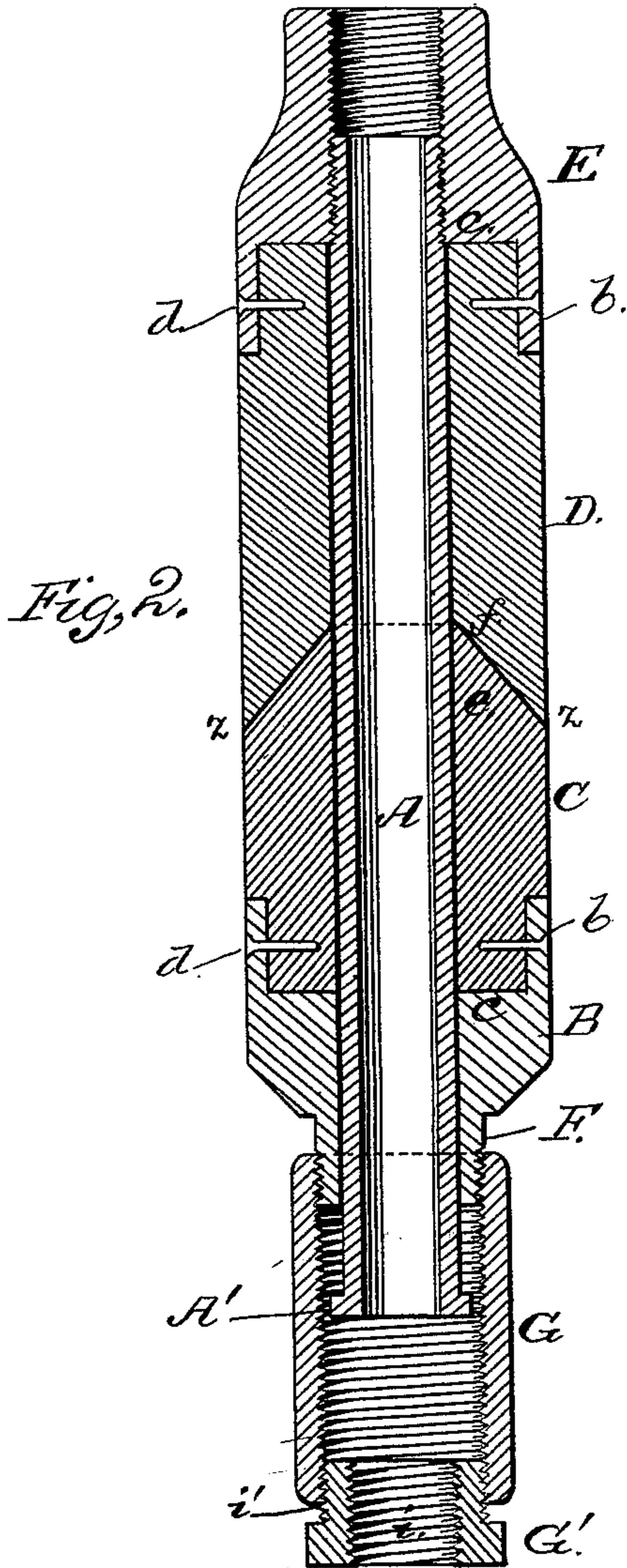
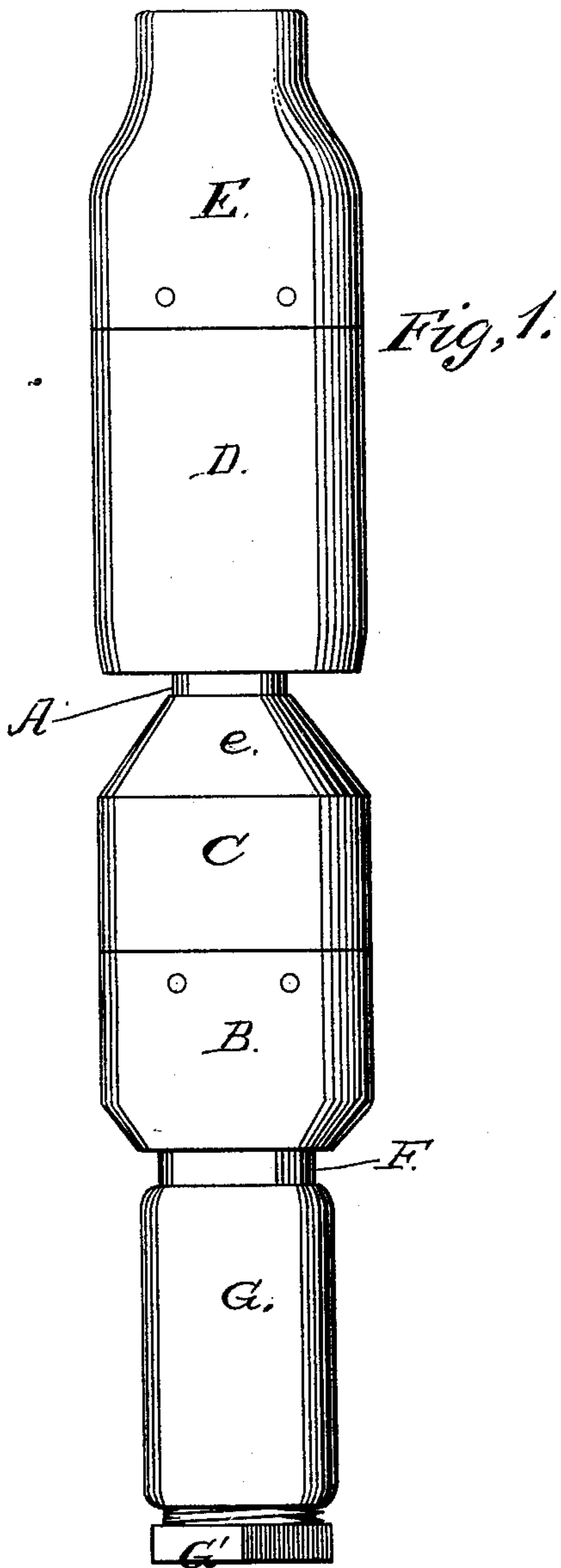


J. H. WILLIAMS.
Water Packer for Oil Wells.

No. 234,102.

