

(No Model.)

2 Sheets—Sheet 1.

L. STEWART.
OIL WELL PACKER.

No. 248,229.

Patented Oct. 11, 1881.

Fig. 1.

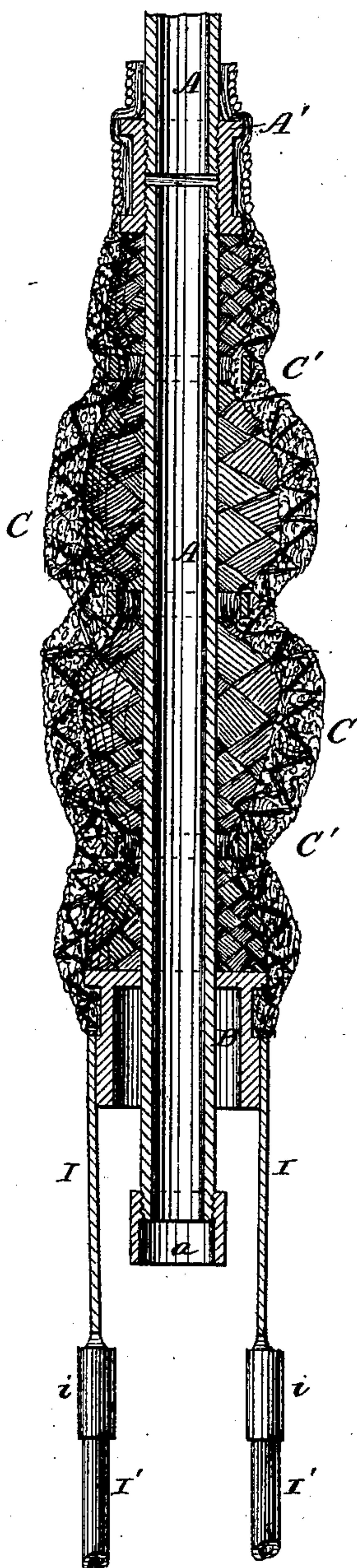
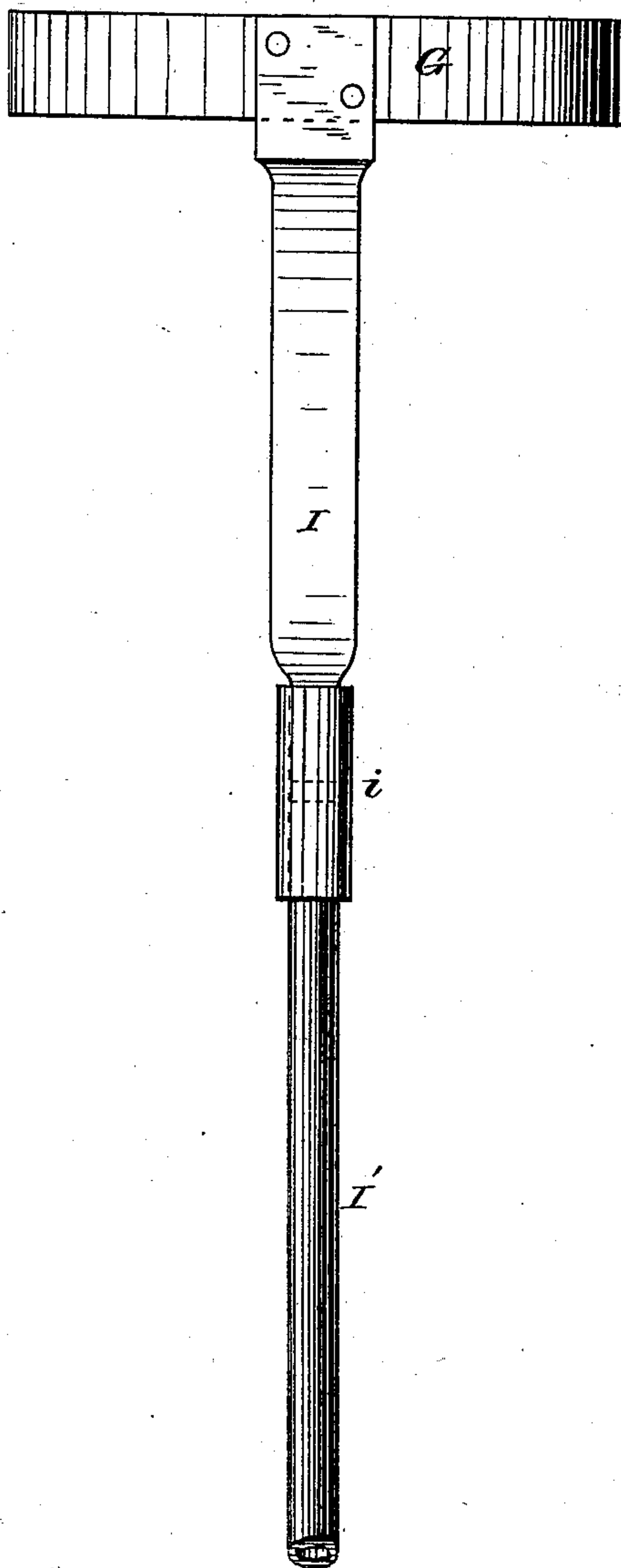


