(No Model.)

# F. W. HESS.

## VALVE.

No. 521,027. Patented June 5, 1894.

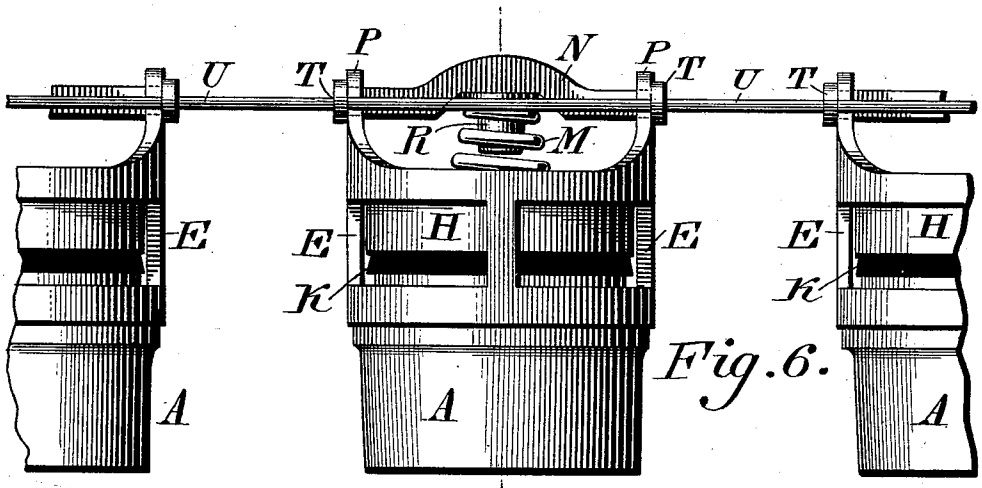



Fig. 6.

Fig. 5.

Fig. 2.

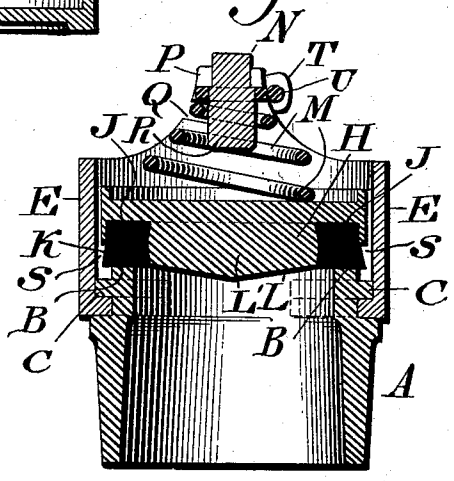
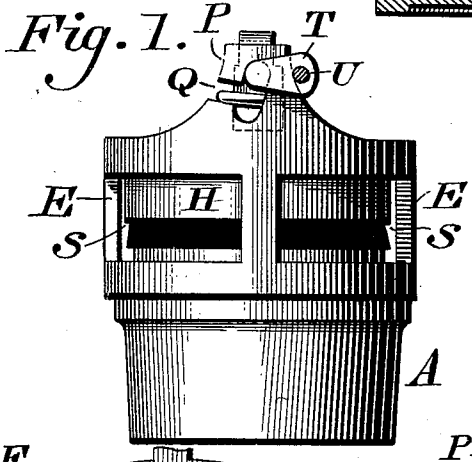



Fig. 1.



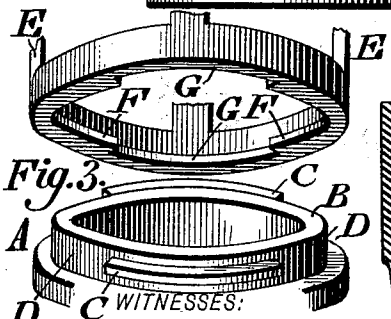




Fig. 3.

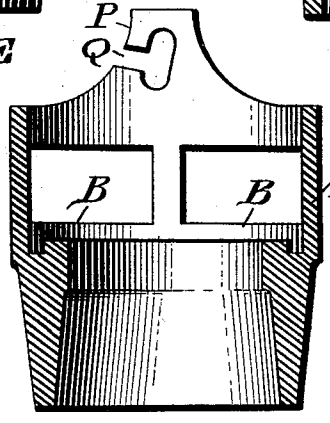



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## VALVE.

SPECIFICATION forming part of Letters Patent No. 521,027, dated June 5, 1894.

Application filed June 15, 1893. Serial No. 477,654. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK W. HESS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Valves, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of improvements in valves, whereby the valve head is adapted to rise and fall in right angular or oblique directions, so as to permit the passage through the valve of ordinary obstructions without clogging the same, the valve being further adapted to be taken apart and set up in a convenient manner, and bolts, nuts and screw threads are avoided in the construction of the same, and other advantages are presented as will be hereinafter set forth.

