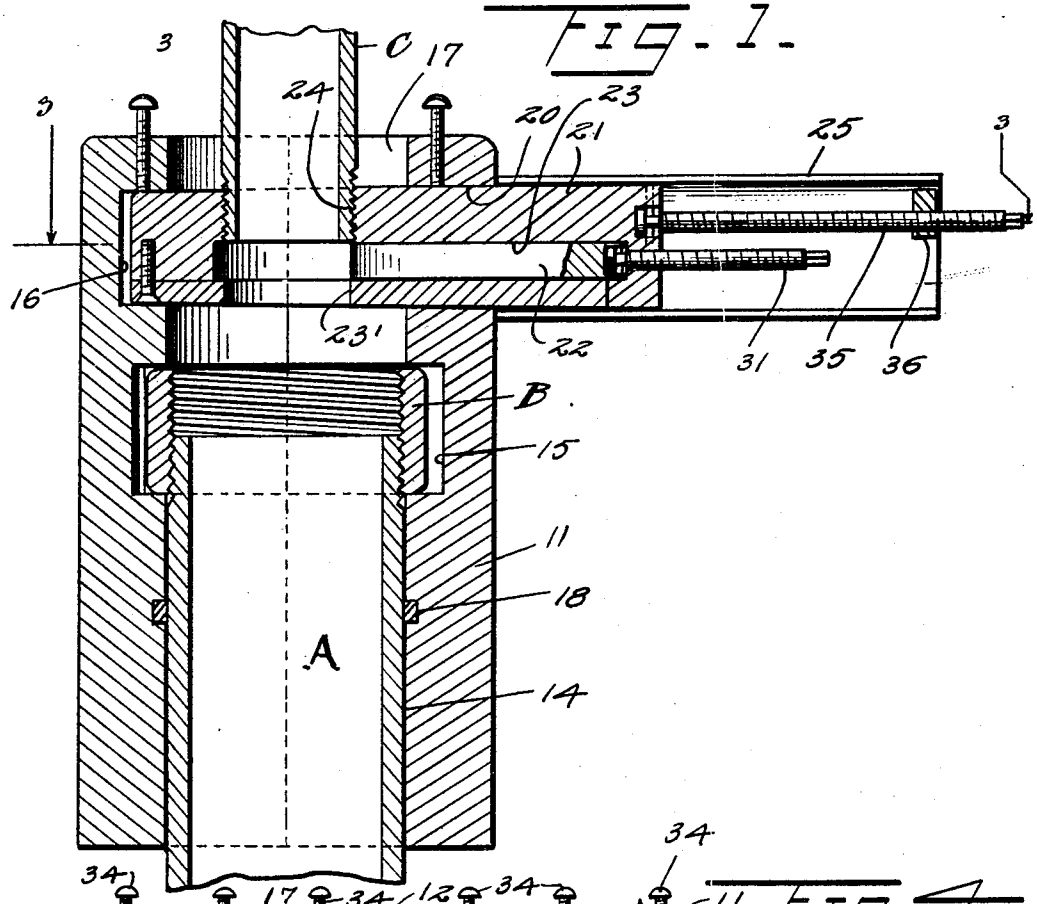
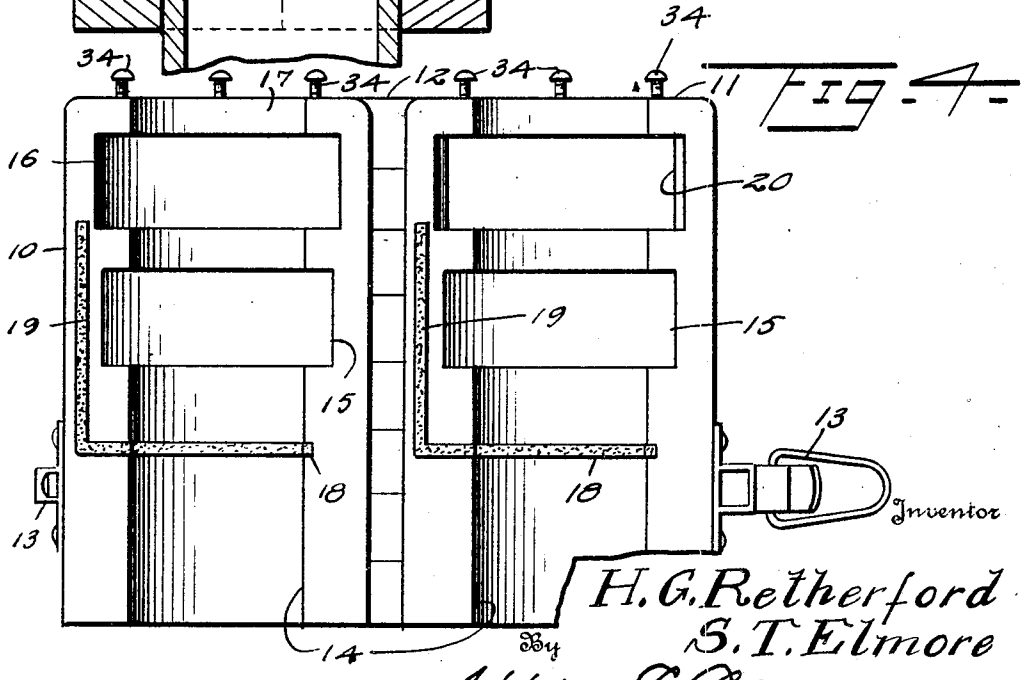


