A. C. MORTENSEN.

OIL WELL CAPPER.

APPLICATION FILED OCT. 18, 1910.

1,050,976.

Patented Jan. 21, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

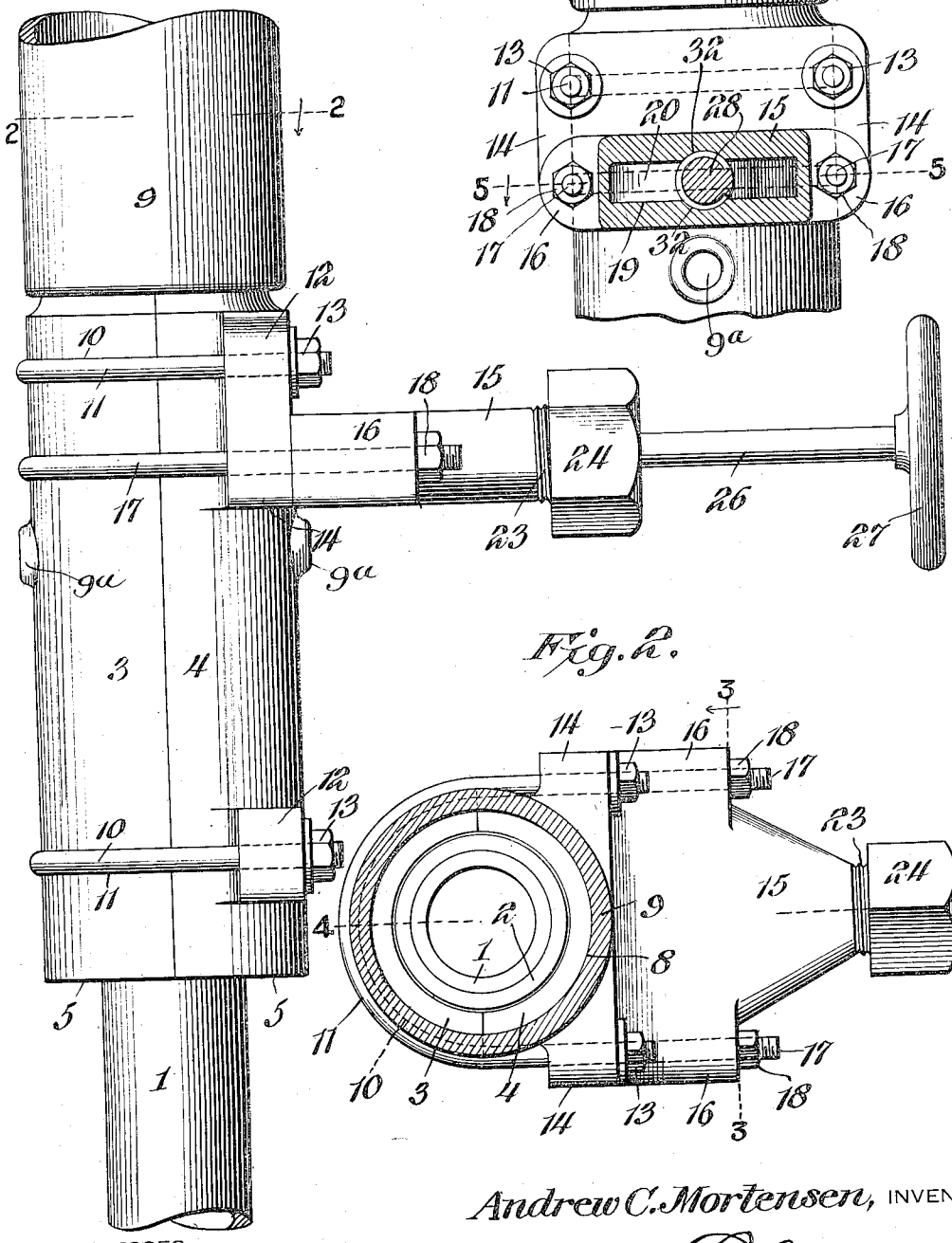


Fig. 3.

Fig. 2.

Andrew C. Mortensen, INVENTOR,

BY E. G. Siggers.

