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J. A. ZUBLIN

SECTIONAL BARREL FOR OIL WELL PUMPS

Filed Feb. 16, 1925

Fig. 1.

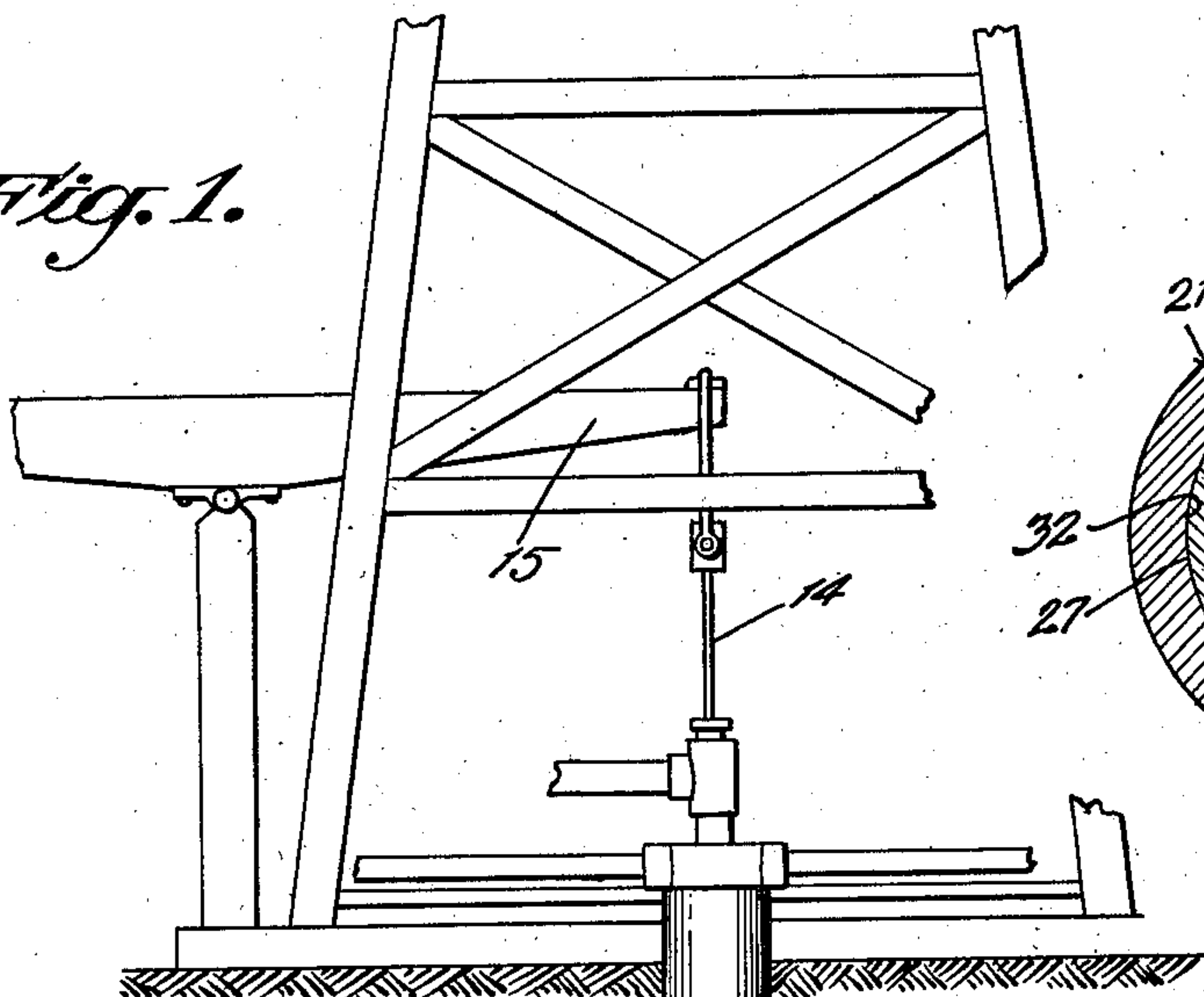


Fig. 4.

