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PATENTED DEC. 17, 1907.

W. B. DAUGHERTY.
OIL WELL PACKING.

APPLICATION FILED JULY 29, 1907.

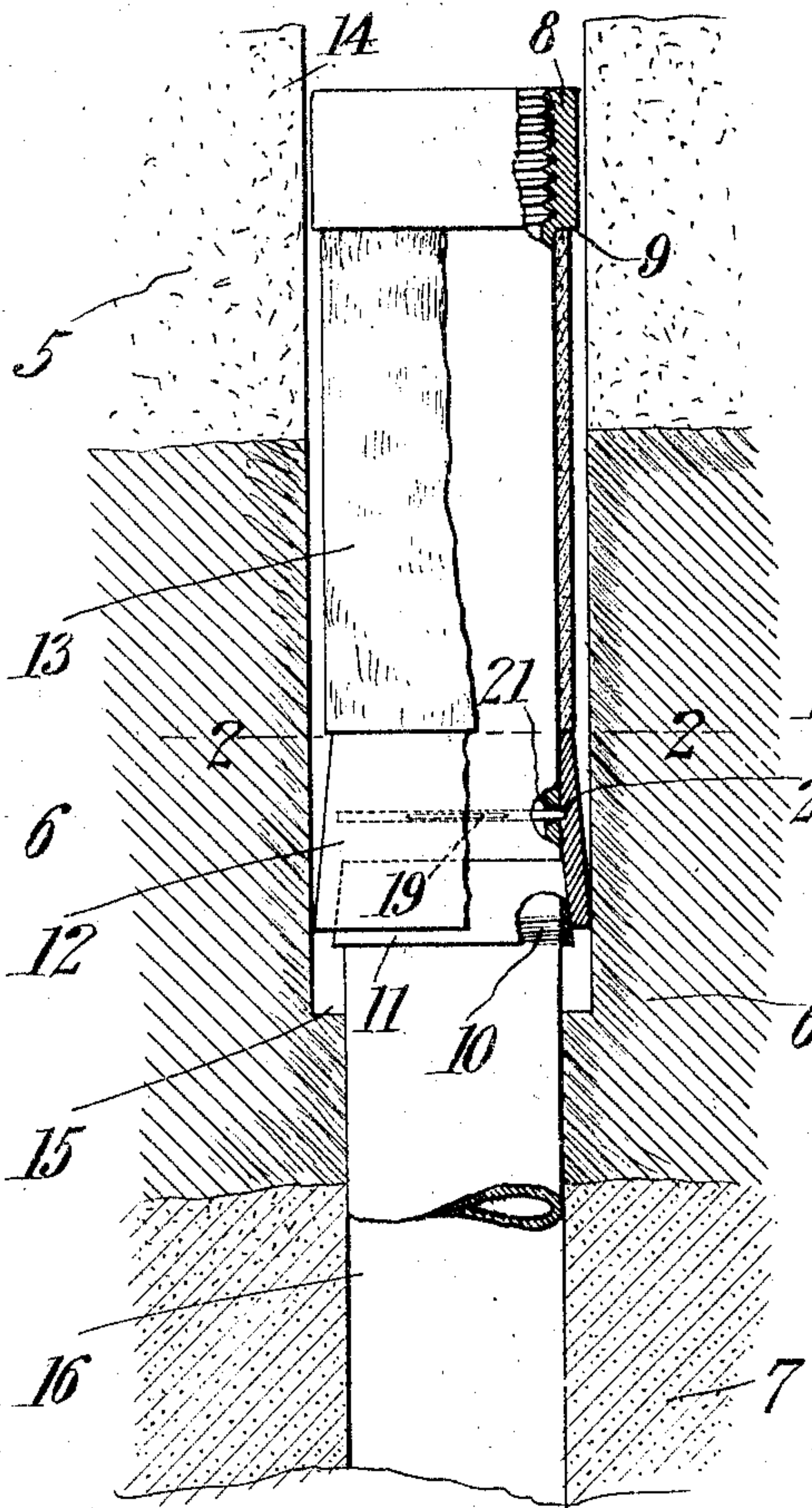


Fig. 1.

