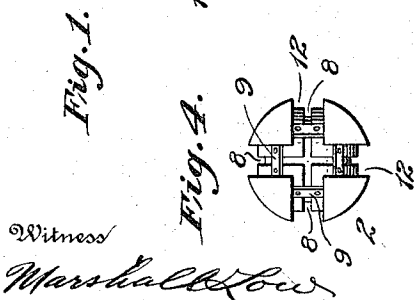
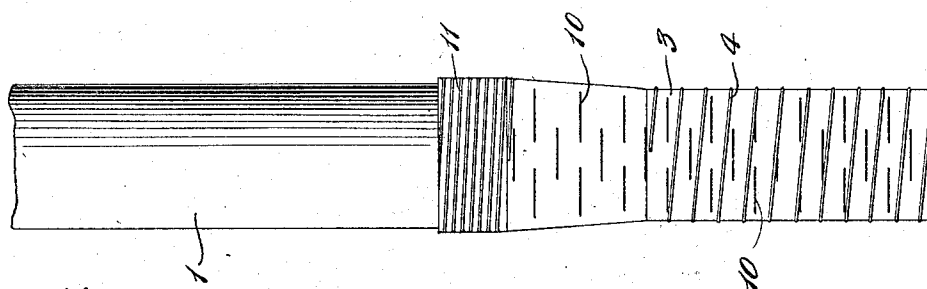
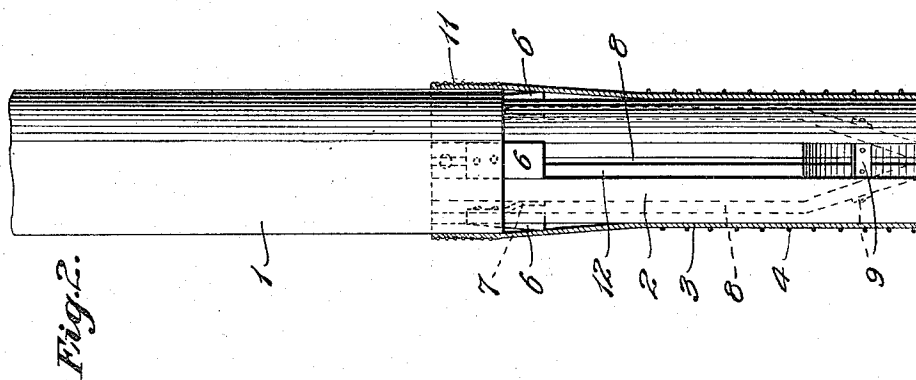
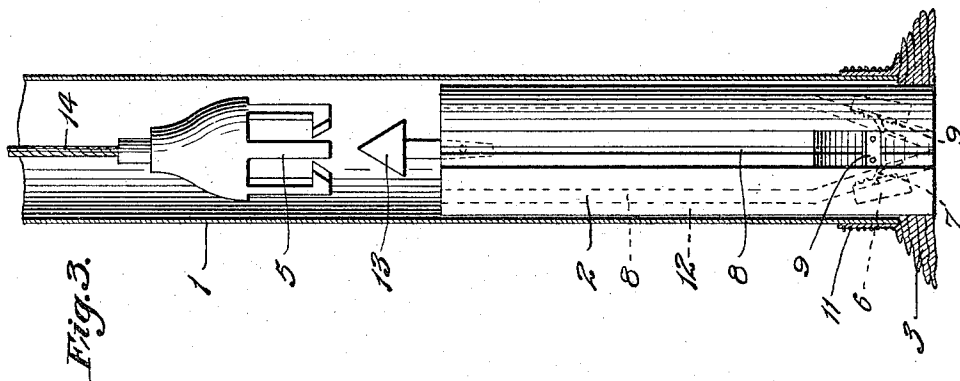


C. SWEET.
 WATER STOPPING DEVICE FOR OIL AND OTHER WELLS.
 APPLICATION FILED OCT. 24, 1914.

1,209,634.

Patented Dec. 19, 1916.



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UNITED STATES PATENT OFFICE.

CALVIN SWEET, OF HALF MOON BAY, CALIFORNIA.

