

W. S. Kelly, Pump Piston,

No. 61,209.

Patented Jan. 15, 1867.

Fig. 1.

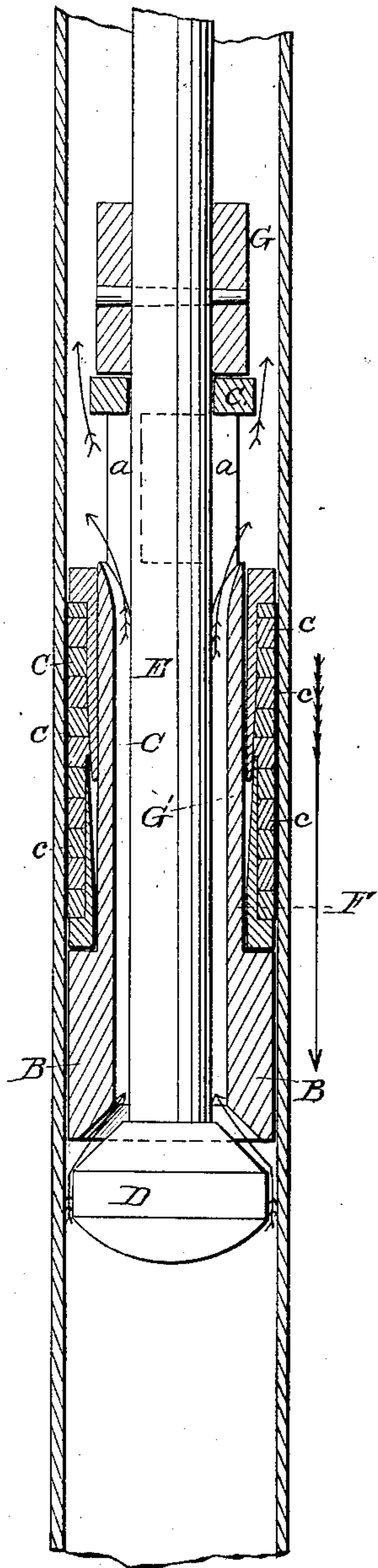


Fig. 2.

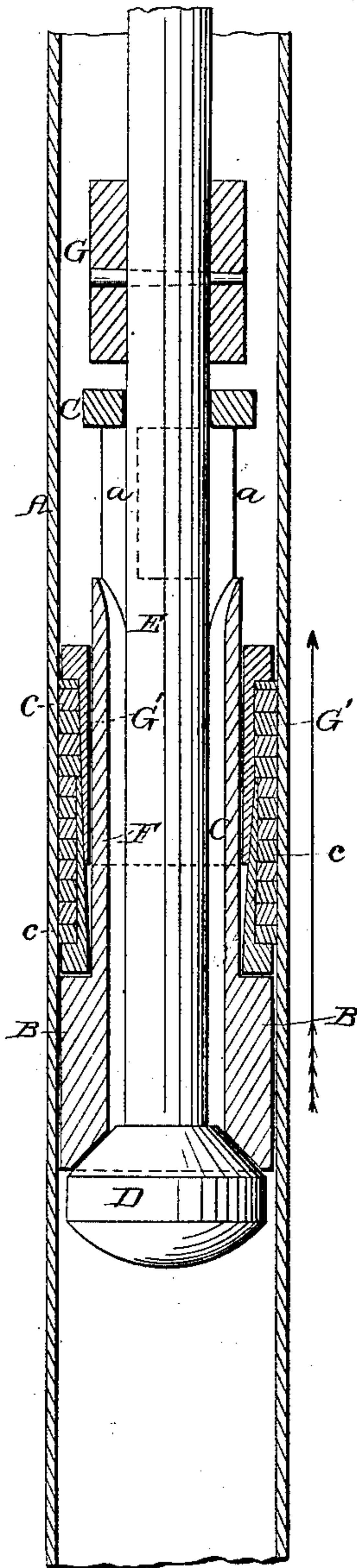


Fig. 3.