Figure 1 represents a side elevation of a valve embodying my invention. Fig. 2 represents a vertical section thereof on line *x*, *x*, Fig. 6. Fig. 3 represents perspective views of detached portions thereof. Fig. 4 represents a vertical section of another form thereof. Fig. 5 represents a vertical section of a valve head different from that in Figs. 1 and 2. Fig. 6 represents a side elevation of a number of valves embodying my invention, showing the manner of securing the cross heads thereof.

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

Referring to the drawings: A designates a shell forming the base of the valve, and B designates a valve seat thereon, below which on the exterior thereof are the projecting lugs C, which are separated at intervals, leaving the spaces D between them.

E designates a cage or skeleton shell which is open at top and which has on its lower end on the interior thereof the lugs F, which are separated at intervals by the spaces G, it being noticed that the lugs of the base A are adapted to enter the spaces of the cage E, and vice-versa, and when the shell is pressed down to full extent and turned, the lugs of the cage engage with the lugs of the base, thus locking said parts, it being evident that the same may be readily unlocked or disconnected when so required.

Within the cage E is the solid valve head H, on whose lower face, at or near the periphery thereof, is a recess or groove J, which is occupied by packing K, which when the valve is closed rests on the seat B, it being noticed that said head is otherwise formed solidly of metal; and that the under face L of the central portion L′ of said head receives the impact of the fluid directed through the base A.

Pressing against the top of the valve is a spiral spring M, which bears against a cross head N, the latter being fitted in ears P, which rise from the case E, and have open eyes Q, whereby the said cross head may be readily removed and reapplied. In order to prevent displacement of the upper end of the spring from the cross head, there is secured to the latter a depending stud R, which enters the coils of the spring. It will be seen that the head H rises and permits the fluid to pass through the base and cage, and as the head freely occupies the case, and there is a space S between the head and cage, and thus the head may rise and fall in right angular or oblique directions, so as to adapt itself to any fish, sticks or other obstructions that may pass through the valve, thus avoiding clogging of the latter. Owing to the spiral form of the spring and the comparative small length of the stud R, which normally projects below only a portion of the convolutions of said spring, the one side of the head H is permitted in its oblique movement to rise nearly to the top of the cage, while the other side may remain seated, thereby affording a wide opening for the escape of the obstruction. In order to retain the cross head in position and prevent accidental displacement of the same, the ends of the former are provided with eyes T, which extend radially therefrom, and receive a rod U which serves to lock said cross head to the cage and prevent it from emerging from the ears P, until properly removed. This rod may be employed to control the cross heads of several valves as shown in Fig. 6, it being evident that in either case, when said rod is removed, the cross head may be displaced, the spring and valve head be withdrawn from the cage, and the latter disconnected from the base, after which the parts may be again readily set up.

When desired, the base and cage may be formed in one piece as in Fig. 4, and when it

is not required to pack the valve head, the same may be of the form shown in Fig. 5, the packing K being avoided, but it is evident that when said packing is employed, and the same wears out, it may be readily removed and renewed or replaced.

The base A may be attached to the valve plate of a pump in any suitable manner.

It will be seen that no bolts or nuts are employed in the construction of the valve, and that no wrench is required to adjust the same. It will also be seen that I avoid guards in the center of the valve seat, and taper bolts, which cause leakage and become loose and permit the parts to fall into the pump cylinder, and that the valve head wears uniformly and seats itself true and tight upon its seat, and other advantages present themselves as will be evident to those familiar with the art.

The groove in the valve head may be packed with rubber, lead, Babbitt metal or other suitable material.

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

1. A valve cage having an open top and provided with a base having a valve seat, a detachable cross bar secured to said cage and having a depending stud, a valve head with packing resting on said seat and provided with a central portion adapted to receive on its under face the impact of the fluid passing through the said base, and a spiral spring bearing against said head, said head loosely fitting in said cage, and said stud normally projecting into a portion only of the convolutions of said spring, said parts being combined substantially as described.

2. A valve cage having an open top and provided with a detachable base having a valve seat therein, a detachable cross bar secured to said cage and provided with a depending stud, a valve head in said cage having a central portion adapted to receive on its under face the impact of the fluid passing through the said base, and a spiral spring bearing against said head, and having only a portion of its convolutions normally encircling said stud said head being limited in its upward movement by contact with said stud, said parts being combined substantially as described.

3. In a valve, a cage, a valve head therein, a spring bearing on said head, and a cross head connected with said cage and controlling said spring, said cross head having ears in which is fitted a securing rod or pin, substantially as described.

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