

No. 865,595.

PATENTED SEPT. 10, 1907.

E. E. JOHNSON.
WELL SCREEN.

APPLICATION FILED OCT. 30, 1905.

Fig. 1.

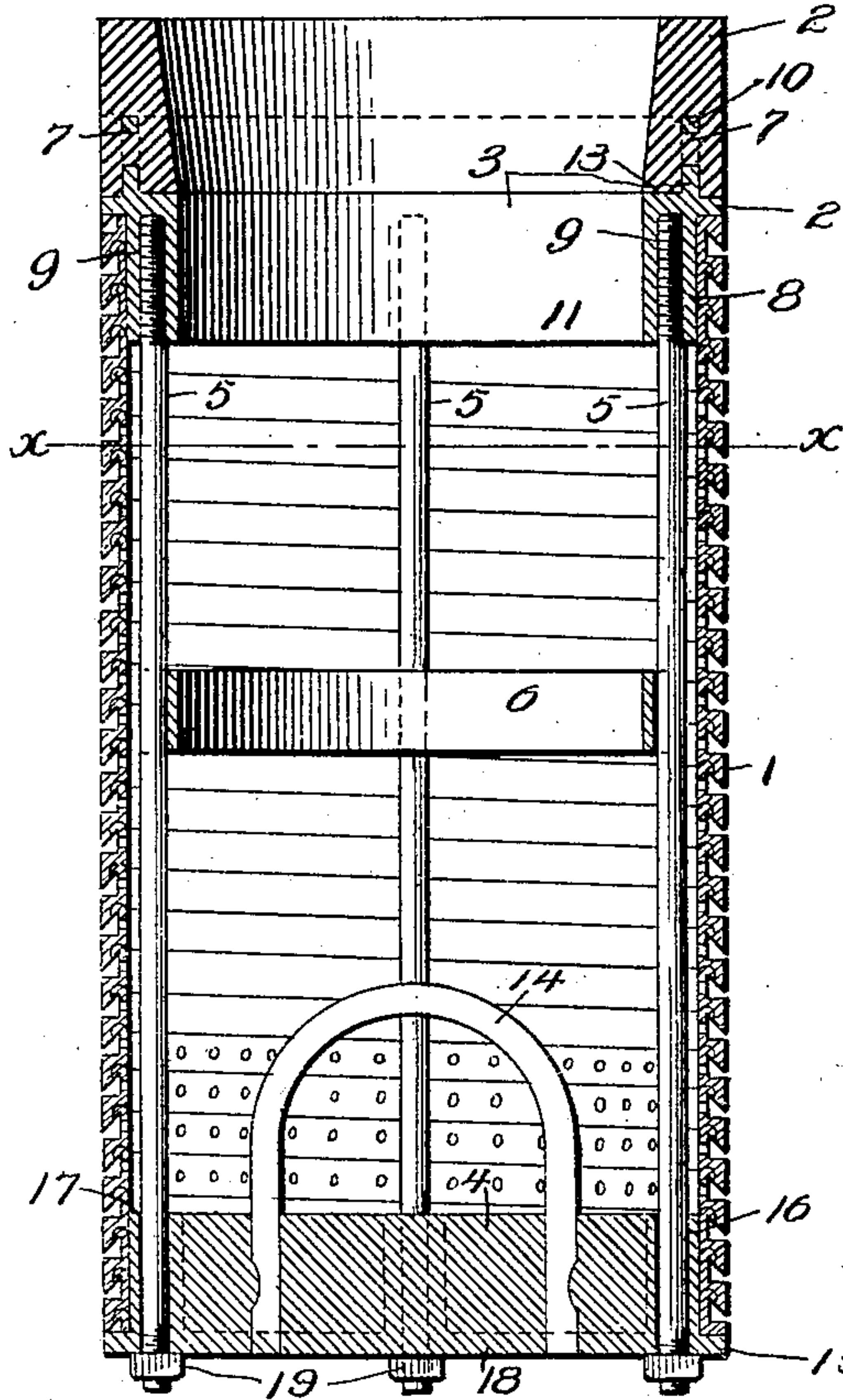


Fig. 5.

