

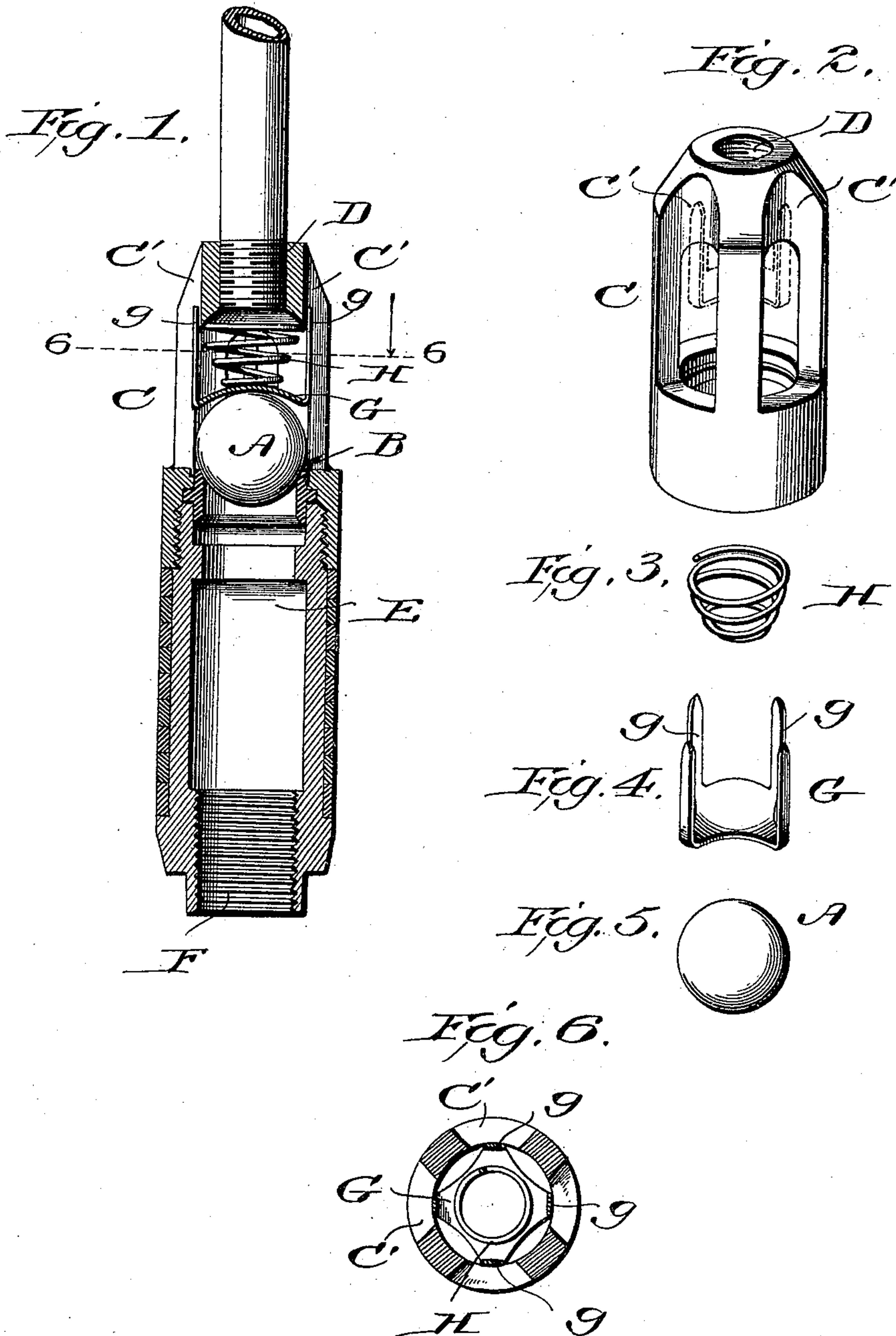
No. 619,705.

Patented Feb. 14, 1899.

F. W. KNUPP.  
VALVE.

(Application filed Jan. 18, 1898.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

FRED W. KNUPP, OF FOSTORIA, OHIO.

## VALVE.

SPECIFICATION forming part of Letters Patent No. 619,705, dated February 14, 1899.