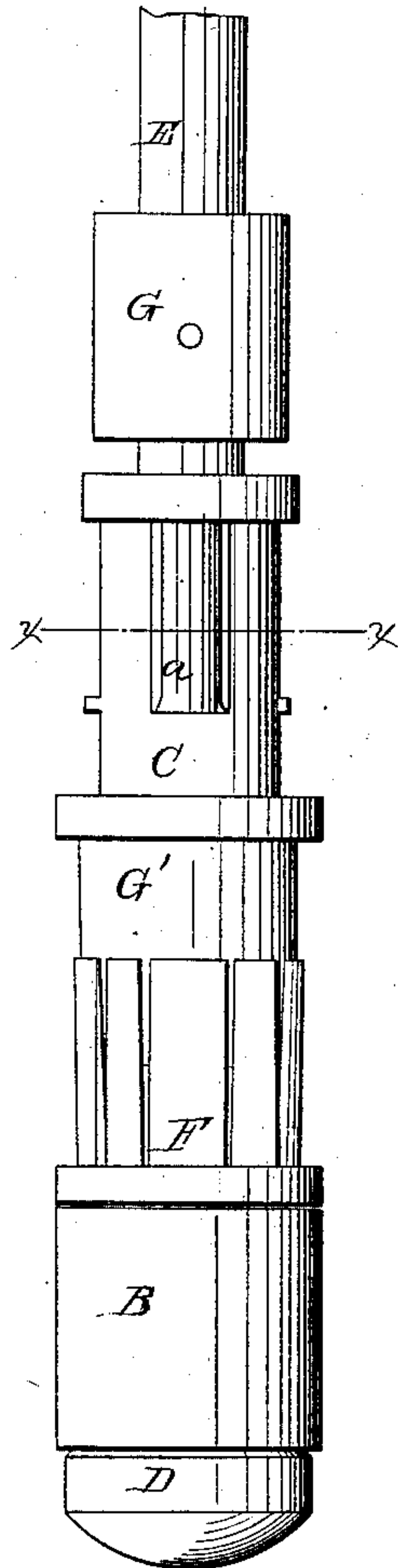
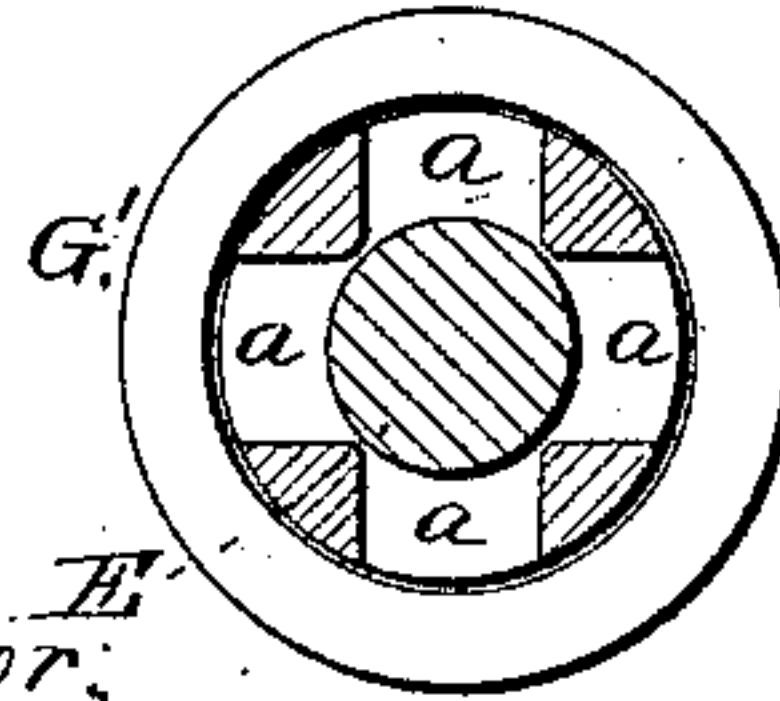


Fig. 4.



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United States Patent Office.

WILLIAM S. KELLY, OF SCHENECTADY, NEW YORK.

Letters Patent No. 61,209, dated January 15, 1867.