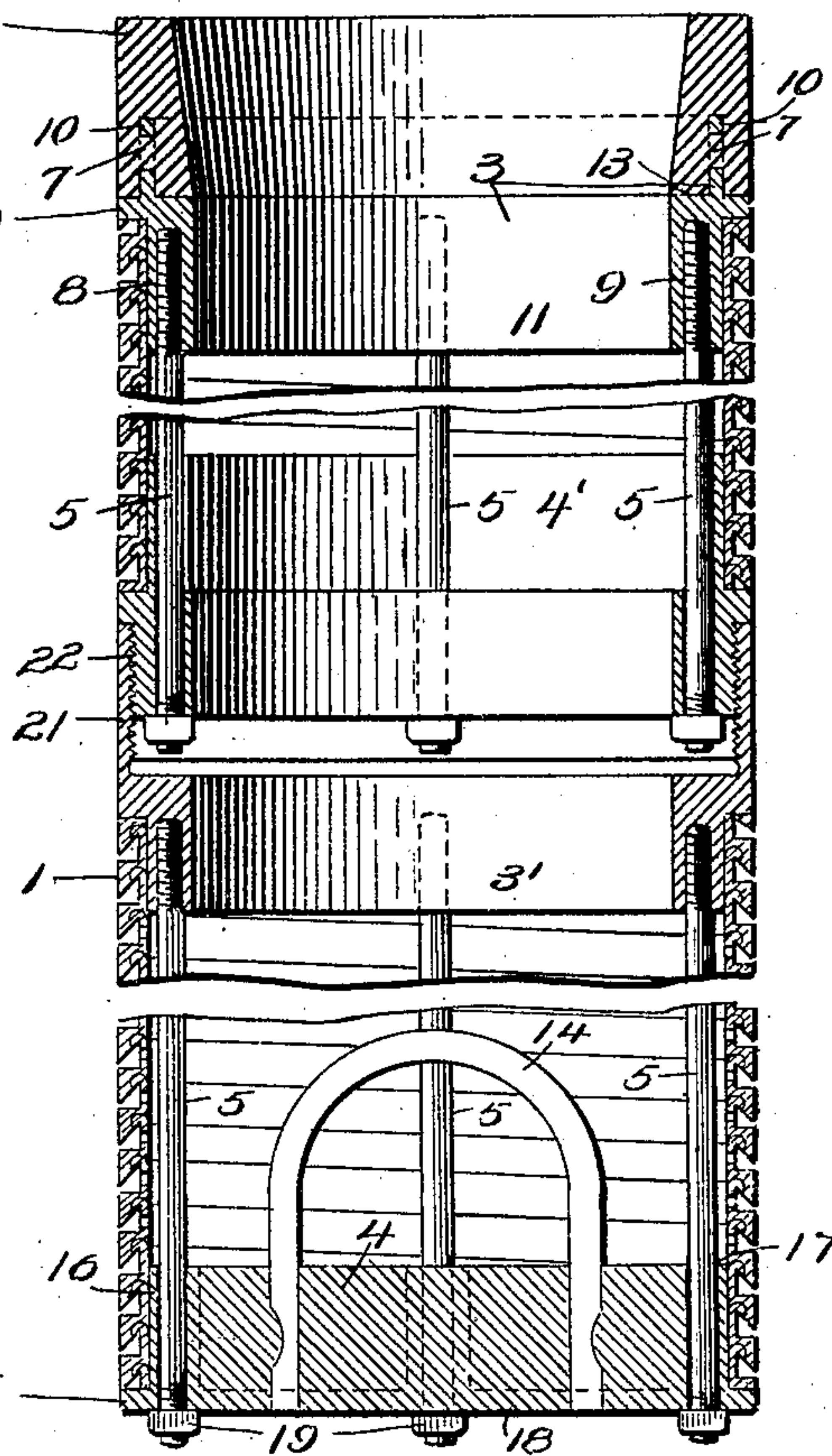


Fig. 2. Fig. 3.