ATTORNEY

WITNESSES

Howard D. Orr.

F. T. Chapman

A. C. MORTENSEN.

OIL WELL CAPPER.

APPLICATION FILED OCT. 18, 1910.

1,050,976.

Patented Jan. 21, 1913.

3 SHEETS—SHEET 2.

Fig. 4.

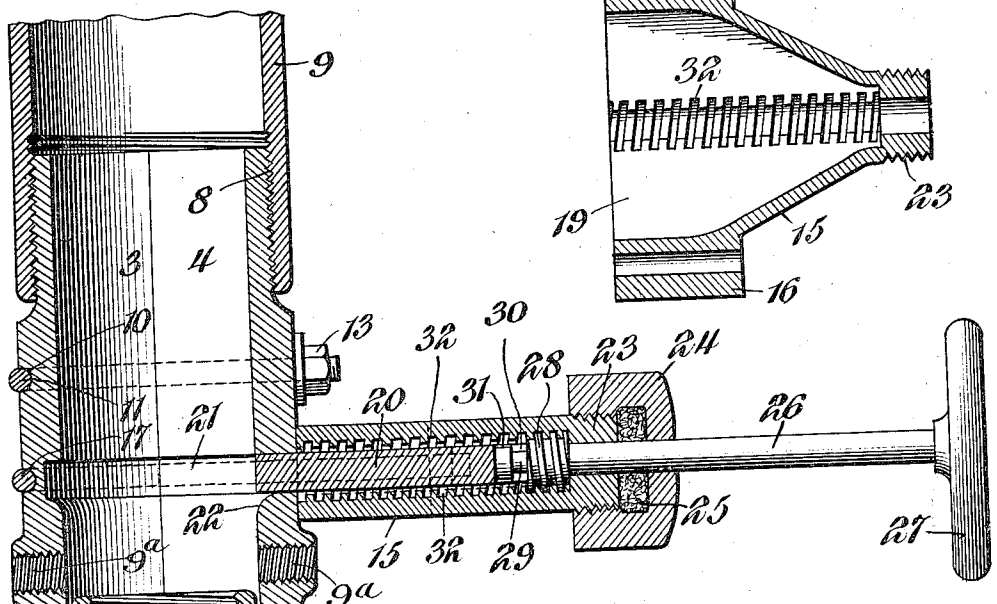
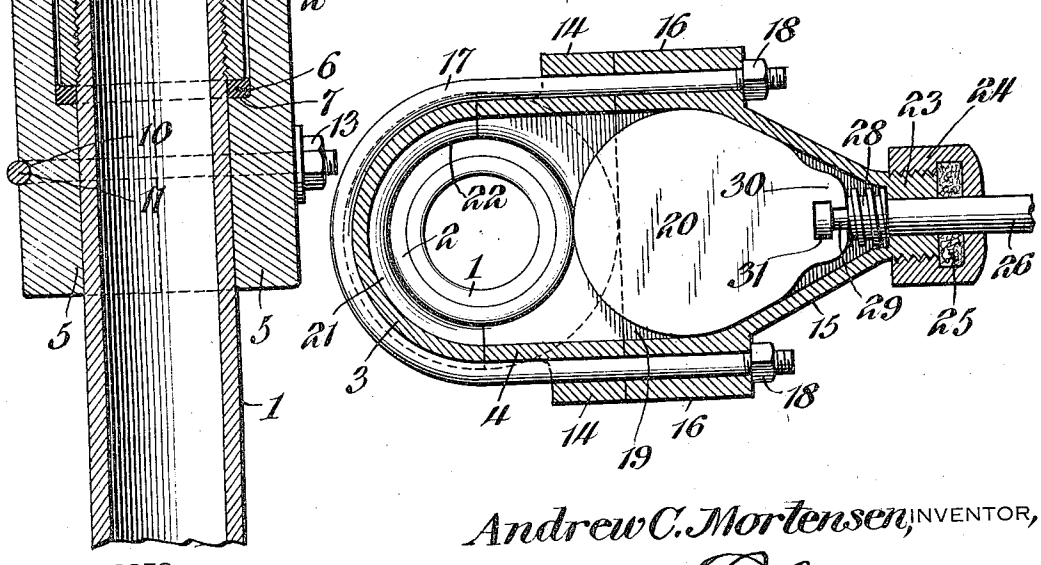


Fig. 6.