Application filed January 18, 1898. Serial No. 667,088. (No model.)

*To all whom it may concern:*

Be it known that I, FRED W. KNUPP, a citizen of the United States, residing at Fostoria, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Valves; 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 ap-  
10 pertains to make and use the same.

In oil and gas wells it frequently happens that the ball-valve is held above its seat by the accumulation of adhesive paraffin-wax on the said seat and in the cage and by the continued pressure of the liquid or gas which  
15 has lifted it, so that the closing action of the said valve is impeded. As the valve and the neighboring parts are far below the surface of the earth and must be brought to the surface  
20 for cleansing, it becomes very important to provide some more practicable remedy. To this end I provide the ball-valve with a suitably-guided follower or thimble and a spring pressing the same on the ball to force the latter  
25 down through all such accumulations and against all such upward movement of the gas or liquid, automatically seating the said ball-valve with perfect tightness as soon as the upward movement of the piston ceases.

The said invention therefore consists, mainly, in the combination of a hollow pump-piston and valve-cage attached thereto, with a ball-valve opening upwardly within the said  
30 piston, a concave follower fitting on the said ball-valve, and a spring bearing on the said follower, substantially as set forth.

The said invention also consists in the combination, with the foregoing parts, of certain guiding devices and in certain details of construction, hereinafter particularly set forth  
40 and claimed.

The said invention further consists in the especial construction and combination of parts, hereinafter set forth and claimed.

Of course this improvement is not necessarily confined to wells or pipes of any particular kind, but may be used wherever convenient and available.

In the accompanying drawings, Figure 1  
50 represents a longitudinal central section of a tubular casing and valve-seat, ball-valve cage, couplings, follower or thimble, and spring

embodying my invention. Fig. 2 represents a perspective view of the valve-cage and the follower, the latter being shown in dotted  
55 lines. Fig. 3 represents a detail perspective view of the spring. Fig. 4 represents a similar view of the follower, and Fig. 5 of the ball. Fig. 6 represents a cross-section on the line  
60 6 6 of Fig. 1.

A designates a ball-valve of ordinary form, and B its seat, which has a valve-cage C and upper internally-screw-threaded coupling D cast therewith. E designates a tubular casing or short pipe-section having the said seat  
65 firmly secured on one end of it and provided with an internally-screw-threaded coupling-collar F at the other. G designates a follower or thimble consisting of a plate made concave to fit on the said ball-valve and provided  
70 with guiding-fingers *g*, which extend upward through the openings *C'*, that alternate with the bars of the said cage. These guiding-fingers extend above the upper ends of the  
75 said openings and overlap the closed upper end of the cage. A helicoidal spring H bears at its upper end against the conoidal upper part of said casing and at its lower end against  
80 the convex top of the said follower or thimble, being inclosed within the series of guiding-fingers of the said thimble and the bars of the said cage. These fingers by their  
85 contact with the said bars and the solid part of the cage above them tend to hold the said follower from turning, rocking, or tilting as it moves up under pressure of the gas or  
90 liquid from below against the ball or downward under pressure of the said spring. They also aid in protecting the said spring from any foreign body and keeping it accurately  
in position.

The spring yields when the piston is forced down, so that the ball-valve rises from its seat to permit the upward flow of the gas or liquid; but when the downward movement  
95 of the piston ends the force of the springs suffices to press the ball-valve back on its seat against any gaseous or liquid upward flow, which may not yet have ceased, and in spite of the resistance of any paraffin-wax  
100 that may be clogging the cage. Any such wax will be forced out through the openings *C'* or down into the casing or pipe-section E.

Having thus described my invention, what

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

In combination with a hollow pump-piston and a cage attached thereto which is provided  
5 with vertical bars having openings between them, a ball-valve opening upward within the said cage, a follower bearing on said ball-valve and provided with upwardly-turned guide-fingers, which extend outward through  
10 the openings of the said cage and alternate

in position with the bars thereof, and a spring arranged in the space inclosed by the said fingers and bars and operating to close the said valve substantially as set forth.

In testimony whereof I affix my signature 15  
in presence of two witnesses.

FRED W. KNUPP.

Witnesses:

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