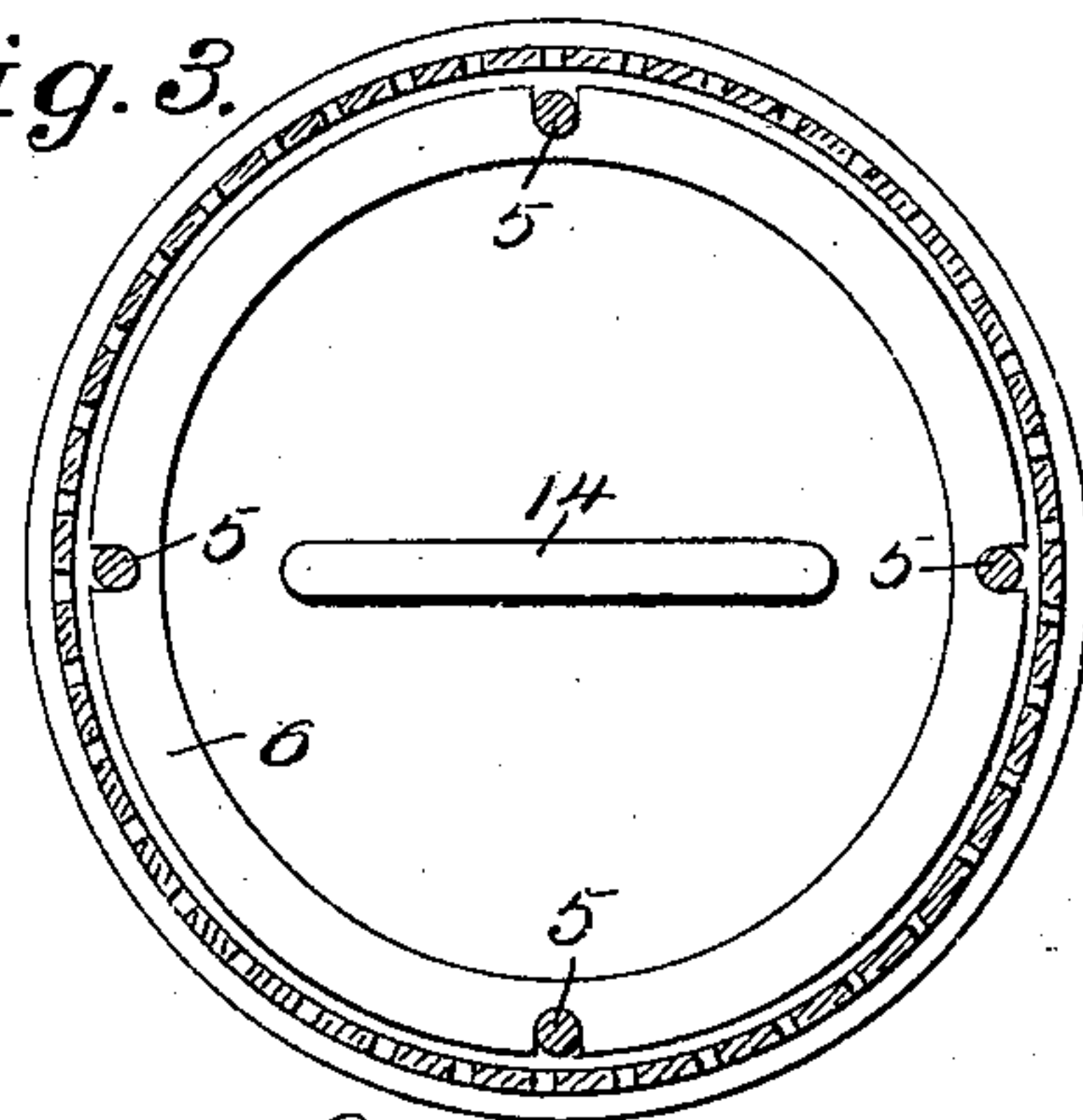