WATER-STOPPING DEVICE FOR OIL AND OTHER WELLS.

1,209,634.

Specification of Letters Patent.

Patented Dec. 19, 1916.

Application filed October 24, 1914. Serial No. 868,516.

To all whom it may concern:

Be it known that I, CALVIN SWEET, a citizen of the United States, residing at Half Moon Bay, in the county of San Mateo and State of California, have invented new and useful Improvements in Water-Stopping Devices for Oil and other Wells, of which the following is a specification.

My invention relates to packers for oil and other deep wells such as are used for cutting off the flow of water between the casing and the wall of the well; and it has for its object to produce a packing and means for easily placing it in the well, as herein-
after described and pointed out, and as illustrated in the drawings, in which—

Figure 1 is an elevation of the lower end of a casing for a well with a packer embodying my improvements secured thereto and arranged for being lowered into the well. Fig. 2 is a view similar to Fig. 1, except that the packing is in section, thus exposing to view the parts which it incloses, as represented in Fig. 1. Fig. 3 is a vertical sectional view of the casing and packing compressed and expanded into well-packing position, the other parts being in elevation, and one of the securing wedges omitted. Fig. 4 is a bottom end view of the plunger that is employed for holding the packing expanded while being lowered into the well. Fig. 5 is a detail view of one of the securing wedges and the spring that it carries.

Referring to the drawings, 1 indicates the lower end of the casing which is preferably circular in cross section and of the kind commonly used in bored deep wells.

3 indicates the packing. It is a flexible sleeve, preferably formed of fibrous material, and is fitted over the casing, to the lower end of which it is tightly secured, as represented, by a cord or equivalent means, such as indicated at 11. The packing is tubular, and its lower end is secured to a plunger, 2, that is adapted to be inserted into the lower end of the casing, the plunger being of a size to nearly fill the casing but being sufficiently smaller than the casing to permit it to move freely therein. When the packing is to be applied one end thereof is

first secured to the casing, as indicated at 11, and then the plunger is inserted into the packing holding it distended, the packing being secured to the outside of the plunger by cord or the like, 4. This cord is applied in such a manner that it and the packing will be stripped off from the plunger whenever the latter is moved into the lower end of the casing.

In the plunger are formed a number of longitudinal channels, 12, preferably four, in which are located the wedges 6 that are employed to unite the plunger with the lower end of the casing. The channels, 12, incline inwardly toward the central longitudinal axis of the plunger at the lower end of the plunger, as indicated in Figs. 2, 3 and 4, so that when the wedges occupy these inclined parts of the channels, they are brought inward and away from the inner walls of the casing. Each wedge carries a spring 7—see Figs. 3 and 5—and these are adapted to occupy grooves, 8, formed in the bottoms of the channels, 12. They operate to force the wedges outward and into engagement with the inner wall of the casing.

9 indicates cross pieces located in the inclined portions of the channels, 12, and secured to the plunger, 2. They lie across the grooves, 8, and are adapted to have the springs, 7, carried by the wedges, pass under them when the wedges are caused to occupy the inclined portions of the channels, 12. They serve to prevent separation and loss of the wedges, 6. The plunger, 2, carries a conical or arrow-shaped head, 13, at its upper end, and this is adapted to be engaged by the claws of a grab hook, 5, at the end of a cord, 14, which is let down into the casing when the plunger is to be withdrawn.

Having thus briefly described the several parts of the packing and the means employed to place it, I will state how it is used. The well having been bored to a certain depth and conditions there encountered which make it desirable to pack the well, the packing, 3, is placed over the lower end of the casing, 1, and tightly secured thereto, as by the cord, 11. A plunger, 2, is inserted into the packing, over which it is stretched, a set of