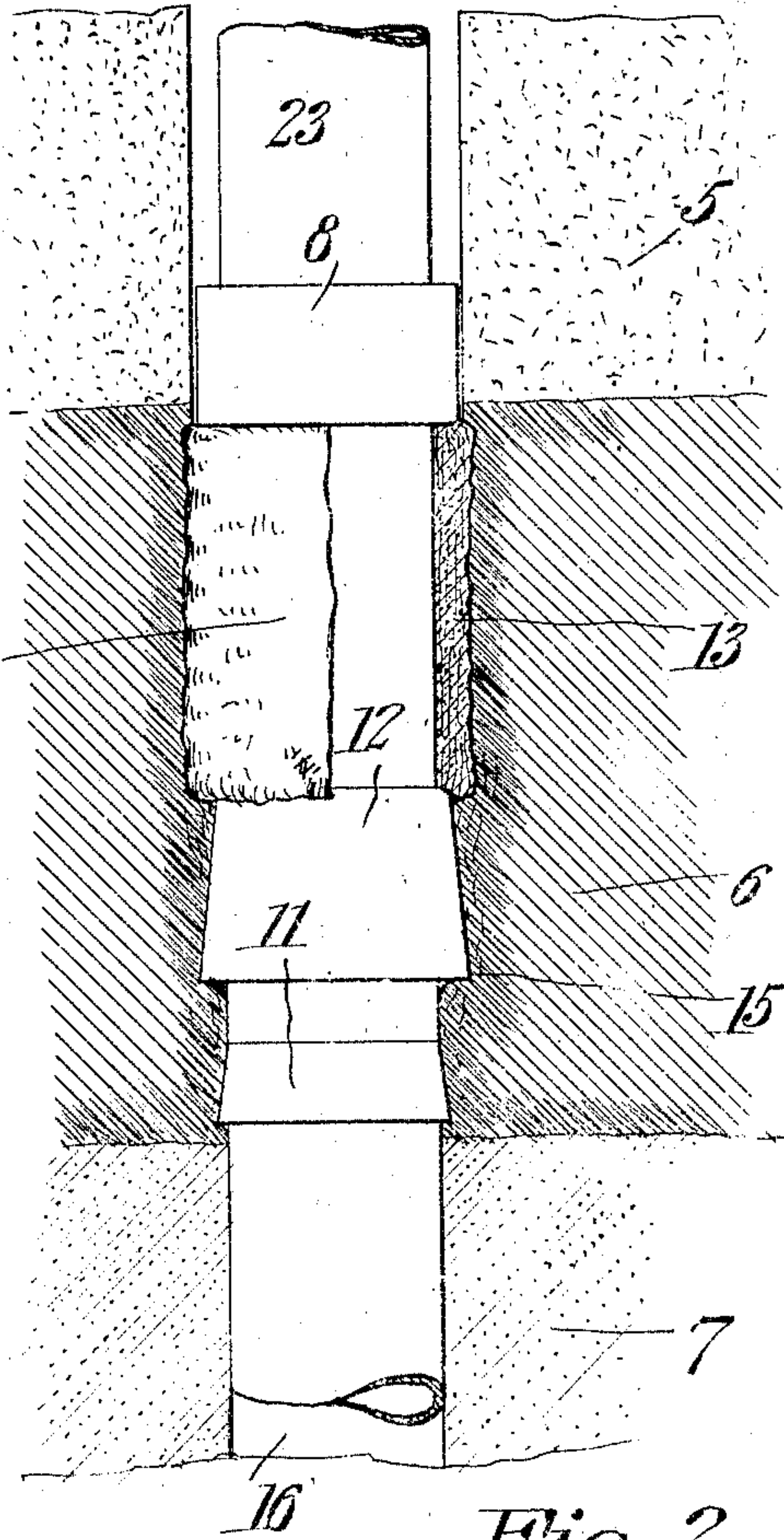


Fig. 2.