Fig. 4.



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FIG. 2.

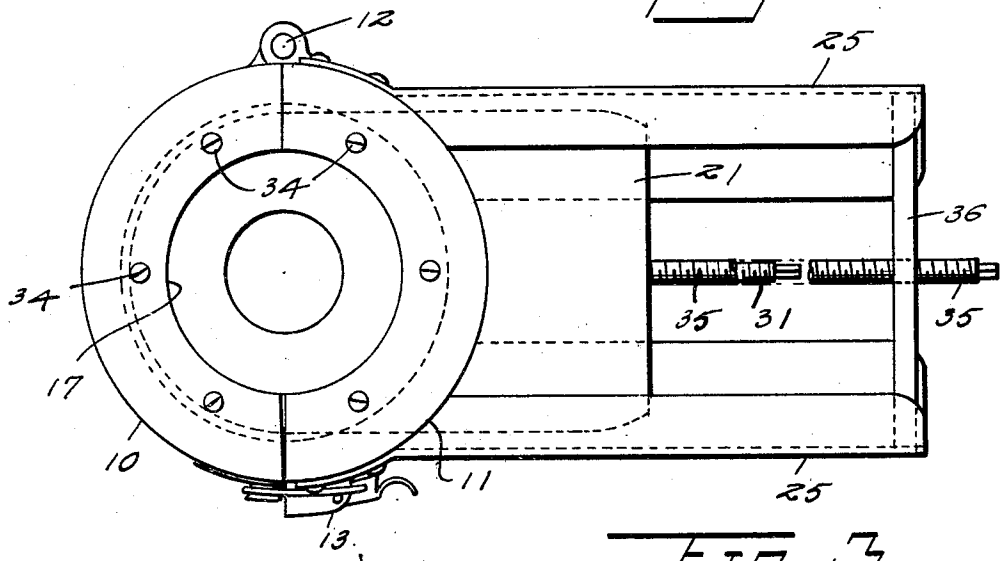


FIG. 3.

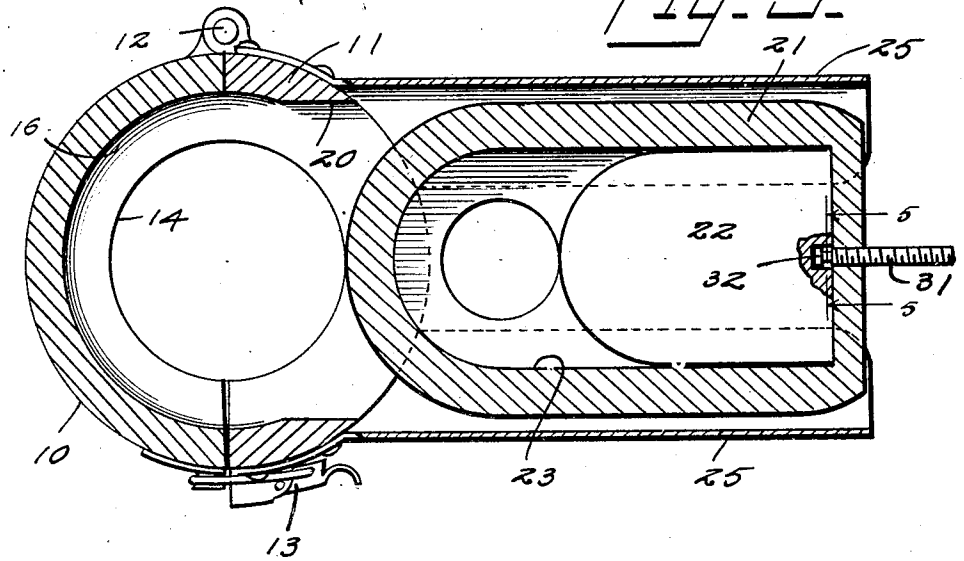
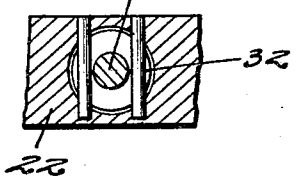


FIG. 5.



