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G. B. ERVIN

TEMPORARY WELL CAPPER

Filed Feb. 16, 1927

Fig. 1.

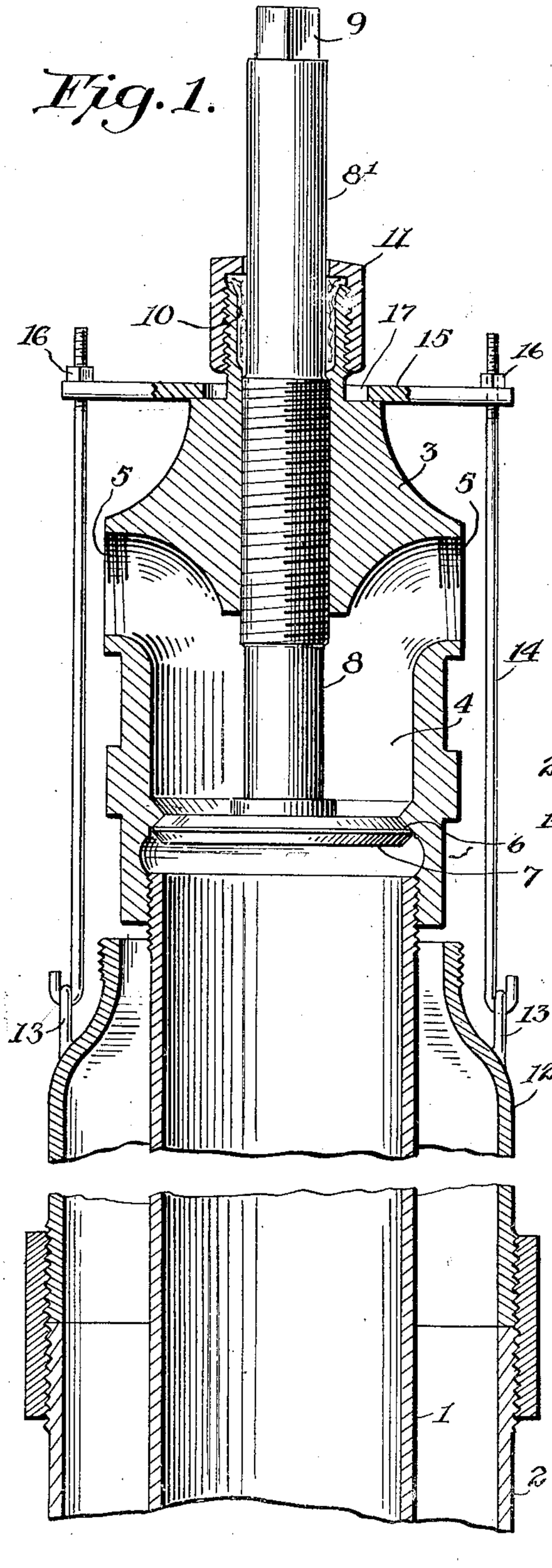
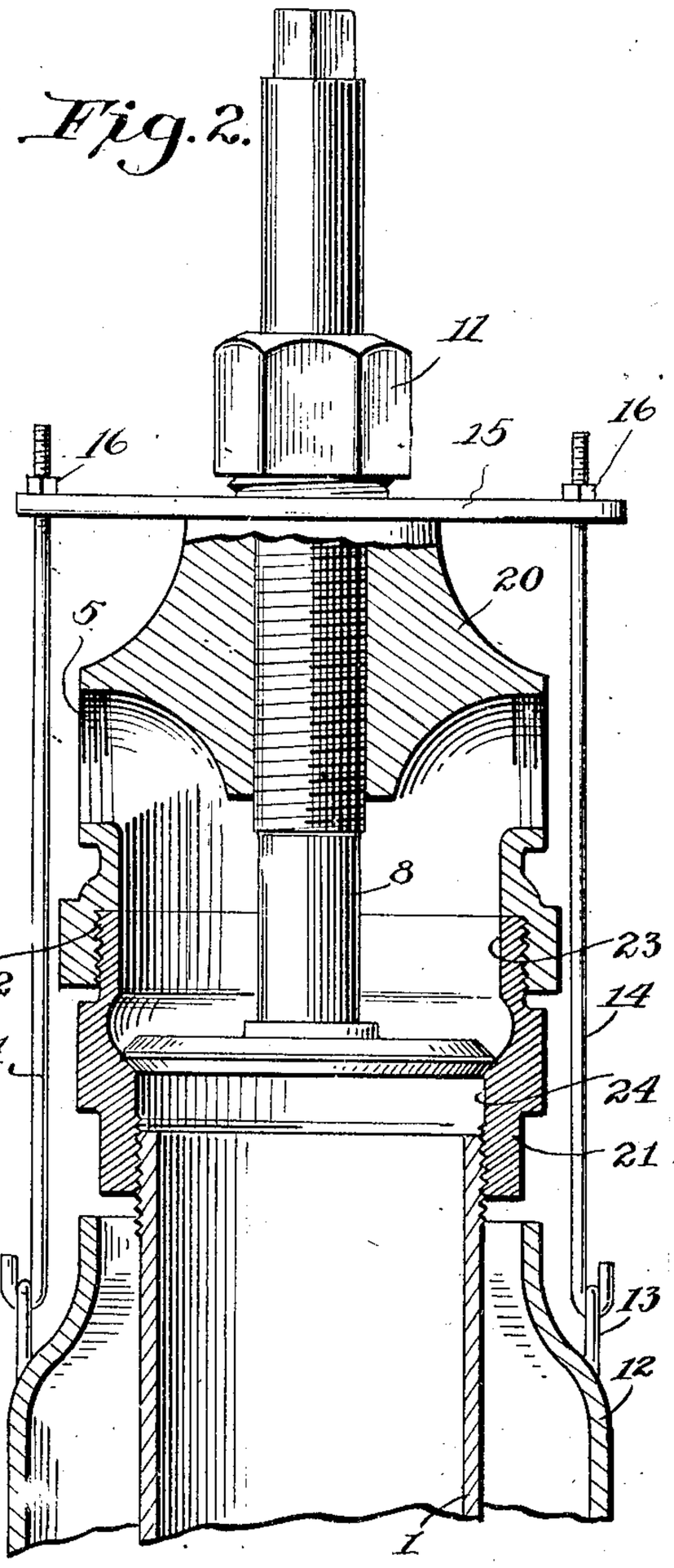