Fig. 3.



Witnesses:

H. W. Low
J. S. Barker

Inventor:

Lyman Stewart
by S. W. Bliss
atty

(No Model.)

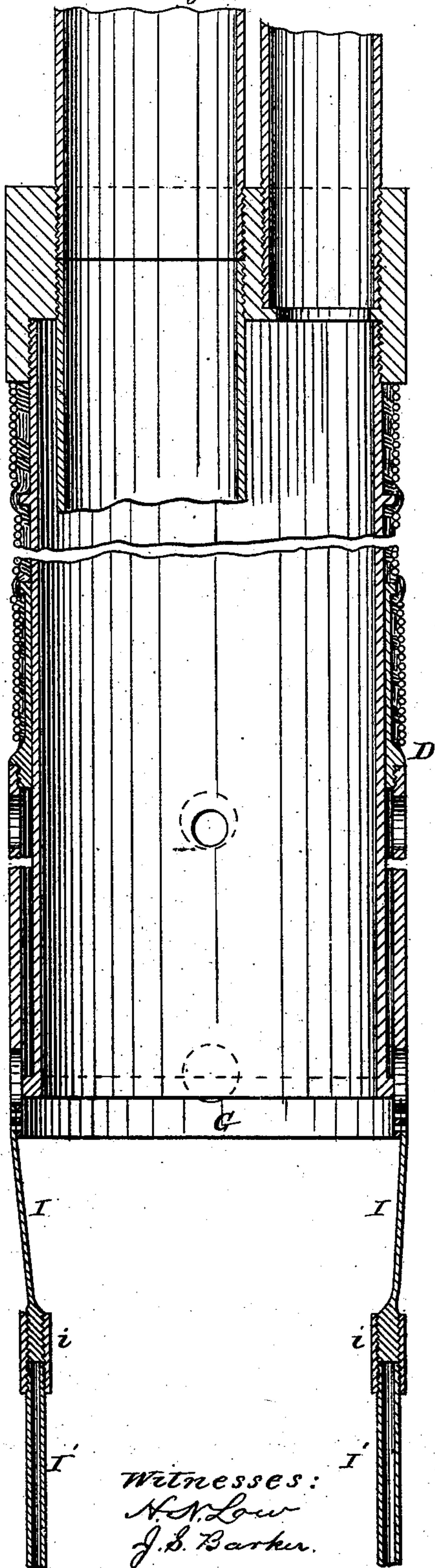
2 Sheets—Sheet 2.