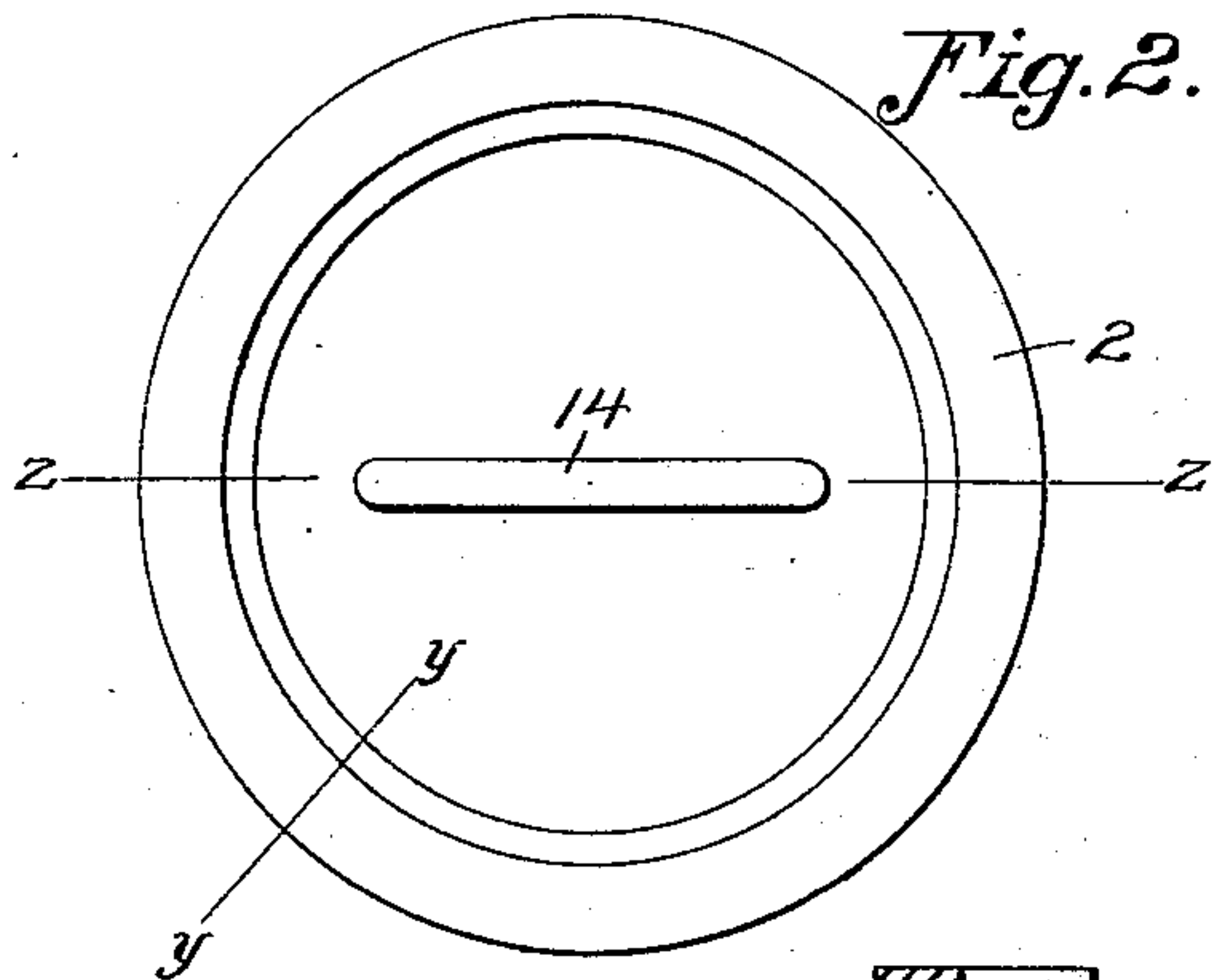