Fig. 2.



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UNITED STATES PATENT OFFICE.

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TEMPORARY WELL CAPPER.

Application filed February 16, 1927. Serial No. 168,679.

This invention relates to capping devices for oil and gas wells, but has special reference to the capping of gas wells and especially to high pressure gas wells.

The present invention is to be distinguished from ordinary well casing heads provided with valves or controllers, in that those devices are intended for permanent use so long as the well continues to flow, whereas the invention disclosed herein is intended for temporary use only and will be replaced by a permanent head when the well is ready for use.

In the practical working of gas wells it is desirable and usual to remove the well casings as soon as the well is bored, so that they may be used in boring other wells, the well tubing remaining in the ground for conducting the gas to the surface. If the gas is allowed to escape through this tubing while the casing is being drawn it is obvious that a great loss is incurred since several days may be required in removing the casing. Accordingly an object of the present invention resides in the provision of a temporary cap or head which may be readily applied to the upper end of the tubing, which provides for the passage of gas through the cap while being applied, and which includes means which may be readily operated to close the upper end of the tubing as soon as the cap is installed.

A further object of the invention consists of the provision of a cap having the foregoing advantages and which is nevertheless of sufficiently small diameter as to permit the well casing to be withdrawn upwardly past it.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawing; in which—

Figure 1 is a vertical section through the upper portion of a well showing the temporary capper in place; and

Figure 2 is a view similar to Figure 1 showing a slightly modified construction.

Referring to the drawing in greater detail the numeral 1 indicates the ordinary tubing of a well, and around which is disposed a well casing 2. As will be readily understood by those skilled in the art to which the present invention relates, it is the custom to employ casings of several diameters in boring wells, and the casing 2 just referred to is the casing of smallest diameter, the larger sized casings surrounding casing 2 not being shown in the drawing.

Threaded to the upper end of the well tubing and forming a gas-tight connection therewith is the improved capping device which includes the body member 3 provided with a central passage 4 and the laterally opening outlets 5. The body member 3 is provided with a valve seat 6 adapted for cooperation with a disc valve 7, to which is attached a valve stem 8. The stem 8 is threaded through the upper end of the body 3 and terminates in a squared end 9 for the reception of a wrench by means of which it may be rotated. The upper end of the body portion is provided with a threaded extension 10 to receive a packing gland 11 for cooperation with the extension 8′ of the stem 8.