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Fig. 6.

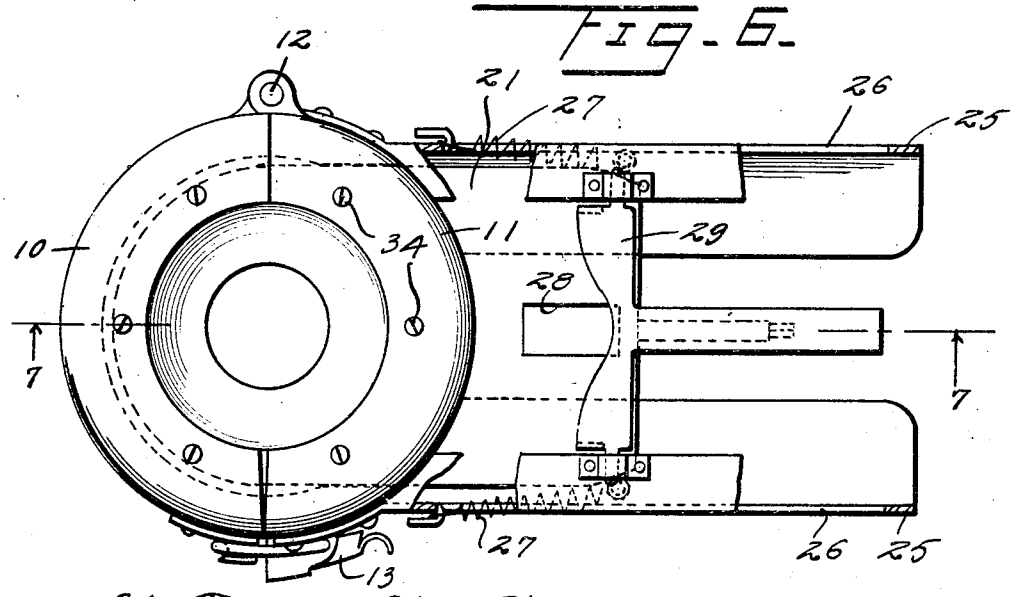


Fig. 7.

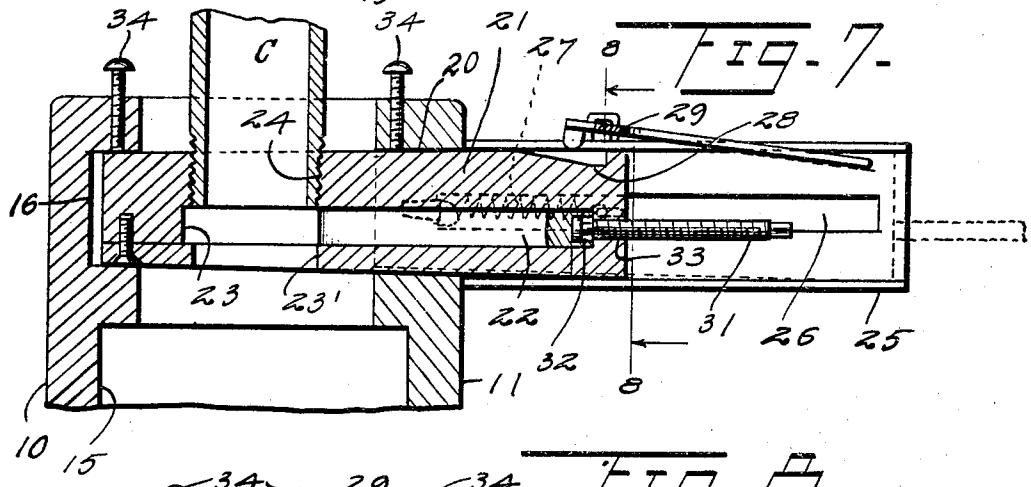
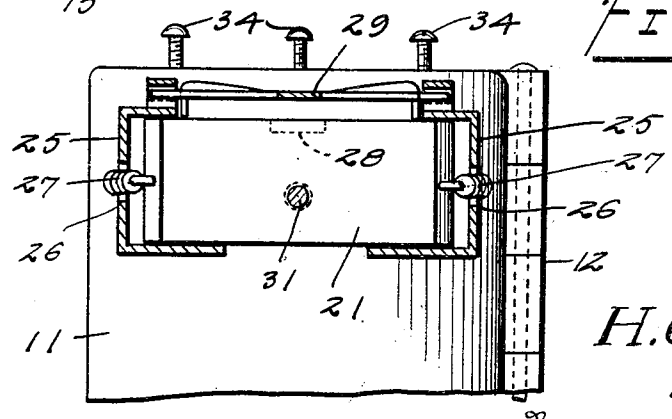