Fig. 5.



WITNESSES

Howard D. Orr.

F. T. Chapman.

Andrew C. Mortensen, INVENTOR,

BY E. G. Siggers.

ATTORNEY

A. C. MORTENSEN.

OIL WELL CAPPER.

APPLICATION FILED OCT. 18, 1910.

1,050,976.

Patented Jan. 21, 1913.

3 SHEETS—SHEET 3.

Fig. 7.

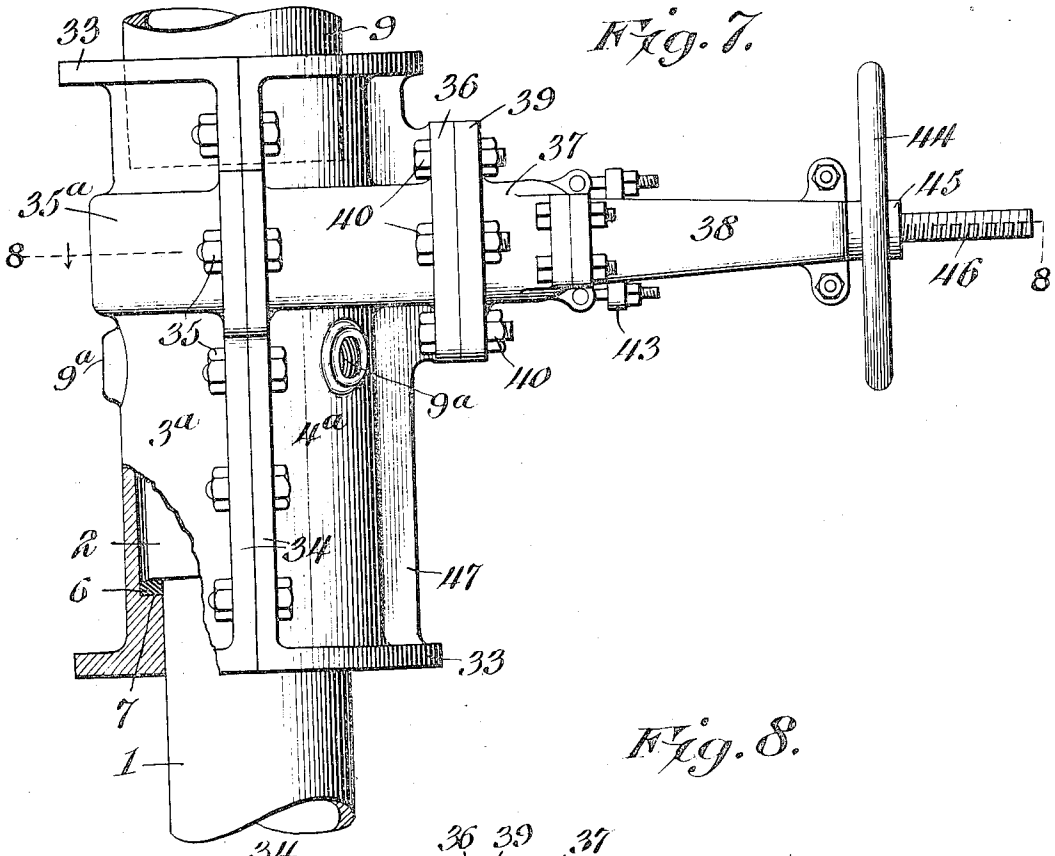
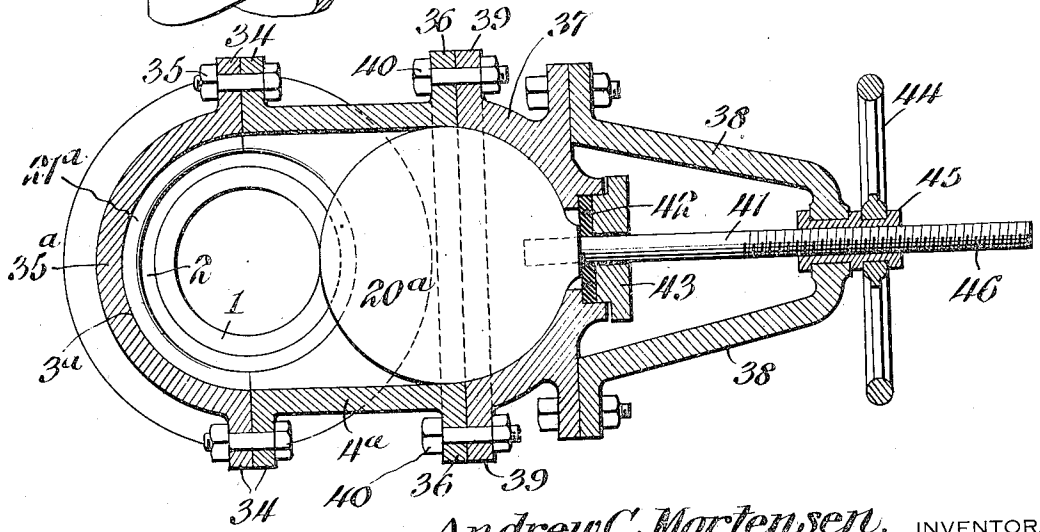


