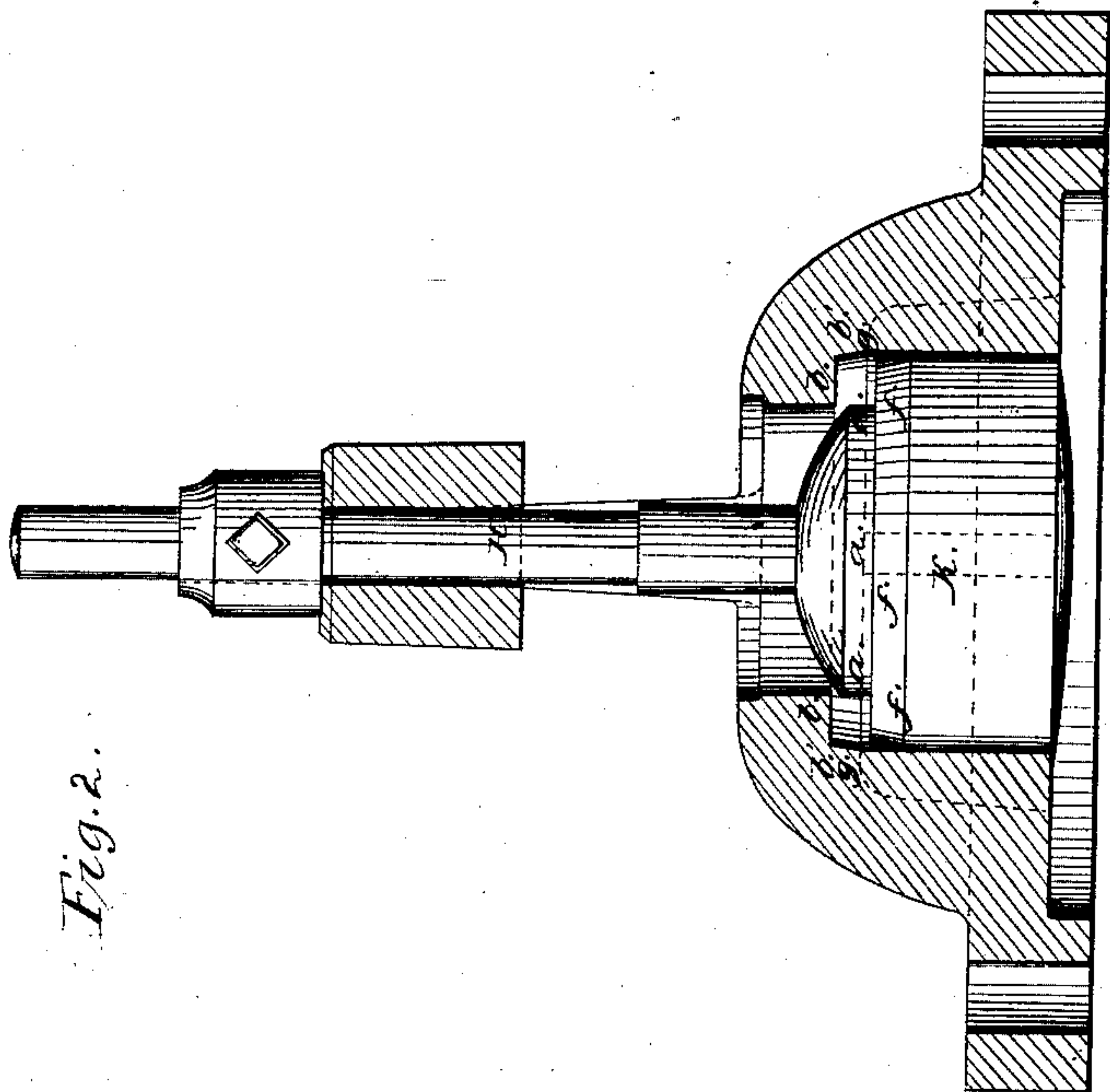


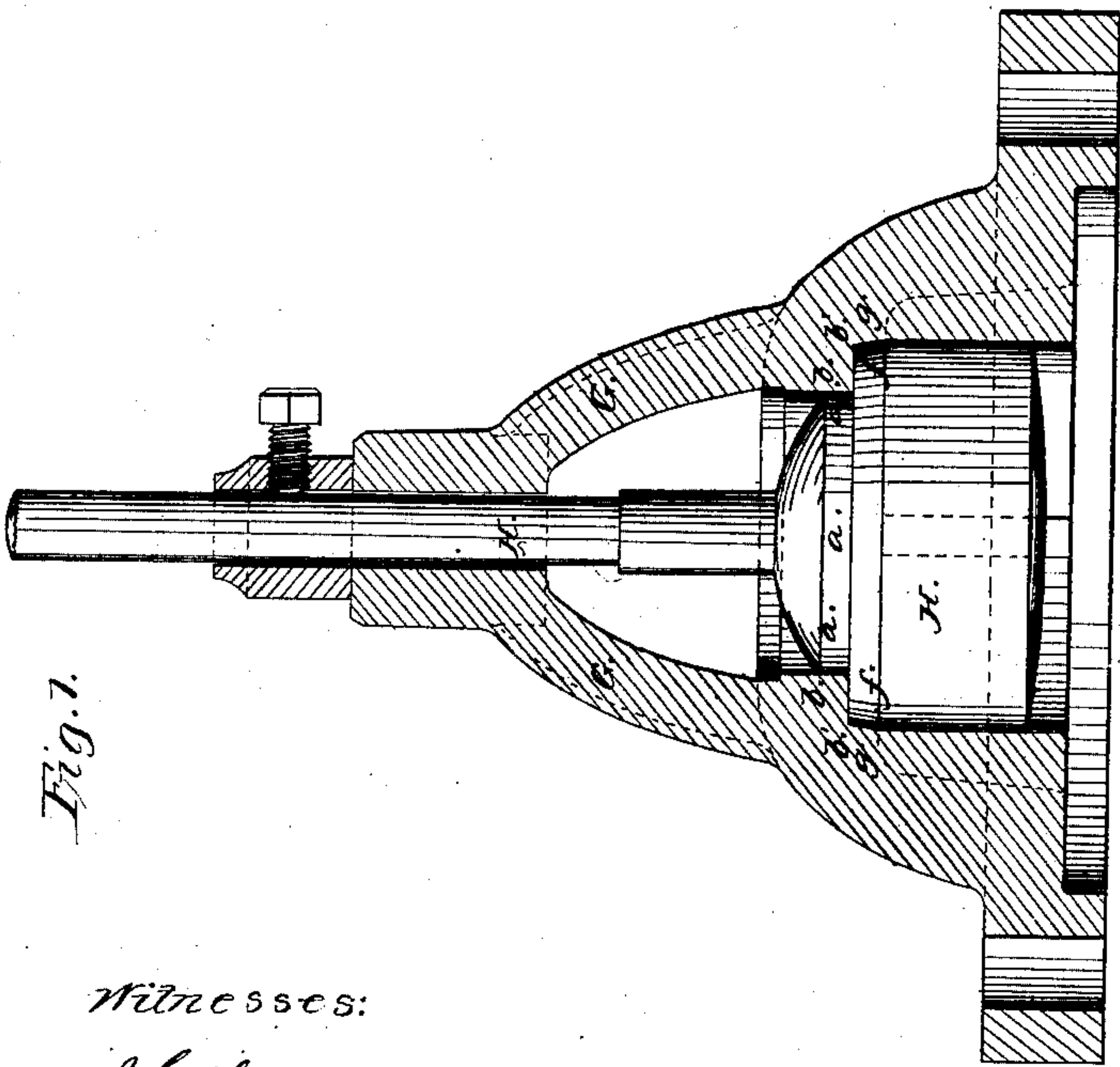
*J. C. Strode,  
Hydraulic Ram,*

*No 11,621;*

*Patented Aug. 29, 1854.*



*Fig. 2.*



*Fig. 1.*

*Witnesses:*

*J. C. Shaw.  
Stephen H. Simmons.*

*Inventor:*

*Joseph C. Strode.*



# UNITED STATES PATENT OFFICE.

JOSEPH C. STRODE, OF WESTCHESTER, PENNSYLVANIA.

## PUPPET-VALVE FOR HYDRAULIC RAMS.

Specification of Letters Patent No. 11,621, dated August 29, 1854.