Fig. 8.



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UNITED STATES PATENT OFFICE

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WELL CAPPER

Application filed November 11, 1930. Serial No. 494,976.

This invention relates to oil or gas wells and particularly to capping means therefor whereby a wild well may be capped and the oil or gas directed into storage lines leading to storage tanks.

One of the objects of the present invention is to provide a capper of this character so formed that it will clamp around the well pipe even where the gas or oil is being forced out under high pressure without any obstruction to the pressure until the device is completely fastened to the well pipe, and provide means on the casing of the device whereby after a connection has been made to the storage tank, the well may be shut off, this construction embodying the use of two gates, a main gate which is provided with a screw-threaded opening and which is shiftable across the casing and across the direction of the flow of oil or gas, and a secondary gate disposed within the main gate and shiftable to cut off the passage of oil or fluid under pressure or permit the passage of oil or fluid under pressure.

Other objects have to do with the means for shifting the main gate and the secondary gate into their operative positions and the details of construction as will hereafter more fully appear.

Our invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view through a well capper constructed in accordance with our invention;

Figure 2 is a top plan view of the construction shown in Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is an elevation showing the casing of the capper opened;

Figure 5 is a fragmentary section on the line 5—5 of Figure 3;

Figure 6 is a top plan view of a modified form of a capper;

Figure 7 is a sectional view therethrough on the line 7—7 of Figure 1;

Figure 8 is a section on the line 8—8 of Figure 7.

In the drawings, we have illustrated two forms of our invention, in one of which the main gate is shifted by means of a spring after being released by a latch and in the other form of which the main gate is shifted by a screw.

Referring to Figures 1 to 5, it will be seen that we have provided a casing which is generally cylindrical in form and which is formed of two sections 10 and 11. These sections are hinged together at 12 so that the sections may be opened out or closed. The latching means 13 is provided whereby these sections may be held closed. The interior face of the casing is formed to provide the upwardly extending bore 14 opening into an enlarged cylindrical chamber 15. Above this chamber, the interior of the casing is formed to provide a circular seat 16 larger than the chamber 15 and designed for the reception of the main valve, as will be later stated. Above this seat 16 there is provided the bore 17. Below the chamber 15, the bore 14 is formed to receive a packing gasket 18, the confronting faces of the sections being formed to receive the packing 19. This casing is intended to be disposed around a well pipe A with the coupling B of the pipe disposed within the chamber 15 and it will be seen that when the two sections of the casing are closed upon each other, the gasket 18 will form a liquid and gas-tight joint around the well pipe and that the packing 19 will efficiently close the joint between the two sections.

The seat 16 is ground and slightly tapered and one side of the casing is cut away at 20, this opening 20 intersecting the seat, the seat being tapered from this opening 20 toward the opposite side of the casing. Movable into this tapered opening is the gate valve designated generally 21 and operating through this gate valve is a second gate valve 22, the main valve being chambered at 23 to provide a space within which this valve 22 may move. The main valve upon its opposite faces is formed with openings 23 and 24, the opening 24 having interior screw-threads whereby a storage tank pipe *c* may be engaged with the main valve when closed. Preferably the small gate valve 22 will also be slightly tapered so that

when thrust fully forward into position between the openings 23 and 24, it will tightly close but that when released, it may be readily withdrawn from beneath the opening 24. The main gate valve is movable between channeled guides 25. These guides in Figure 2 are shown as projecting from one of the sections 10 or 11 of the casing and as being longitudinally slotted at 26.

We have provided two means whereby the valves may be operated. In Figures 6, 7 and 8 we have shown for this purpose contractile springs 27 disposed within slots 26 and engaged at one end with the guides, the opposite ends of the springs being connected to the main valve 21 so that these springs will urge the main valve to a closed position.