Fig. 8.



Andrew C. Mortensen, INVENTOR,

WITNESSES

Howard D. Orr.

F. T. Chapman.

BY E. G. Siggers.

ATTORNEY

UNITED STATES PATENT OFFICE.

ANDREW C. MORTENSEN, OF COALINGA, CALIFORNIA.

OIL-WELL CAPPER.

1,050,976. Specification of Letters Patent. Patented Jan. 21, 1913.

Application filed October 18, 1910. Serial No. 587,775.

To all whom it may concern:

Be it known that I, ANDREW C. MORTENSEN, a citizen of the United States, residing at Coalinga, in the county of Fresno and State of California, have invented a new and useful Oil-Well Capper, of which the following is a specification.

This invention has reference to improvements in well cappers, and is designed more particularly for the capping of oil wells of the type known as gushers.

It is the object of the present invention to provide a capping means which may be applied to the well tubing below the upper or discharge end thereof, and then moved so as to in part project above the upper end of the well tubing, and this capping means carries a cut-off valve or gate permitting the stopping of the flow, after which a suitable connecting pipe may be applied leading to a reservoir, so that when the gate is again opened, the flowing oil may be saved and stored.

In accordance with the present invention, the capping device is made in sections, so as to be readily applied about the well tubing below the upper end thereof, and this capping device is of a size permitting the movement of the capper longitudinally of the well tubing until arrested by the usual collar at the upper end of the well tubing, the parts being so proportioned that a gate member carried by the capping device will then be above the outlet end of the well tubing. The casing may be secured in operative condition by providing the casing with suitable matching flanges to be connected together by bolts, or the casing may be formed for the application of yoke members which may be readily applied in a manner to secure the casing members firmly together.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that while the construction shown in the drawings is an operative construction well adapted for the purposes of the invention, it is at the same time susceptible of various modifications and changes while still retaining the salient features of the invention.

In the drawings:—Figure 1 is an elevation of the capper as applied to an oil well tube. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a section on the line 5—5 of Fig. 3. Fig. 6 is a section of a portion of the valve carrying member, on the same plane as Fig. 5. Fig. 7 is an elevation of a modified form of the well capping structure. Fig. 8 is a section on the line 8—8 of Fig. 7.

Referring to the drawings, there is shown a well casing 1 which may be taken as indicative of that portion of the well casing projecting above the surface of the ground, or at least the accessible upper end of the well casing, and as is customary the outer end of this casing is provided with the usual sleeve 2 exterior to the casing.