Patented Nov. 2. 1880.



WITNESSES

Villette Anderson,
Frank J. Masi.

INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN H. WILLIAMS, OF CUSTER CITY, PENNSYLVANIA.

WATER-PACKER FOR OIL-WELLS.

SPECIFICATION forming part of Letters Patent No. 234,102, dated November 2, 1880.

Application filed January 17, 1880.

To all whom it may concern:

Be it known that I, JOHN H. WILLIAMS, of Custer City, in the county of McKean and State of Pennsylvania, have invented a new and valuable Improvement in Water-Packers for Oil-Wells; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my improved packing, showing the position of the rubber rings when the well-tube is raised out of the well, and Fig. 2 is a longitudinal section of the same.

This invention has relation to the class of oil-well packers which are designed to be expanded by the weight of the pipe above against the wall of the bore, and which contract as the pipe is raised, receding from the wall and allowing the pipe to be easily and expeditiously elevated.

The invention consists in the construction and novel arrangement, in combination with a pipe-section having a check-flange or collar at its lower end, of an upper cap secured to said pipe-section, and carrying an annular rubber packing-section having a concave lower end, and a sliding cap or head on the pipe, near its lower end, supporting a convex-end rubber packing-section against the concave end of the upper packing-section, and connected to a chamber-coupling or sleeve below, in which the lower or flanged end of the pipe plays, all as hereinafter shown and described.

In the accompanying drawings, the letter A designates the central tube or pipe-section, having on its lower end a collar or flange, A', said pipe-section extending up through the lower sliding cap, B, the rubber packing-rings C D, and secured at its upper end to the internally-threaded cap E. Above the pipe-section A the well-tubing is designed to be screwed into this cap, and continues up to the surface of the ground or to the pump.

The caps B and E are provided, upon their upper and lower surfaces, respectively, with annular marginal flanges b, whereby seats c

are formed, in which are secured the annular rubber packing-sections C and D.

The lower packing-section, C, has a convex conical upper end, e, and the upper ring or packing-section, D, is made with a concave conical lower end, f, which is designed to correspond with the end e of the upper section, fitting over the same and engaging therewith.

The lower or sliding cap, B, is provided, at its lower end, with a threaded extension or neck, F, upon which is screwed a chamber-coupling or sleeve, G, for connection with the tubular sections below, a second coupling, G', being usually employed, in addition, to facilitate the connection.

The operation of the packer is as follows: Being lowered into the well until the pressure of the tubing above causes the pipe-section A to move downward through the lower cap, B, bringing the ends e and f of the rubber packing-sections into forcible engagement, the upper packing-section, D, expands against the wall of the well-bore, fitting it neatly with its thin or acute edge z, and as the pressure is continued the lower packing-section also expands against the well-wall, packing it closer, and at the same time making a gas-tight joint in the cap around the sliding pipe-section. This enables the well to be pumped without withdrawing the packer from the well, as by raising it a little the gas will be allowed to escape without permitting the superincumbent column of water to descend into the well or into the tube, the lower packing-section making a tight joint in the cap around the tube. This rubber cone expands under pressure and forces out the upper section, and when the pressure is relieved the lower cone contracts and releases the upper section of the packing, allowing it to be readily withdrawn.

It will be observed that by my duplicate packing-rings the upper one, D, by its acute portion, acts immediately, while the after-pressure acts upon both of the rings and gives a great area of bearing-surface against the sides of the well, and at the same time they operate efficiently to relieve the pressure at once upon the rising of the rod.

I am aware that it is not new to employ an elastic packing-section and a metallic cone to

force a rubber ring against the sides of the well, the said ring being rigidly connected to the pipe, as such construction is shown in reissued Patent No. 8,786, of July 1, 1879; but the rigidity of the walls of the well and the cone not only make the packing of doubtful success and efficiency, but the packing necessarily lasts but a short time. The bearing-surface is but small, and the packing-ring is consequently unreliable.

I am also aware that a single elastic annulus has been used in connection with an upper holding head or cap secured to a sliding pipe-section having a lower movable head, as shown in Patent No. 218,282, of August 5, 1879; but in such construction the bearing-surface is minimum, and consequently the wear is great. Besides, the elastic portion between the metal ring and the walls of the well would soon be destroyed by the pressure of the sharp edge of the ring.

In this art it is a desideratum to furnish a large bearing-surface, and to have a quick action upon the first portion of the descent and a firm action thereafter; all of which I accom-

plish by my upper packing-ring, with a lower concave end, and my lower packing-ring, with a corresponding convex upper surface, each independent of the other, and each adapted to secure a gas-tight joint in the cap and around the lower end of the sliding pipe-section.

What I claim, and desire to secure by Letters Patent, is—

The water-packer for oil-wells, consisting of the upper rubber packing-section, D, having a concave end, *f*, and acute angular edge *z*, and the lower rubber expanding and contracting packing-section, C, having a convex end, *e*, fitting said concave end, in combination with the sliding pipe A, extending through said packing-sections, the screw-cap E, the sliding cap F on said pipe, and the screw chamber-coupling G, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOHN HENRY WILLIAMS.

Witnesses:

WILLIAM M. RANKIN,
DANIEL B. ATWOOD.