In these figures we have shown for the purpose of holding the main valve in an open position against the action of the springs a recess 28 formed in the main valve and have shown as mounted upon the channel guides 25 the pivoted latch or pawl 29 having a tongue which is engageable in the recess 28 and which will hold the valve open against the action of the springs until this pawl 29 is tripped. This pawl may be tripped by any suitable means, as for instance, a cable or wire extending from a distance to the well so that when this is tripped, the springs 27 will act to force the main valve into place to cut off the well. The secondary valve 22 is movable by means of a screw 31 which is swiveled at 32 to the valve 22 and at its rear end has screw-threaded engagement as at 33 with the end of the chamber or recess within which the secondary valve operates. The extremity of this screw is to be provided with a squared head or like means whereby a wrench may be applied to turn the secondary valve.

Extending through the top of the casing are set screws 34 which when the main valve is in place may be turned to hold the main valve in place against any accidental opening movement.

In the use of the construction illustrated in Figures 6 to 8, when it is desired to control the flow of oil from the well by means of our capper, the two sections of the capper are opened and slipped around the casing of the well so that the chamber 15 will surround the pipe coupling B. The two sections are then closed and latched together. At this time, both valves are fully opened so that there is an unimpeded flow of oil or gas through the top of the capper. When we say that the two valves are open, we mean that the main valve is in an open position and, of course, as the secondary valve is mounted upon the main valve, it also is in an open position, but as a matter of fact the secondary valve has been so shifted as to close the opening 24 through the main valve. The latch 29 is then released, permitting the springs 27 to cause the closing of the main valve, thus cutting off the flow of oil. After the main valve has been closed, the pipe C is connected to the screw-threaded opening 24 and this pipe C connected in turn to the storage tank or caused to discharge to any other suitable place, and then the secondary valve is opened by rotating the screw 33 which withdraws this secondary valve and allows the oil or gas to pass on into the pipe C and thus to the storage tank or other desired place.

A preferable form of operating the valves is shown in Figures 1 to 5 where the main valve 21 is operated by means of a screw 35 having swiveled engagement with the main valve and having screw-threaded engagement with a crossed member 36 on the longitudinal guides 25.

The rear end of this screw is formed with a head to receive a long handled crank wrench which can be applied and manipulated a safe distance from the well. In this construction the latch and springs are omitted and the main gate is positively shifted inward by rotating the screw 36 just as the secondary gate is positively shifted inward or outward by rotating its screw.

It will be seen that we have provided a construction which is very simple, which can be readily applied to a well at any time, even when the well has gone wild and in which no effort is made to cut off the well until after the capper has been applied and engaged with the well casing. It will be noted that the valve cuts across the stream of oil or gas and cuts off the flow until the pipe leading to the storage tank has been applied, whereupon the secondary valve is opened to permit the flow through the capper.

We do not wish to be limited to the details of construction as it is obvious that many changes might be made without departing from the spirit of the invention as defined in the appended claims.

This capper is very strong, may be made of heavy castings, and therefore, will not be liable to break under the pressures to which it is submitted.

While we have illustrated this device as engaging a coupling, it may be also used on pipe either with or without the coupling, but usually the couplings are left extended upward on all well drilling jobs. In case the coupling is not left on, the two sections of the casing can be formed with teeth to be forced into the pipe A and hold the casing firmly in place.

We claim:—

1. An oil well capper comprising a casing formed of two hinged, semi-cylindrical sections, the casing being formed on the inte-

rior to receive and clamp upon the coupling on the upper end of a well pipe and have gas-tight engagement therewith, a main valve having a screw-threaded opening therethrough and slidable transversely across the casing to intersect an opening thereof or be withdrawn therefrom, and a second valve mounted on the main valve for movement toward or from a position closing the screw-threaded opening, and means to shift either of said valves independently of the other.

2. An oil well capper comprising a casing formed of two hinged semi-cylindrical sections, the casing being formed on its interior to receive and clamp upon the coupling of the upper end of a well pipe and have gas-tight engagement therewith, the casing being also formed to provide a valve seat and having an opening alining with the valve seat, guides mounted upon the exterior of the casing, a main valve slidable in said guides through said opening and into said seat or retractible therefrom, the main valve being formed with a chamber and having upper and lower openings intersecting said chamber, the upper opening being screw-threaded for engagement with a pipe leading to a storage tank and a secondary valve disposed within said chamber and shiftable across said openings to close the same, and means whereby the main valve may be held in a retracted position or shifted on to its seat and whereby the secondary valve may be retracted from across said openings or shifted into a position across said openings.