The capping structure comprises two semi-tubular members 3, 4 having their meeting edges longitudinally disposed and in the same diametric plane when the two members 3 and 4 are brought together. The internal diameter of the associated semi-cylindrical parts 3 and 4 of the capping members is greater than the external diameter of the collar 2, and one end of each of the capping members is formed with an inwardly directed enlargement 5, which, when the capping member is applied to the pipe 1, closely hug the pipe, the internal diameter of the enlarged end of the capping member conforming quite closely to the external diameter of the pipe 1, and when the capping member is applied to the pipe 1, there is introduced a packing ring 6, which will be confined between the thickened portion 5 and the corresponding end of the collar 2, the said thickened portion forming a shoulder 7 adapted to engage the packing 6 and confine it against the collar 2. The capping member made up of the members 3 and 4 is of sufficient length to extend a considerable distance beyond the end of the tube 1 when the thickened portion 5 is brought into operative relation to the collar 2, and such extended end is formed with external screw threads, as indicated at 8, for the reception of a pipe 9 which may be continued to a suitable reservoir.

In the structure shown in Figs. 1 to 6, the member 3 has at appropriate points exterior recesses 10 produced in the outer wall of the member 3 in encircling relation thereto and designed to receive the appropriate portion of a U-shaped clamp rod or bolt 11.

The member 4 is provided at appropriate points with ears 12 through which the free ends of the legs of the U bolts extend, and beyond which these bolts receive nuts 13 designed to act through the bolts to draw the two sections 3 and 4 closely together at the meeting edges. Near the end of the member 4 remote from the enlargement 5 are other ears 14, having their outer surfaces tangent to the circumference of the member 4 and merging into the member 4, so there is provided a plane face for the application of a valve casing 15 of general rectangular shape in cross section, and wider than thick, this casing being provided with ears 16 in matching relation to the ears 14 and traversed by a U bolt 17 extending around the member 3 and in embracing relation thereto and through both the ears 14 and 16 and secured thereto by appropriate nuts 18. The bolts 17 are recessed into the members 3 and 4 in the same manner as are the bolts 11. Within the valve casing 15 there is formed a flat chamber 19 designed to receive a flat valve or gate 20, and the inner walls of the members 3 and 4 in line with the chamber 19 are formed with grooves 21 designed to receive the edges of the valve member 20, while those edges of the grooves 21 toward the enlargements 5 are rounded, as indicated at 22. The valve casing is contracted toward the outer end and is there formed with a threaded nipple 23 for the reception of a packing gland 24 inclosing suitable packing 25, and through this nipple there is a passage for a valve stem 26 terminating at the outer end in a hand wheel 27 by means of which the stem may be rotated. The stem 26 extends into the chamber 19 and is there formed with a short screw threaded section 28 and beyond this section with a headed extension 29 of smaller diameter than the threaded member 28. One end of the valve 20 is extended as shown at 30, and this extended portion is formed with an under-cut slot 31 designed to receive the headed extension 29 of the valve stem 26, so that the valve and stem are united for simultaneous travel, but the stem 26 may be turned without turning the valve 20. The opposite walls of the chamber 19 are provided with screw threads 32 in matching relation one to the other, and so related as to engage the threaded section 28 of the valve stem, so that when the valve stem is rotated, such stem and the valve will be propelled by the engagement of the threaded portion 28 with the screw threads 32, such screw threads engaging the threaded section 28 on opposite sides, but for only a portion thereof. The walls of the chamber 19 in which are formed the threads 32, and the edges of the grooves 21 are in line one with the other, so that these grooves serve to guide the valve 20 when moved under the action of the valve stem, the direction of movement of the valve being transverse to the longitudinal axis of the associated capping portions 3 and 4, making up the capping cylinder.

If it be desired to cap the well tube or pipe 1 while oil is gushing therefrom, the capper is applied by placing the members 3 and 4 about the pipe 1 below the collar 2 and by applying the bolts 11, after which the valve casing 29 may be secured by the bolt 17 with the valve 20 retracted and wholly withdrawn from the interior of the capper cylinder. Now, the capper may be moved in the direction of the length of the pipe 1 until the washer 6 is carried by the shoulder 7 into engagement with the collar 2, when the gate or valve 20 will be above the discharge end of the well tube 1. Now, by manipulating the hand wheel 27, the rod 26 may be turned in a direction to cause the valve 20 to move across the capper cylinder until seated in the recesses 21, and oil flowing from the well tube is stopped, while the pressure of the oil upon the under surface of the valve 20 will act to more firmly seat the enlargements 5 against the packing 6, and the latter against the collar 2. Now, the pipe 9 and connections therefrom to the reservoir may be applied to the upper end of the capping cylinder, after which the valve may be opened and the oil permitted to flow through the pipe 9 to the reservoir or other storage means. Should sand or grit reach the groove 21, the curved lower wall thereof will permit such sand or grit to gravitate away from the groove 21, thus maintaining the latter clear of all obstruction to the movement of the gate 20.