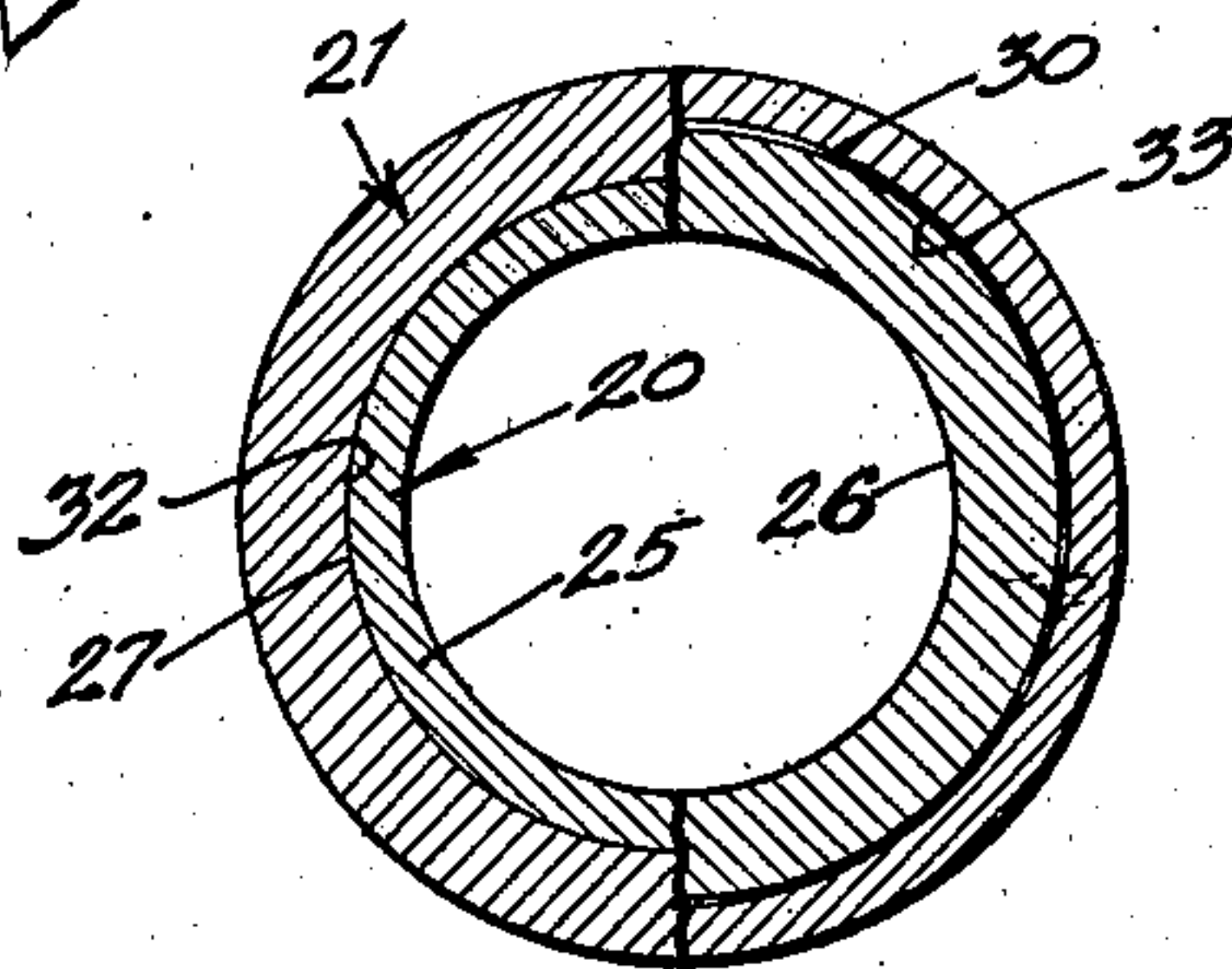


Fig. 2.