Fig. 4.

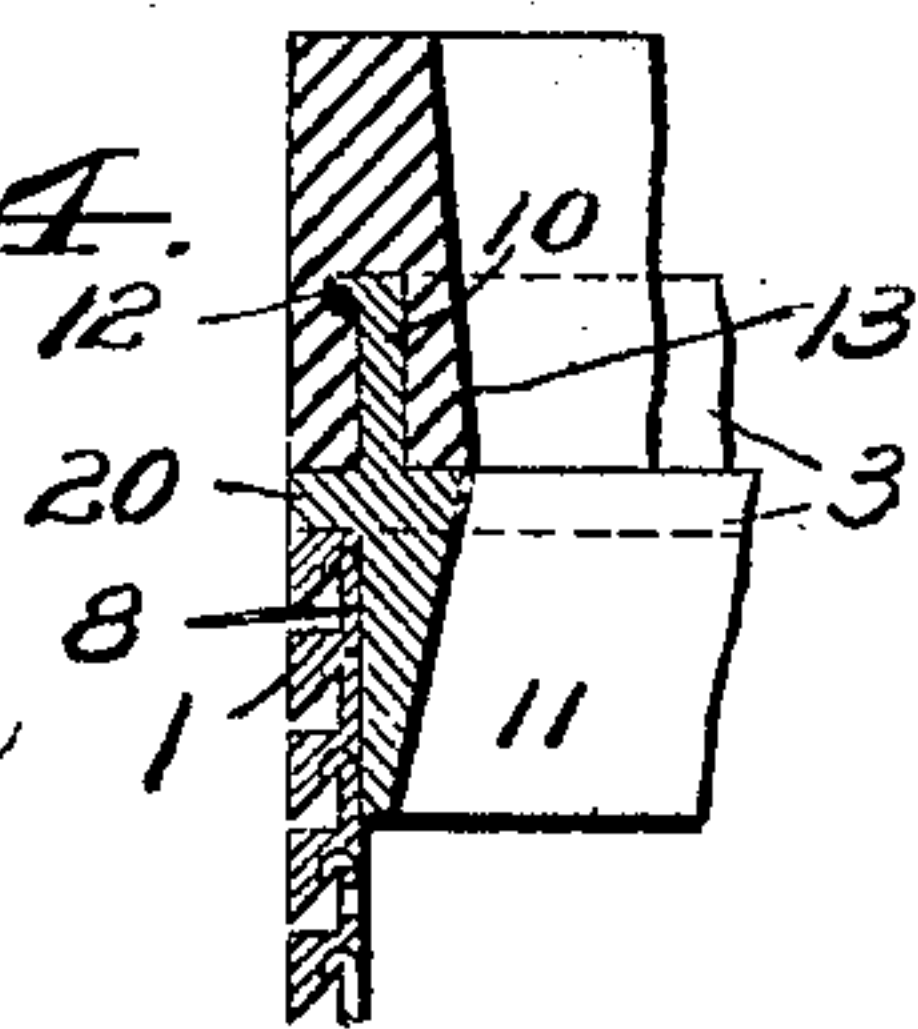
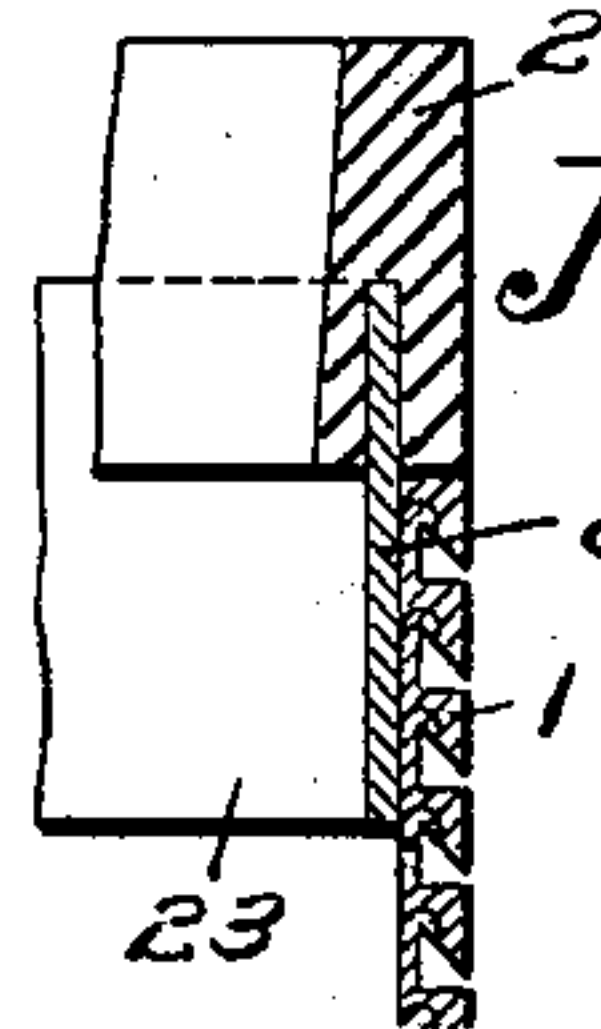