The capper comprises practically three members, the two semi-cylindrical body members and the valve casing, and these three parts are easily assembled about the tubing 1 when it is desired to cap such tube.

The well capper may be made of web construction, such as illustrated in Figs. 7 and 8. In this form the capping member is made of two parts, 3^a and 4^a, respectively, terminating at the ends in strengthening radial webs 33 and longitudinal webs 34 at the meeting edges, these webs being provided with matching perforations for bolts 35 by means of which the two parts 3^a and 4^a may be joined into a cylinder embracing the well tube 1. The two members 3^a and 4^a are formed with matching expanded portions 35^a, in which are formed recesses 21^a like the recesses 21 of Fig. 4, and the enlargement 35^a of the part 4^a is continued into a web 36 for the reception of a valve casing 37 having an extension 38. The valve casing 37 is formed with a web 39 matching the web 36, and these two webs are secured together by bolts 40. The casing 37 is entered by a valve stem 41 connected to a valve 20^a adapted to be moved

into traversing relation to the interior of the cylinder made up of the members 3ª and 4ª, and where the stem 41 enters the casing 37 there is provided a packing 42 and a gland 43 therefor. The extension 38 is designed to support a hand wheel 44, and a swivel nut 45 through which the valve stem 41 extends, being there screw threaded as indicated at 46, so that on turning the hand wheel the stem 41 and valve 20ª will be moved without the necessity of turning the stem 41. The section 4ª where carrying the valve casing is further strengthened by a web 47 extending longitudinally of the portion 4ª and merging into the web 36.

The capper of Figs. 7 and 8 is applied to the tube 1 in the same manner as described with reference to the capper of Fig. 1 and the operation is similar.

Under some circumstances when the pressure is great it is advantageous to lead the gas, oil or water directly to a main or reservoir from the space on the well side of the gate. For this purpose one or more tapped passages 9ª are provided through the walls of the sections 3 and 4 or both, so that by connecting suitable pipes thereto the gas, oil or water may flow into the main or to the reservoir as soon as the gate is closed, the stream being therefore not necessarily cut off at all by the use of the capper. When not in use the passages 9ª may be plugged.

What is claimed is:—

1. A well capper comprising a longitudinally divided two-part capping member of substantially constant internal diameter throughout for the major portion of its length and greater than the external diameter of the smooth portion of a well casing and collar thereon and at one end only of an internal diameter less than the external diameter of said collar, said capper being adapted for application to the smooth portion of the well casing below the collar and to be moved along the well casing to bring the portion of the capper of smaller diameter into engagement with the collar on the casing and with the capper projecting above the upper end of said collar, said capper being provided with cut off means and with means for holding the two members together after application to the well casing.

2. A well capper comprising a longitudinally divided two-part capping member of substantially constant internal diameter throughout for the major portion of its length and greater than the external diameter of the smooth portion of a well casing and collar thereon and at one end only of an internal diameter less than the external diameter of said collar, said capper being adapted for application to the smooth portion of the well casing below the collar and to be moved along the well casing to bring the portion of the capper of smaller diameter into engagement with the collar on the casing and with the capper projecting above the upper end of said collar, the capper at the end remote from the end of smaller diameter being provided with screw threads for the reception of a pipe, such screw threads being in non-interfering relation with either the well casing or the collar thereon, and said capper being provided with cutoff means and with means for securing the two parts together after application to the well casing.