It is desirable, where possible, to anchor the capper 3 and the tubing 1 to the casing, and to this end a nipple 12 provided with eyes 13 is threaded to the upper end of the casing 2. Through these eyes are engaged the hooked ends of rods 14, the opposite ends of said rods being passed through openings in the ends of a yoke 15 and secured thereto by nuts 16. By an inspection of Figure 1 it will be observed that the yoke 15 is provided with an opening 17 of greater diameter than the packing gland 11, thus permitting this member to be assembled after the capper is threaded to the tubing 1. This anchoring means for the capper and tubing is especially desirable in high pressure gas wells where there is grave danger of blowing out the entire tubing when the escape of gas therethrough is shut off.

Assuming that the well has been completed and that it is desired to remove the well casing; i. e., such casings as are of greater diameter than the casing 2: The valve 7 is first moved to open position and the body member 3 is then placed over the tubing with its passage 4 in alignment with the tubing. The body member is then threaded onto the upper end of the tubing, the high pressure gases escaping past the disc valve 7 and through the lateral outlets 5. The rods 14 are now engaged through the eyes 13 on the nipple 12, the yoke 15 seated on the body member with the ends of the rods passing through apertures therein and the nuts 16 applied. The valve 7 is then moved to closed position against its seat 6 and plugs (not shown) may be threaded into the outlets

5 if desired. The tubing 1 is now completely sealed and the operation of pulling the casings may be undertaken at will, the gas being retained in the well until such time as the casings are removed and a permanent cap or head placed on the tubing; it being noted that the capping device is free from lateral projections, thereby permitting the casing sections to be freely raised in the pulling operation.

Under certain circumstances such as where the gas pressure in the well is not too great, the anchorage to the casing 2 may be omitted and in that case the nipple 12 will not be applied to the casing 2 and this casing may also be pulled in the regular way, being readily slipped over the capping device 3.

The modified construction shown in Figure 2 is substantially identical with that previously described with the exception that provision is made in this form of the invention for the passage of a greater quantity of gas per unit of time. In this form the body member is formed of the upper and lower sections 20 and 21, threadedly connected as indicated by numeral 22, and the lower is of greater diameter at its upper end 23 than at its lower end 24. By this construction a larger valve 6 may be employed with the result that when the valve is open a larger passage is provided for the passage of the gas, thus facilitating application of the device to the tubing in a well having exceptionally high pressure. It will be understood that several different sizes of this lower section and the corresponding valves may be kept in stock, it being necessary only that the threaded lower ends 24 be of the same diameter.

From the foregoing description taken in connection with the accompanying drawings it will be apparent that I have devised an exceedingly simple and inexpensive construction for temporarily shutting off the discharge of gas from a well tubing; that provision is made for permitting the ready application of the device to the well tubing, that means are provided for securely anchoring both the tubing and the capping device; that it is readily adjustable to wells of different pressures, and that it is so designed as to permit the pulling of casings while retaining the tubing tightly sealed.

In accordance with the patent statutes I have described what I now believe to be the best embodiment of the invention, but I do not wish to be understood thereby as limiting myself or the scope of the invention, as many changes and modifications may be made without departing from the spirit of the invention; all such I aim to include in the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A capping device for well tubing including a body member, said body member provided with a central passage and one or more outlets, a valve seat formed on the inner wall of said passage, a valve for cooperation with said seat, a valve stem extending through the top of said body member, a packing gland for said stem, means for connecting said body member to the tubing, a nipple connected to the well casing, rods connected to said nipple, a yoke adapted to seat on said body member and provided with an opening to receive said packing gland, and means for securing the ends of said yoke to said rods.

2. A capping device for well tubing including a body member, said body member provided with a central passage and one or more outlets, a valve seat formed on the inner wall of said passage, a valve for cooperation with said seat, a valve stem extending through the top of said body member, a packing gland for said stem, means for connecting said body member to the tubing, a nipple connected to the well casing, eyes formed on said nipple, rods pivotally connected to said eyes by means of hooks formed on the lower ends of the rods, a yoke adapted to seat on said body member and provided with an opening to receive said packing gland and means for securing the ends of said yoke to said rods.

GEO. B. ERVIN.