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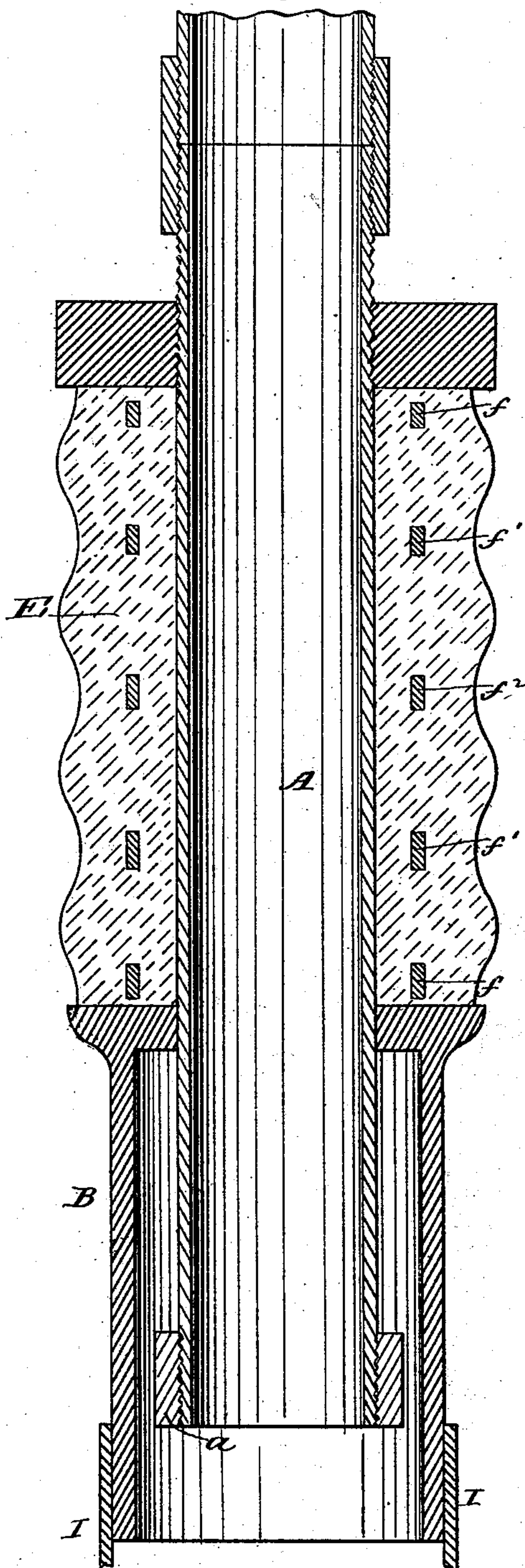
Patented Oct. 11, 1881.

Fig. 2.



Witnesses:
H. V. Low
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Fig. 4.



Inventor:

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G. Doubleday & Bliss atty

UNITED STATES PATENT OFFICE.

LYMAN STEWART, OF TITUSVILLE, PENNSYLVANIA.

OIL-WELL PACKER.

SPECIFICATION forming part of Letters Patent No. 248,229, dated October 11, 1881.

Application filed November 24, 1880. (No model.)

To all whom it may concern:

Be it known that I, LYMAN STEWART, a citizen of the United States, residing at Titusville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Oil-Well Packers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a vertical section of a packer having my invention applied thereto. Fig. 2 is a vertical section of another packer, showing one part of the invention. Fig. 3 is a detached part, enlarged, showing a modification of this latter part of the invention. Fig. 4 represents a packer having a rubber annulus with the first part of my invention applied thereto.

The first part of my improvement is designed more particularly to be used in the construction of packer patented to me December 25, 1875, No. 171,589, in which a fibrous packing is applied externally to a tube in connection with a telescopic joint, or its equivalent, whereby, when the upper section of tubing is forced downward relative to the packer support or anchor, the packing material is compressed and forced tightly against both the tubing and the wall of the well; but this part of my invention may be used advantageously in packers in which material other than fibrous is employed, the essential features of this part of the invention consisting in combining with the eduction-tube of an Artesian well a packing material surrounding said tube, and having its outer surface corrugated or ribbed, with a mechanism for expanding the packing material laterally and pressing it against the wall of the well by compressing it in a longitudinal direction when the weight of the superincumbent tubing is allowed to act upon said packing.

The second part of my invention relates to the employment of legs to support the packer against the downward thrust of the superincumbent tubing, whereby certain advantages are secured, as will be hereinafter set forth.

Referring to Fig. 1, A is the eduction-tube, through which oil is discharged.

B represents the upper portion of the anchor or packer-support, and may consist of a ring, a flange, or a section of casing, so constructed as to admit of the legs II being attached thereto by riveting, as shown in Fig. 3, or by any other usual or approved means. By preference I construct these legs of flat bars of iron rounded and threaded at their lower ends to receive threaded sleeves or couplings, to which are connected extensions I' I', which may be continued by the addition of successive lengths to the bottom of the well. By preference I use for these extensions small gas-pipes; but round rods of iron may be employed. a is a ring attached to the lower end of eduction-tube A, and adapted to engage with the part B and support the same when the tubing is put into and drawn from the well.

C represents a fibrous packing material attached at its lower end to the part B, and at its upper end to a flange or ribbed coupling, A', which may also be employed to connect sections of the tubing.

C' C' C' are rings applied to the fibrous packing, preferably by having the packing braided around them while said packing is being applied to the tube A; but the rings may be applied to the packing after said packing has been braided upon the tube, if so desired.