3. A well capper comprising a longitudinally divided two-part capping member of substantially constant internal diameter throughout the major portion of its length and greater than the external diameter of the smooth portion of a well casing and collar thereon, and having one end only of an internal diameter less than the external diameter of said collar, said capper being adapted for application as a whole to the smooth portion of the well casing below the collar and to be moved along the casing until the portion of smaller diameter engages the collar, said capper being also provided with a valve in position to traverse the interior of the capper when in operative relation to the well casing to constitute a closure for said well casing and with means whereby the two parts of the capper may be secured together after application to the well casing.

4. A well capper comprising a longitudinally divided two-part capping member contracted radially at one end and at an intermediate point provided with a valve movable into and out of traversing relation to the interior of the capper, said capper being provided with means whereby the two parts may be secured together after application to the well casing and the inner walls of the capper being of substantially constant internal diameter from the contracted end to the other end and said capper being adapted for application to and movement along the smooth portion of a well casing and collar at the end thereof to bring the contracted end of the capper into abutting relation to the corresponding end of the collar with the valve above the collar.

5. A well capper comprising a longitudinally divided two-part member contracted at one end to embrace a well casing and collar at the upper end thereof and to be moved along the smooth part of said casing to bring the contracted end into engagement with the collar on said well casing, the capper being provided at an intermediate point with recesses for the reception of a valve, a valve casing adapted to be attached to the capper in line with the valve receiving recesses therein, and a valve and manipulating means therefor carried by the valve cas-

ing, said valve being adapted to be moved into traversing relation to the interior of the capper, and securing means for binding the two members of the divided capper together and for connecting the valve casing to the capper.

6. A well capper comprising a longitudinally divided two-part cylindrical member with one end of a diameter to embrace the smooth portion of a well casing and less than that of a smooth collar applied to the end of the well casing and from the said end of an internal diameter greater than that of said smooth collar, said capper having internal recesses for the reception of a valve with the walls of the recesses toward the end of the capper of reduced diameter rounded, one part of the capper member being formed with circumferential recesses and the other part with matching ears, means for connecting the two parts of the cylindrical member together, a valve casing having an internal chamber with longitudinal screw threads therein, a valve adapted to said chamber, and a valve rod provided with a threaded enlargement wholly confined to said chamber and adapted to the screw threads therein, said valve rod being connected to the valve and having a manipulating portion extending to the exterior of the valve casing.

7. A well capper comprising a longitudinally divided two-part cylindrical member with one end of a diameter to embrace the smooth portion of a well casing and less than that of a smooth collar applied to the end of the well casing and from the said end of an internal diameter greater than that of said smooth collar, said capper having internal recesses for the reception of a valve with the walls of the recesses toward the end of the casing of reduced diameter rounded, one part of the capper member being formed with circumferential recesses and the other part with matching ears, a valve casing having an internal chamber with longitudinal screw threads therein, a valve adapted to said chamber, and a valve rod provided with a threaded enlargement wholly confined to said chamber and adapted to the screw threads therein, said valve rod being connected to the valve and having a manipulating portion extending to the exterior of the valve casing, the capper member being provided with U-bolts for connecting its two parts together and for uniting the valve casing to the capper member.

8. A capper for oil wells provided with a valve and including two members shaped to embrace the smooth portion of a well casing wholly below the upper or discharge end of said casing, and then movable lengthwise of said casing and provided at one end with an internal shoulder of an internal diameter to coöperate with a collar at the upper end of the well casing to limit the movement of the capper toward the discharge end of said casing, and means for connecting the two members of the capper together.

9. A well capper comprising a longitudinally divided two-part capping member of an internal diameter greater than that of the smooth part of a well casing and a terminal collar thereon and also contracted at one end to an internal diameter less than the external diameter of the collar, and that end of the capping member remote from the reduced end being open to allow the passage of the collar freely therethrough, the capping member being also provided with a cut-off valve or gate, with means for securing the two parts together after application to the well casing and with passages through its walls on the well side of the gate, and said capping member being adapted for application to the smooth portion of the well casing below the collar and for movement along said well casing until the cut-off valve or gate is above the said collar.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ANDREW C. MORTENSEN.

Witnesses:
A. FULLER,
N. A. JOHNSON.