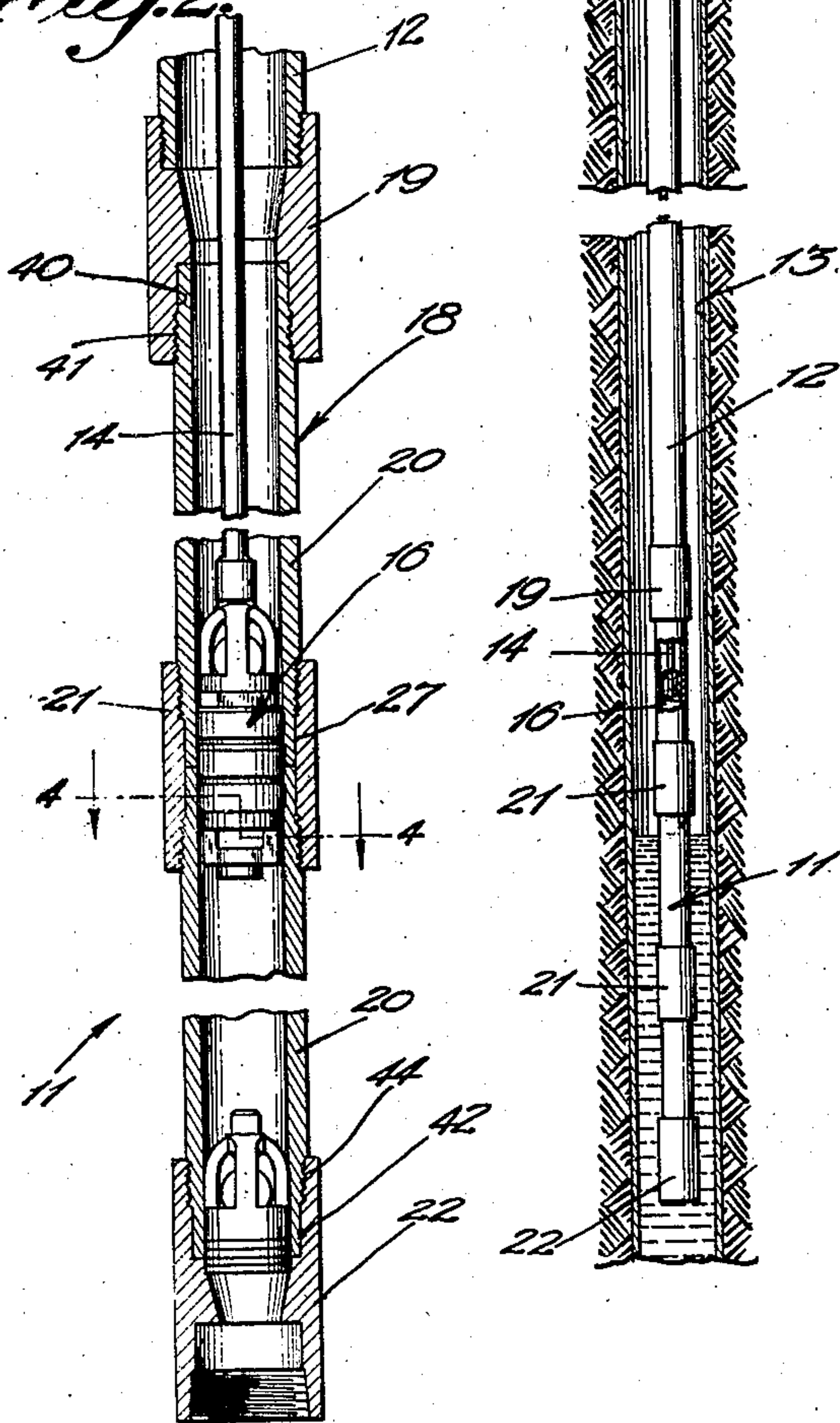