Fig. 6.



Witnesses

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WELL-SCREEN.

No. 865,595.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed October 30, 1905. Serial No. 284,990.

To all whom it may concern:

Be it known that I, EDWARD E. JOHNSON, a citizen of the United States, and a resident of White Bear Lake, county of Ramsey, State of Minnesota, have invented
5 certain new and useful Improvements in Well-Screens, of which the following is a specification.

The primary object of my invention is to provide an improved form of packer to make a sand tight joint in the well casing, and also to provide a tension system for
10 a screen, whereby it is made rigid to facilitate its handling and shipment and its insertion into the well, said rigidity providing also the necessary strength for removal of the screen from the well.

My improved packer and tension system can be used
15 with any suitable tubular screen and my invention consists of various features, combinations of features and details of construction hereinafter described and claimed.

In the accompanying drawings—Figure 1 is a front
20 view partly in section on ZZ of Fig. 2; Fig. 2 is a top plan of my screen; Fig. 3 is a sectional plan thereof on line XX of Fig. 1; Fig. 4 is a partial vertical section on YY of Fig. 2 taken in a plane through the axis of the screen and about 45 degrees from the section in Fig. 1.
25 Fig. 5 is a sectional elevation showing my invention applied to a screen constructed of two sections, the middle portion of each section and the spreader-ring being removed to shorten the view; Fig. 6 is a fragmentary sectional elevation showing a modified form of the packer.

30 Referring now to the drawings:—1 is the screen tube of any self-supporting form.

2 is the packer-ring of lead whose upper portion is expandible.

3 is the packer seat-ring whose office is to provide a
35 strong base for the expandible metal packer, and a means of attachment to the upper end of the screen tube, and also a connection for the tension rods 5.

4 is the lower ring or bail-nipple which besides furnishing the closure for the lower end of the screen-tube
40 and means for lowering and raising the screen in the usual manner, furnishes the abutment for the tension rods 5.

5 are tension rods inextensibly fastened to seat-ring 3 and abutting by means of a threaded nut or other
45 means of adjustment against ring 4.

6 is a spreader ring to keep the rods 5 in proper alignment.

The packer seat-ring 3 is in general of annular form and made preferably of cast brass or cast iron or of
50 pressed or rolled steel. It is preferably made with its upper portion 10 having a comparatively thin section. It may be provided with holes 7 as shown in Fig. 1 into which the lead may run so as to lock it more securely, or, as shown in Fig. 4, lugs 12 may be used for the same

purpose. The lower portion 11 is made of a thicker section adapted to slip inside the screen tube 1, and be fastened rigidly thereto, preferably by soldering of the contiguous surfaces 8. Part 11 is provided with receptacles 9 for the retention of the ends of the rods 5. Preferably these are threaded holes. The inner face of portion 11 may be beveled at points between the holes 9 as shown in Fig. 4, so as to present a surface which will not catch the tools used in setting or cleaning the screen. The ring 3 is further provided with an outwardly projecting flange 20 whose office is to form a shoulder for the base of the lead ring 2, and an abutment against the end of tube 1. The inwardly facing shoulder 13 also serves to support the lead ring while it is being expanded. The inner portion of part 11 is so fashioned that it can be gripped by a proper tool, a taper tap for example, should the screen need to be removed.

In Fig. 6 I show a modification of seat ring 3 such as I use on the smaller sizes of screens. The seat ring 23 in this form is made of a collar of metal preferably brass or galvanized iron. In practice the seat ring 3 or 23 is
75 tinned to prepare it for attachment to the lead ring 2.