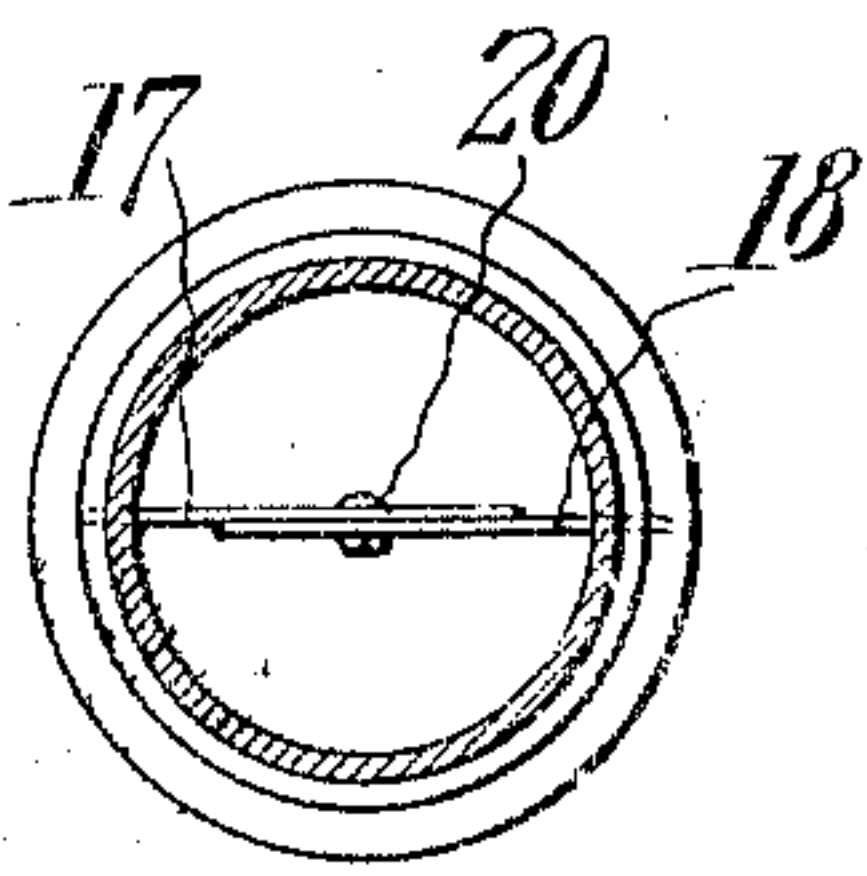


Fig. 3.

WITNESSES:

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WARREN BRIGGS DAUGHERTY, OF SAN LUIS OBISPO, CALIFORNIA.

OIL-WELL PACKING.

No. 873,995.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed July 29, 1907. Serial No. 386,041.

To all whom it may concern:

Be it known that I, WARREN BRIGGS DAUGHERTY, a citizen of the United States, residing at San Luis Obispo, in the county of San Luis Obispo and State of California, have invented a new and useful Oil-Well Packing, of which the following is a specification.

This invention relates to packing for oil wells and has for its object to provide improved means for packing the exterior walls of the well casing thereby to prevent the passage of water from an upper stratum of water bearing sand to a lower stratum of oil bearing sand during the operation of sinking a well.

A further object is to provide a flexible jacket or packing which surrounds the well casing and is compressible laterally into engagement with the walls of the hole beneath the water carrying stratum.

A further object is to provide a sliding shoe or collar adapted to bear against the adjacent end of the jacket or packing and effect the expansion of the packing when the casing is positioned within the hole.

A still further object of the invention is to generally improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification: Figure 1 is a vertical sectional view of a packing constructed in accordance with my invention showing the same in position on a well casing, the packing being in normal or inoperative position. Fig. 2 is a similar view showing the jacket or packing expanded and in engagement with the walls of the hole. Fig. 3 is a transverse sectional view taken on the line 2-2 of Fig. 1.

Similar numerals of reference indicate corresponding parts in all of the figures of the drawings.

The improved packing forming the subject matter of the present invention is principally designed for use in connection with oil wells for preventing the passage of water from an upper water bearing stratum 5 through the intermediate clay stratum 6 to the oil bearing stratum 7.

The upper end of one of the sections of the well casing is formed with an annular enlargement 8 defining a stop shoulder 9 while the exterior walls of said section at the lower end thereof are provided with circumferential threads 10 for engagement with the correspondingly threaded walls of a conical shaped bearing sleeve 11.

Slidably mounted on the casing and bearing against the sleeve 11 is a shoe 12 the interior walls of which are inclined to correspond to the inclination of the sleeve 11 thereby to prevent downward movement of the shoe on the well casing.

Surrounding the casing and interposed between the stop shoulder 9 and upper edge of the shoe 12 is a flexible packing or jacket 13 adapted to be compressed laterally in engagement with the walls of the hole 14 at the clay bearing stratum 6 thereby to prevent the water from the upper stratum 5 from flowing downwardly over the exterior surface of the well casing to the lower oil bearing stratum 7.

The lower end of the shoe 12 is arranged in the path of a shoulder 15 formed by the reduced bore 16 of the hole or opening 14 so that when the shoe comes in contact with the shoulder 15, said shoe will be forced in engagement with the packing or jacket 13 and thus effect the expansion of the same.

As a means for locking the shoe against accidental displacement when positioning the casing in the hole or opening 14 there is provided a transverse locking member preferably formed in two sections 17 and 18 having their adjacent ends over-lapped and provided with elongated slots 19 for the reception of a clamping bolt 20.