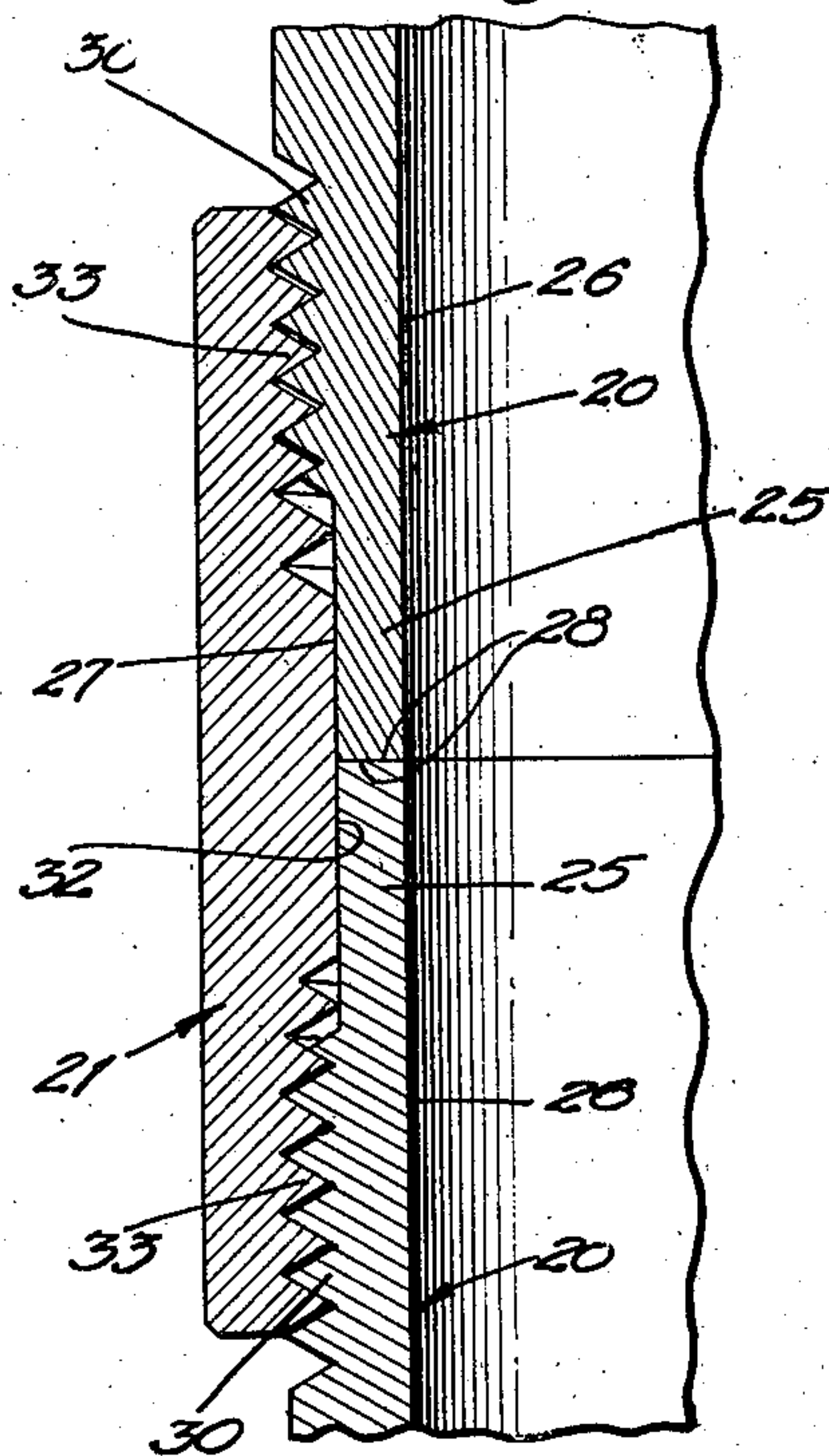