wedges, 6, having first been seated in the channels, 12, with the springs occupying the grooves, 8. The packing is secured to the plunger by a cord, 4, that will temporarily hold it in position, but will not prevent the packing being stripped off the plunger when the latter is drawn into the casing. The parts being secured together as described, the plunger is drawn out into the position indicated in Figs. 1 and 2, extending the packing. The wedges engage with the inner wall of the casing and serve to unite the latter and the plunger. The parts thus assembled are lowered into the well until the bottom of the hole is reached, where the packing is to be applied. The lower end of the plunger is the part first to come into engagement with the bottom of the well hole. Its motion is thereby arrested, while the casing continues to move downwardly, compressing the packing which is gradually stripped from off the plunger as the latter moves into the casing. As the casing moves downwardly the wedges are carried with it, sliding in the channels, 12. When the casing ceases to move downward the grab hook, 5, is dropped down within the casing and engages with the head, 13, at the upper end of the plunger. Having engaged this it is drawn upward, carrying with it the plunger which is entirely stripped from the packing, the latter being left secured to the casing and in a compressed condition, such as indicated in Fig. 3. As the plunger is moved into the casing the wedges move into the tapering or inwardly inclined lower portions of the channels, 12, and are thereby caused to disengage the walls of the casing, the plunger thus being freed so that it can be easily taken out of the well. As the wedges approach the lower ends of the channels, 12, entering the inclined portions thereof, the springs, 7, pass behind the cross pieces, 9, and are thereby held from separation from the plunger so that they are carried out of the well along with the latter. The well being thus packed boring can be continued without interference from the water which is cut off by the packing, and in time a second section of casing added, as is common in the sinking of deep wells.

The means for placing the packing herein described are simple in construction and efficient in operation. The packing may be of any suitable material that will, under compression, fill the space between the casing and the walls of the well, and when made of fibrous substance is preferably slit, as indicated at 10, to facilitate its expansion laterally, as indicated in Fig. 1.

What I claim is:—

1. In a packing device for oil well casings, the combination of a flexible sleeve packing attached to the lower end of the casing, means arranged inside the casing for hold-

ing the packing extended while being lowered into the well, and means for withdrawing the said holding means and leaving the packing free to be distended by the weight of the casing.

2. In a packing device for oil well casings, a flexible sleeve packing attached to the lower end of the casing, means movable within the casing and arranged to project below the lower end thereof and hold the packing in an extended condition while being lowered into the well, the said means being free to move into the casing when they come into engagement with the bottom of the well, thereby causing the packing to be laterally distended and assume packing conditions, and means for withdrawing said means upward through the casing.

3. In a packing device for oil well casings, the combination of a flexible sleeve securely attached to the lower end of the casing, a plunger slidably disposed in the end of the casing and adapted to extend beyond the lower end thereof, means for securing the packing sleeve to the portion of the plunger that extends beyond the lower end of the casing, arranged to permit the sleeve being stripped off from the plunger when the latter is forced into the casing upon contact with the bottom of the well, and means for withdrawing the plunger from the casing.

4. In a packing device for oil well casings, the combination of a flexible sleeve attached to the lower end of the casing, a plunger slidably disposed in the lower end of the casing, provided with longitudinal channels, wedges slidable in said channels to secure the plunger to the lower end of the casing, means to slidably attach the packing to the plunger, and means to withdraw the plunger from the casing.

5. In a packing device for oil well casings, the combination of a flexible sleeve attached to the lower end of the casing, a plunger movable through the casing, provided with longitudinal channels that converge inwardly at the lower end of the plunger toward the longitudinal axis thereof, wedges mounted in the said channels and arranged to secure the said plunger to the lower end of the casing with its lower portion extending beyond the said lower end, means for securing the packing to the plunger, adapted to be stripped off when the plunger is moved into the casing, and means for withdrawing the plunger from the casing.

6. In a packing for oil well casings, the combination of a flexible sleeve attached to the lower end of the casing, a plunger slidably disposed within the casing and adapted to extend beyond the lower end thereof, in order to hold the packing in an extended condition while being lowered into the well, the plunger being provided with longitudinal channels, springs behind the wedges for

holding them outward in engagement with the inner wall of the casing, whereby the wedges secure the plunger to the lower end of the casing, and means for withdrawing
5 the plunger from the casing, leaving the packing free to be laterally distended for engagement with the walls of the well.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CALVIN SWEET.

Witnesses:

JOSEPH RUE,
ALLEN LOUARN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D C."