The seat-ring is preferably made a portion of the mold into which the molten lead is poured; the process giving a very firm adhesion of the lead ring 2 to the seat-ring 3 or 23. It is possible also by this method to
80 keep the finished packers consisting of rings 2 and 3 or rings 2 and 23 in stock ready for attachment to screen tubes.

The bail nipple 4 is provided with a body portion 16 having an outwardly projecting flange 15 which serves
85 as an abutment on the end of tube 1. The nipple is provided with holes 17 for the passage of the tension rods 5, and with a bail 14 for setting and removing the screen and with a web or bottom 18 which closes the tube.

In practice I attach the rods 5 to seat ring 3 and slip them into the tube. I then solder the ring 3 to the tube 1, and then tighten up the threaded nuts 19. If the tube is a long one I insert a spreader ring or rings 6 between parts 3 and 4 for the purpose of supporting
95 the rods 5. The result is to place the tube 1 in compression and the rods 5 in tension thus stiffening the whole against forces tending to bend the tube sidewise in handling, and adding the strength of the rods to that of the tube to resist an end pull as when the strainer is
100 being removed.

It is obvious that the bail 14 and bottom 18 might be left out and the tension system be left intact. If, for example see Fig. 5, the top attachment 3' and bottom attachment 4' were furnished with co-acting threaded
105 portions 21 and 22, they could be attached to the opposite ends of a screen tube and with the tension rods 5 perform the same office in stiffening the tube as though

used as shown in Fig. 1. Or rings 3 and 4' could be used on the opposite ends of a screen tube or rings 3' and 4 similarly, depending on the number of sections it be advisable to divide the screen into for purposes of handling.

It will be understood from the foregoing description that the tension rods and spreaders have nothing to do with supporting the screen tube against pressure acting radially from without.

10 I am aware that screens having longitudinal rods and transverse rings all forming a radial support to the screen tube have been made, and I disclaim any such office for my construction. The screen tube I prefer is of the kind that is wholly self-supporting if the tension system is omitted, such for instance as is shown and described in my co-pending application serially numbered 244,266, and which is no part of my present invention.

I claim as my invention:—

- 20 1. A well screen comprising a screen tube, end rings for the same, longitudinal tension members connecting the end rings, and means for putting these tension members under tension.
- 25 2. A well screen comprising a screen tube, end rings for the same, longitudinal tension members connecting the end rings, means for putting these tension members under tension, and a spreader ring to keep the tension members in alinement.
- 30 3. A well screen tube embodying a seat ring and an annular packer supported on the seat ring and having an expansible portion.

4. In combination with a well screen tube, a seat ring attached thereto, and an expansible packer ring secured to and supported on the seat ring.

5. A well screen tube, an expansible packer ring, a seat ring carrying said packer ring, and being soldered to the screen tube. 35

6. In combination, a screen tube, a seat ring attached to the upper end thereof, and an expansible metal packer ring cast on the seat ring. 40

7. In combination, a screen tube, a seat ring attached thereto and having an annular portion fitting within the same and another annular portion outwardly projecting and abutting against the end of the screen tube, and a packer ring attached to said seat ring and supported on said outwardly extending annular portion. 45

8. In combination, a screen tube, a ring engaging each end thereof, and tension rods connecting said rings.

9. In combination, a screen tube, an annular ring at each end thereof, each ring having an outwardly extending annular portion engaging the adjacent end of the tube and another annular portion extending into the tube, tension rods connecting said rings and means for tightening them, and a packer ring on the upper ring. 50

10. In combination, a screen tube, a ring at each end thereof, tension rods connecting the rings, and a bail attached to the lower ring. 55

11. In combination, a screen tube, a ring for each end thereof, the lower ring having a bail cast into it, and means independent of the screen tube for connecting said rings. 60

In witness whereof, I have hereunto set my hand this 27th day of Oct., 1905.

EDWARD E. JOHNSON.

Witnesses:

E. B. SOMMER,
JOHN ORR.