Fig. 3.



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SECTIONAL BARREL FOR OIL-WELL PUMPS.

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This invention relates to the oil producing industry, and it particularly concerns oil well pumps.

It is customary to pump oil from a well by means of a pump situated at the lower end thereof. The working barrel of such a pump is secured at the lower end of a pump tubing which extends upwardly through the well, and the pump plunger of such a pump is attached at the lower end of a string of sucker rods which extends upwardly through the pump tubing and is connected with a walking beam, which walking beam reciprocates the pump plunger by means of the sucker rods.

There are several types of working barrels for pumps of this character, such as one-piece barrels and liner barrels. A one-piece barrel consists of a tubular member of one length which is bored and reamed to proper size. A liner barrel consists of an outer jacket in which a plurality of short liners is assembled. These liners are finished to proper size and are secured in alignment inside the jacket by means of upper and lower collars which are secured to the ends of the jacket.

It is sometimes desirable to increase the length of the pumping stroke of the plunger in order to increase the production of the well. In order to make such an increase, it is necessary to have a working barrel which is proportionately longer. In the present types of barrel, the lengths are standard; and should such an increase in the pumping stroke be provided, the barrel must be replaced by a new barrel of proper length. In other words, in the present types of working barrel, it is impossible to vary the length thereof to accommodate the pumping stroke.

It is an object of my invention to provide a working barrel which may be lengthened as desired and which may be lengthened on the job. When the pumping stroke is increased the working barrel of my invention may be facily increased accordingly.

It is another object of my invention to provide a sectional working barrel. I provide my invention in the form of a number of tubular sections and collars for securing said sections together. When it is desired to lengthen the working barrel, an additional section is included in such barrel.

It is also an object of my invention to provide a sectional working barrel of this character which is so constructed that the sec-

tions may be accurately aligned in absolutely fluid-tight relationship. Each end of each of the sections is accurately turned down and ground so as to provide a sleeve portion, and adjacent to each of the sleeve portions is provided a male thread formation. Each of the collars is provided with a central cylindrical portion which is accurately ground to a size corresponding with the sleeve portions of the sections. Adjacent to the central cylindrical portion is provided female thread portions. The fit between the sleeve portions and the central portion is an accurate sliding fit, whereas the fit between the male and female thread portions is a loose fit. When two sections are secured together by a coupling, the sleeve portions thereof extend into the cylindrical portion of the collar, and the male thread portions are threaded into the female thread portions of the collar. The sections are threaded into the collar until the adjacent ends thereof, which are accurately ground, abut. This abutment between the ends and the close fit between the sleeve portions and the central cylindrical portion renders the barrel fluid-tight. By providing an accurate fit between the sleeve portions and the cylindrical portions an accurate alignment between the various sections is provided, and by making the male and female thread portions of a loose fitting nature any inaccuracy of the threads will not be effective in throwing the sections out of alignment.

Other objects and the especial advantages of my invention will appear in the following description.

Referring to the drawing which is for illustrative purposes only,

Fig. 1 is a diagrammatic view showing the utility of my invention.

Fig. 2 is an enlarged fragmentary sectional view showing a working barrel embodying the features of my invention.

Fig. 3 is an enlarged fragmentary sectional view clearly showing the collar construction and the end construction of the sections.

Fig. 4 is an enlarged cross sectional view taken substantially as indicated by the line 4-4 of Fig. 2.

In the drawings I show a pump 11 secured at the lower end of a pump tubing 12 which extends upwardly through a well 13. Extending through the pump tubing 12 is a sucker rod string 14, this sucker rod string

14 extending from a walking beam 15 and connecting to a pump plunger 16 (Fig 2), said walking beam 15 giving reciprocation to the plunger 16 in a manner to elevate oil to the surface of the ground. The pump 11 is provided with a sectional pumping barrel 18 having the features of my invention.