IMPROVEMENT IN PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM S. KELLY, of Schenectady, in the county of Schenectady, and State of New York, have invented a new and improved Pump Piston; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical central section through the improved piston in the act of descending in the well-tube.

Figure 2 is a view of the same parts when the piston is in the act of ascending.

Figure 3 is an external view of fig. 2.

Figure 4 is a horizontal section taken at the point indicated by red line *x x* in fig. 3.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improvement on the construction of pump pistons for all varieties of pumps, and more particularly for such as are used in oil-wells.

The main object of my invention is to have the piston-valve applied to a piston-rod, which not only moves the piston in the well-tube, but which also has an independent movement of the piston sufficient to allow of the opening and closing of the aperture through the latter; said piston being so constructed that the water or other liquid shall escape from it at a point or points below its upper end, as will be hereinafter described. Another object of my invention is to employ an expansible packing in conjunction with a piston, the valve of which is applied to and opened and closed by the action of the piston-rod, said packing being so constructed and applied to the piston, or to an upper perforated extension thereof, in such manner as to be expanded by the pressure of the column of liquid above it, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings I have represented my improved piston applied within a metallic tube, A, such as is used for Artesian or oil-wells. The piston consists of a hollow cylindrical head, B, which is nearly equal in its diameter to the interior diameter of the tube A. The upper end of this head terminates in a cylindrical extension, C, through the upper portion of which a number of openings, *a a*, are made for the upward escape of liquid as the piston descends into the well. This extension, C, is hollow, and its external diameter is somewhat less than the diameter of its head, B, thus leaving an annular space between it and the well-tube for the free lateral escape of the liquid through openings *a a*. Said extension is also reduced in diameter for the purpose of receiving around it a packing, as will be hereinafter described. The upper end of the extension C is closed, except the opening which is made through its centre for the reception of the piston-rod. The lower end of the enlarged head B is reamed out so as to form a valve-seat for a conical valve, D, which is secured upon the lower end of the valve-rod E, as shown in figs. 1 and 2. The valve-rod extends upward through the upper end of the perforated extension C, and receives upon it a collar, G, which is secured in place so as to serve as a means of depressing the piston when rod E is depressed. In conjunction with a piston which I have above described, I employ an expansible packing, which may be made of a number of split rings of leather, or other suitable substance, applied around the extension C just above the enlarged head B. For the purpose of expanding the rings *c c*, I prefer to employ the flanged collars F G', around which the expansible rings are placed. These circular collars are tapered so that the collar F, which is split lengthwise, passes over the tapering end of the collar G', and when pressure is applied upon the upper end of collar G', it will force the split portions of collar F outward, and thus expand the rings *c c*. The pressure spoken of is the weight of the column of liquid above the piston, which acts with greater or less force upon the flange of collar G' when the piston is caused to ascend. Instead of employing two tapering collars the upper one, G', will be found to answer a very good purpose when used alone, for expanding the packing. Or a simple ring, placed on top of an expansible packing, will cause it to expand by the pressure of the column of liquid.

It will be seen from the above description that I have a valve, D, applied to the lower end of the piston-rod, which, when the piston is lifted, will be held to its seat by the pressure of the column of liquid above the piston, and that, as the piston is caused to descend, will leave its seat and allow the liquid to pass up through the piston. The piston is caused to ascend by the action of the valve upon its lower end, and to descend by the action of the collar G upon its upper end.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The construction of the piston B C, with outlets *a a*, and with a valve-seat formed in its lower end for receiving a valve, D, which is applied on the lower end of the piston-rod, substantially as described.
2. The combination of the flanged tapering collars F G', and packing *c*, or their equivalents, with the piston B C *a*, and valve D, on the piston-rod E, substantially as and for the purpose described.
3. The construction of the packing expanders F G', substantially in the manner and for the purpose described.
4. The employment of a tapering flanged collar, and a split flanged collar, under, over, and back of the packing, in such manner that the column of fluid above the piston-valve will expand the packing as the piston is raised, substantially as described.
5. The pump constructed substantially as herein shown and described, so that the packing *c* is expanded laterally by the column of water being lifted, and the valve D opened and closed by a direct force or pull upon the piston, substantially in the manner described.

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