The outer ends of the locking members or bars 17 and 18 extend through suitable openings 21 in the well casing and fit into correspondingly shaped sockets 22 formed in the shoe 12 thus locking the shoe in position on the well casing.

In sinking a well the hole or opening 14 is formed with the reduced portion 16 at the point where it is desired to shut off the flow of water from the upper water carrying stratum to the lower oil bearing stratum.

The jacket or packing 13 is then placed in position on one of the casing sections with the shoe 12 engaging the conical sleeve 11 and with the locking members 17 and 18 extending transversely across the well casing and seated in the sockets 22.

The casing section is then positioned within the hole 14 and moved longitudinally of the latter until the lower end of the shoe 12 engages the stop shoulder 15 formed by the reduced bore 16 of the hole or opening, after which a bailer or other suitable tool is inserted through the upper end of the well casing and the locking members 17 and 18 released from engagement with the shoe. An additional casing section 23 is then threaded on the jacket carrying section and said jacket carrying section forced longitudinally within the opening or hole 14.

As the jacket carrying section is moved longitudinally of the opening 14 the upper edge of the shoe 12 will bear against the adjacent edge of the flexible jacket or packing 13 and compress the latter against the stop shoulder 9 thus causing the jacket or packing to expand laterally in engagement with the walls of the hole or opening 13 at the clay stratum 6 so as to effectually prevent the passage of water around the exterior walls of the casing at said clay bearing stratum.

Attention is here called to the fact that the tapered sleeve 11 serves to lock the shoe 12 in the proper position on the well casing preparatory to introducing the locking members 17 and 18, while said locking members prevent the shoe from riding upwardly on the well casing and prematurely expanding the casing or packing should the shoe engage an obstruction in the hole or opening 14 when positioning the casing within said hole.

By making the shoe and collar detachable the same may be readily applied to any particular casing section.

From the foregoing description it will be seen that there is provided an extremely simple, inexpensive and efficient device admirably adapted for the attainment of the ends in view.

Having thus described the invention what is claimed is:

1. A packing for oil wells including a casing provided with a stop shoulder, a tapered sleeve secured to the casing, a correspondingly tapered shoe slidably mounted on the sleeve, and an expansible jacket interposed between the shoulder and shoe and movable to expanded position by engagement with said shoe.

2. A packing for oil wells including a casing provided with a stop shoulder, a relatively stationary tapered sleeve secured to the casing, a correspondingly tapered shoe slidably mounted on the sleeve, a compressible jacket surrounding the exterior walls of the casing and interposed between the stop shoulder and shoe, respectively, and means for lock-

ing the shoe against longitudinal movement on the casing.

3. A packing for oil wells including a casing provided with a stop shoulder, a relatively stationary conical bearing sleeve threaded on the exterior walls of the casing, a correspondingly tapered movable shoe bearing against tapered walls of the sleeve, and an expansible jacket interposed between the stop shoulder and shoe, said jacket being movable to expanded position by engagement with the shoe.

4. A packing for oil wells including a casing having one end thereof provided with a stop shoulder and its other end formed with exterior threads, a relatively stationary conical bearing sleeve engaging the threaded walls of the casing, a correspondingly tapered shoe bearing against the sleeve, and an expansible jacket interposed between the stop shoulder and shoe and movable to expanded position by engagement with said shoe.

5. A packing for oil wells including a casing provided with a stop shoulder and having oppositely disposed openings formed therein, a tapered sleeve secured to the casing beneath the openings, a shoe slidably mounted on the casing and provided with sockets adapted to register with the openings in the casing, locking members extending transversely of the casing and having their inner ends united and their outer ends projected through the openings for engagement with the sockets, and a compressible jacket interposed between the stop shoulder and shoe and movable to expanded position by engagement with said shoe.

6. A packing for oil wells including a casing having a stop shoulder and having its side walls provided with oppositely disposed openings, a shoe engaging the walls of the casing and provided with sockets adapted to register with the openings in said wall, sectional bars extending transversely across the casing and having their outer ends extending through the openings in the casing for engagement with the sockets and their inner ends over-lapped and provided with elongated slots, a fastening device engaging the walls of the slots, and a flexible jacket interposed between the shoulder and the shoe, said jacket being movable to expanded position by engagement with the shoe.

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

WARREN BRIGGS DAUGHERTY.

Witnesses:

E. C. KNIFFIN,
ANDY C. SHUSTER.