*To all whom it may concern:*

Be it known that I, JOSEPH C. STRODE, of Westchester, in the State of Pennsylvania, have invented a new and useful Improvement in the Construction of Hydraulic Rams; and I do declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, represents a vertical section of the puppet valve of the hydraulic ram showing my improvement. Fig. 2, represents a similar view taken at right angles to the section shown in Fig. 1. My invention constitutes an improvement in the arrangement of a valve described in Letters Patent granted to me May 23, 1834.

It consists in such an arrangement of the puppet valve that as the puppet valve rises the water inclosed between the top of the puppet valve and the valve seat is made to escape at the side of the puppet valve down into the valve chamber.

Fig. 1 represents a section of the top of the upper part of the puppet valve and valve chamber.

K represents the puppet valve on its spindle H.

G G' is the top of the puppet valve chamber. The valve K, as in rams described in my patent heretofore mentioned has a recess *a a* extending around the upper portion. The recess *a a* slides in perfect contact like a piston within the surface *b, b*, in the top G, G'. In rams heretofore described the upper part of the puppet valve *f, f*, slides in a similar way within the surface *g, g'*, in the top of G G'.

In the use of rams having the puppet valve to slide in accurate contact with the sides of the valve seat two difficulties have been experienced. First—as the puppet valve rises, a portion of water was inclosed within the recess *a a* and as the water could neither escape above nor below, it formed an inclosed and compact mass between the puppet valve and its upper seat and by reason of the inelasticity of the water the shock of the puppet valve was communicated directly to the metal. Secondly—when the puppet valve commenced to fall a partial vacuum was formed at the recess *a a* between the puppet valve and its seat, and this partial vacuum caused the puppet valve to stick to its upper seat. For these reasons

puppet valves sliding in perfect contact with the inner surface of the top of the chamber had not come into use for hydraulic rams. In my former patent after having specified these difficulties I described a combined arrangement of tubes, one set connecting the upper part of the puppet valve chamber with the air chamber and another set communicating with the external air whereby these difficulties were overcome. My present improvement consists in a new and simple modification of the puppet valve itself whereby these difficulties are more easily and effectually obviated than by the arrangement described in my former patent.

I construct the interior of the upper part of the puppet valve chamber precisely as it has been before used and as described above with its inner surfaces *b b*. I also make my puppet valve with its recess *a, a, a* sliding in contact with *b b* like a piston; but, instead, of making the surface *f f* cylindrical so as to slide in perfect contact with *g, g*, as heretofore I make it tapering at *f, f*, and also the top of the valve seat tapering at *g, g*, so that as the puppet valve rises to its seat a small annular passage will be left open between *f, f*, and *g, g*, through which the water ordinarily retained by the recess *a a* may escape back into the valve chamber. The velocity of this escape can be regulated by the degree of taper given to *f, f*. It should be a very small passage so that the water shall escape slowly and thus offer a graduated and regular resistance to the ascent of the puppet valve to its seat and so prevent the shock of the puppet valve *k* against its upper seat *b b'*. When the puppet valve has reached its upper seat *b, b'*, *g* and it begins to fall the water finds its way slowly between *f, f*, and *g, g*, and thus prevents the formation of a vacuum between the valve *k* and its upper seat. Thus the valve *k* falls without sticking.

Fig. 2 represents a puppet valve *k* about to ascend to its seat exhibiting the space between *f, f*, and *g, g*, through which the water on top of the puppet valve is forced down into the valve chamber. And as the communication between the valve chamber and the air chamber is opened at this time the water forced down around *f, f*, is so forced against the resistance of the condensed air in the air chamber.

Fig. 1, represents a valve at its upper seat and about to descend. By this improved ar-

5 rangement of the puppet valve and chamber at *f, f*, and *g, g*, the shock of the valve and the sticking are entirely obviated and the necessity for the tubes heretofore described in my Letters Patent is dispensed with.

Having thus described my improvement what I claim and desire to secure by Letters Patent is—

10 The construction of puppet valves of hydraulic rams with the upper part of the

valve *a a*, sliding in contact with the sides *b, b*, of the valve chamber and the part *f, f*, and *g, g*, made conical or tapering in the manner and for the purpose herein described.

JOSEPH C. STRODE.

Witnesses:

J. E. SHAW,

STEPHEN R. SIMMONS.