It will be readily understood from an examination of Fig. 1 that as the packing is compressed by the weight of the superincumbent tubing, the anchor being supported from downward movement, the rings will restrict the outward expansion of the packing at the points where they are placed and adjacent thereto. Thus they perform two functions: First, they counteract the tendency of the packing to telescope, which would exist were it not for their presence; and, secondly, they compel the outer surface of the packing to assume a corrugated form during the operation of compressing it against the wall of the well. Constructing the packer with its outer surface thus corrugated facilitates an effectual packing of the well, because it insures a practically uniform density of the packing throughout its entire length, and by causing its close contact with the wall of the well at several points, because this form

compels it to bulge between the rings as the packing is acted upon by the weight of the tubing. In Fig. 4 I have shown this part of my invention applied to a rubber annulus, E, in which five rings, F F' F², are seated during the process of manufacture, such rings being placed at a greater or less distance from the outer face of the rubber, as may be required. In Fig. 2 I have shown the second part of my invention applied to the packer patented to me March 6, 1877, No. 187,990, in which the anchor-ring G is about five inches outside diameter, and has applied thereto wide flat legs I I.

An advantage grows out of the use of these legs instead of a large tubing or casing, which is usually employed, from the fact that they are much less liable to be wedged or held firmly in the lower part of the well by the pieces of rock which are detached therefrom when the well is torpedoed, while by arranging the legs upon substantially opposite sides of the ring or casing B, I provide for the reception of the eduction-tube between said legs.

I do not wish to be limited to the employment of any particular construction of rings in connection with the packing material to restrict its outward expansion, as many modifications of the form which I have shown might be made without departing from the spirit of my invention.

I am aware of the patent to Parker, dated October 2, 1866, and that said patent shows a packing having the grooves extending around its outer surface, whereby the said packing is adapted to be pressed against the wall of the well at a number of points intermediate between its upper and lower ends; hence I do not claim anything therein shown or described. But the groove in the Parker packing is spiral in form, and therefore, instead of serving to more effectually pack an oil-well by reason of its impingement against the surface at several points, as above mentioned, the said groove would operate to conduct water from the upper to the lower part of the well; whereas in my construction the grooves are formed in substantially horizontal planes, and without there being any opening or passage-way for water between one groove and the other.

I am also aware of the patent to Moulton, March 14, 1865, and hence do not claim anything therein; but the Moulton patent shows no means for pressing the upper edge of his lower cup against the wall of the well, except in case water passes the upper cup. Neither does he show any mechanism within the control of the operator for expanding the rubber cups and forcing them against the wall of the well.

I am also aware of the Patent No. 49,599, to Sicouret, and do not claim anything shown therein; but my construction possesses marked advantages over Sicouret's. For instance, an examination of Fig. 2 in his patent shows that he intended that the thin plates of his packer

should be pressed close together when the device is operated to pack a well, and hence, as the edges of his plates are flat, they constitute a cylindrical annulus of substantially uniform diameter from top to bottom, and which is not corrugated on its outer face when in use. Again, if a well could be packed by the Sicouret device without pressing the plates close together, his combination of parts is such as to necessitate the use of washers to make tight joints around the rods which extend from the lower flange to the top of the well; otherwise water would leak down between the plates and the rods, from the fact that the holes through the plates must be oblong to permit the plates to assume their various positions, while the combination which I employ—that is, of an annulus having its outer ends corrugated with two sections of tubing connected by a telescopic joint—permit me to use an annulus which is substantially homogeneous and solid in texture from end to end, because no rods pass through it. Again, the rods in Sicouret's packing compel all of the plates to expand uniformly, whereas in my construction the central ribs which are formed by the corrugations may be, and in practice are, first expanded against the wall of the well by the downward movement of the upper section of tubing, the continued descent of the tube forcing the upper part of the packing against the wall of the well, thus preventing the upper part from being first expanded against the wall of the well, and then forced downward, thus avoiding scraping the packing material against the rock. Nor do I claim in this case the combination, with the packing material, of rings adapted to restrict its outward expansion, as I prefer to claim such invention in another application which I am about to file as a division of this case.

What I claim is—

1. In an Artesian-well packer, the combination of the following elements, namely: an eduction-tube adapted to rise and fall within the well, an anchor or packer-support below the upper sliding section of tubing, and a yielding packing material surrounding the eduction-tube, and provided upon its outer surface with corrugations which extend around the packing in substantially horizontal planes when the material is elongated for introduction into the well, and which is adapted to be pressed against the wall of the well by the weight of the sliding tube-section, substantially as set forth.

2. In an Artesian-well packer, a packer-support having two or more legs arranged on opposite sides of a central opening, whereby there is an unobstructed space between the legs adapted to receive the eduction-tube, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LYMAN STEWART.

Witnesses:

N. R. BATES,
JAMES A. PINCOTT.