As shown in Figs. 1 and 2, the barrel 18 comprises an upper collar 19, a plurality of sections 20, a plurality of collars 21 and a lower collar 22. As clearly shown in Fig. 3, both ends of each section 20 are provided with a sleeve portion 25. This sleeve portion 25 has an outer face which is concentric with an inner face 26 of each of the sections 20, and which is accurately ground to a certain size. Each end 28 of each section 20 is also accurately finished off and ground. Adjacent to each of the sleeve portions 25 is formed a male thread portion 30. When adjacent sections are secured together by a collar 21, sleeve portions 25 of these adjacent sections 20 extend into a central cylindrical portion 32. This central cylindrical portion 32 is ground so as to be an accurate close fit with respect to the outer faces 27 of the sleeve portions 25. The male thread portions 30 engage female thread portions 33 formed in a collar 21 at each side of the central cylindrical portion 32. The male threads 30 and the female threads 33 are of a loose fitting relationship, as clearly shown in Fig. 3. The male thread portions 30 are screwed into the female thread portions 33 until ends 28 of the sections 20 contact each other, as shown in Fig. 3, these ends being tightly clamped together.

The features of providing accurate sliding fits between the sleeve portions 25 and the central cylindrical portion 32, and providing a loose fit between each of the thread portions 30 and 33 assure the accurate aligning of each of the sections 20. The accuracy of fit between the portions 25 and 32 assures aligning, and by providing a loose fit between the male and female thread formations no interference to this alignment can be present because of any inaccuracies in the threads. The forceful contact between the abutting ends 28 assures a non-leakage of the barrel between adjacent sections 20.

When machining a section 20 it is held by a suitable chuck at the center thereof and the inner face 26 is accurately finished to size. The thread formations 30 and the sleeve portions 25 are also turned and finished accurately to size without removing the section from the chuck. In this manner the inner face 26, the face 27 of the sleeve portion 25 and the thread formations 30 are all formed concentrically and absolutely true.

The upper collar 19 is provided with a cylindrical portion 40 and a female threaded

portion 41 to permit a securing of an upper of the sections 20 thereto, and the lower collar 22 is provided with a cylindrical portion 42 and a female portion 44 to permit a securing of a lower of the sections 20.

From the drawings and description it is evident that a sectional working barrel of my invention is of practical construction and provides a valuable feature not possessed by the present working barrels. It is obvious that by adding a desired number of sections to the barrel the length of the barrel may be increased as desired. Further, this addition may be made at the well due to the simple construction of the sections and collars, which assures an accurate aligning and non-leakage.

Although I have shown a single embodiment of my invention, it should be clearly understood that various modifications and various other constructions may be made without departing from the spirit and scope of my invention which should be construed entirely by the appended claims.

I claim as my invention:

1. In combination in an oil well pump, a working barrel comprising: a plurality of sections, said sections having sleeve portions at each end thereof and having male thread formations adjacent to said sleeve portions; and collars for holding adjacent sections together, each of said collars having a central cylindrical portion into which sleeve portions of adjacent sections extend and female thread formations into which male thread formations of adjacent sections thread, engagement between said male and female portions holding the ends of said adjacent sections in abutting relationship.

2. A combination as in claim 1 in which said sleeve portions and said cylindrical portions are a ground fit.

3. A combination as in claim 1 in which said male and female thread formations are a loose fit.

4. In combination in an oil well pump, a working barrel comprising: a plurality of sections, said sections having sleeve portions at each end thereof and having male thread formations adjacent to said sleeve portions; and collars for holding adjacent sections together, each of said collars having a central cylindrical portion into which sleeve portions of adjacent sections extend, and with which central portion said sleeve portions form a ground fit, and female thread formations into which said male thread formations of adjacent sections thread, said thread formations engaging with a loose fit, said engagement holding the ends of said adjacent sections in abutting relationship.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 9th day of February, 1925.

JOHN A. ZUBLIN.