3. An oil well capper comprising a casing formed of two hinged semi-cylindrical sections, the casing being formed on its interior to receive and clamp upon the coupling of the upper end of a well pipe and have gas-tight engagement therewith, the casing being also formed to provide a valve seat and having an opening alining with the valve seat, guides mounted upon the exterior of the casing, a main valve slidable in said guides through said opening and into said seat or retractible therefrom, the main valve being formed with a chamber and having upper and lower openings intersecting said chamber, the upper opening being screw-threaded for engagement with a pipe leading to a storage tank, and a secondary valve disposed within said chamber and shiftable across said openings to close the same, and means whereby the main valve may be held in a retracted position or shifted on to its seat and whereby the secondary valve may be retracted from across said openings or shifted into a position across said openings, the valve seat being tapered from the opening in the casing and the chamber being tapered in a like direction whereby said main valve and secondary valves will close the passage through said casing when the main and secondary valves are shifted into their seats.

4. An oil well capper comprising a casing formed of two hinged semi-cylindrical sections, the casing being formed on the interior to receive and clamp upon the coupling upon the upper end of a well pipe and have gas-tight engagement therewith, the interior of the casing being formed to provide a valve seat and the wall of the casing being formed with an opening coinciding with the valve seat, channel guides extending outward on each side of said opening, a main valve slidable in said guides and through the opening and on to said seat, the main valve having a chamber formed therein for a secondary valve and having openings intersecting said chamber, the upper opening being screw-threaded, a secondary valve slidable through said chamber, the chamber constituting a seat for the secondary valve, means for shifting the secondary valve to or from its seat within the chamber, and means for shifting the main valve to its seat within the casing.

5. An oil well capper comprising a casing formed of two hinged semi-cylindrical sections, the casing being formed on the interior to receive and clamp upon the coupling upon the upper end of a well pipe and have gas-tight engagement therewith, the interior of the casing being formed to provide a valve seat and the wall of the casing being formed with an opening coinciding with the valve seat, channel guides extending outward on each side of said opening, a main valve slidable in said guides and through the opening and on to said seat, the main valve having a chamber formed therein for a secondary valve and having openings intersecting said chamber, the upper opening being screw-threaded, a secondary valve slidable through said chamber, the chamber constituting a seat for the secondary valve, means for shifting the secondary valve to or from its seat within the chamber and means for shifting the main valve to its seat within the casing, said means including springs urging the main valve to its seat, and a detachable latch holding the main valve in an open position.

6. An oil well capper comprising a casing formed of two hinged semi-cylindrical sections, the casing being formed on the interior to receive and clamp upon the coupling upon the upper end of a well pipe and have gas-tight engagement therewith, the interior of the casing being formed to provide a valve seat and the wall of the casing being formed with an opening coinciding with the valve seat, channel guides extending outward on each side of said opening, a main valve slidable in said guides and through the opening and on to said seat, the main valve having a chamber formed therein

for a secondary valve and having openings intersecting said chamber, the upper opening being screw-threaded, a secondary valve slidable through said chamber, the chamber constituting a seat for the secondary valve, means for shifting the secondary valve to or from its seat within the chamber, and means for shifting the main valve to its seat within the casing, said means comprising a cross bar carried by said channeled members, a screw having threaded engagement with the cross bar and swiveled engagement with the main valve.

7. An oil well capper comprising a casing formed of two hinged semi-cylindrical sections, the casing being formed on the interior to receive and clamp upon the coupling upon the upper end of a well pipe and have gas-tight engagement therewith, the interior of the casing being formed to provide a valve seat and the wall of the casing being formed with an opening coinciding with the valve seat, channel guides extending outward on each side of said opening, a main valve slidable in said guides and through the opening and on to said seat, the main valve having a chamber formed therein for a secondary valve and having openings intersecting said chamber, the upper opening being screw-threaded, a secondary valve through said chamber, the chamber constituting a seat for the secondary valve, means for shifting the secondary valve to or from its seat within the chamber, comprising a screw having swiveled engagement with the secondary valve and having threaded engagement with the main valve and extending out beyond the same, and means for shifting the main valve to its seat within the casing comprising a cross bar engaged with said guides and a screw having threaded engagement with the cross bar and swiveled engagement with the main valve, both of said screws having heads whereby they may be operated by wrenches from a distance.

In testimony whereof we hereunto affix our signatures.

HORACE G. RETHERFORD.
SAMUEL T. ELMORE.