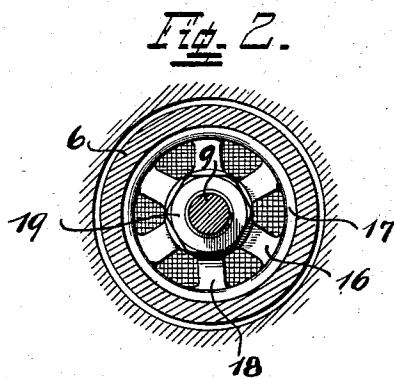
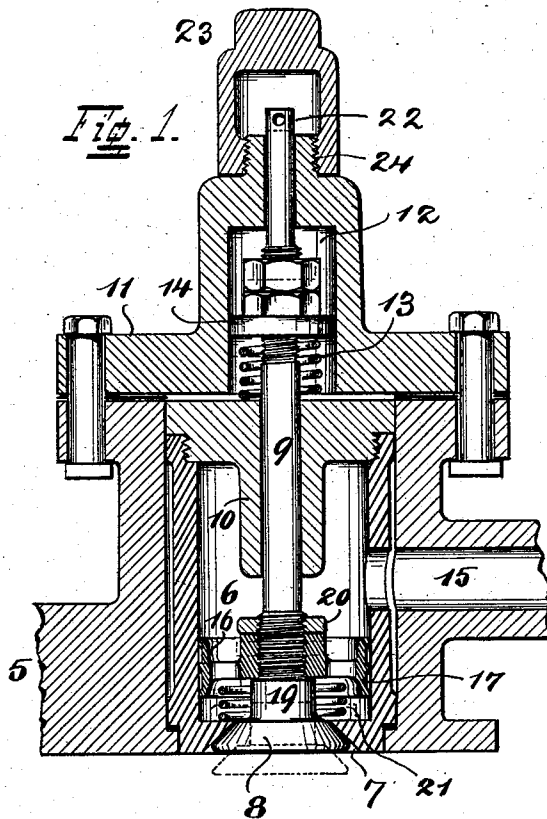


(No Model.)

W. F. NIEBLING.
VALVE GUARD.

No. 567,279.

Patented Sept. 8, 1896.



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UNITED STATES PATENT OFFICE.

WILLIAM F. NIEBLING, OF CINCINNATI, OHIO.

VALVE-GUARD.

SPECIFICATION forming part of Letters Patent No. 567,279, dated September 8, 1896.

Application filed November 1, 1895. Serial No. 567,628. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. NIEBLING, a citizen of the United States, and a resident of Cincinnati, Hamilton county, State of Ohio, have invented a certain new and useful Valve-Guard; and I do 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 appertains to make and use the same, attention being called to the accompanying drawings, with the reference-numerals marked thereon, which form a part of this specification.

This invention relates to valves such as are used in connection with the cylinders of pumps, compressors, and similar machines.

It relates more particularly to the valves of compression-pumps used in connection with ice-machines. In these pumps a breakage of the valve-stem occurs frequently by reason of the hard wear of the parts, due to the heavy pressure. After such has occurred the valve, not being restrained in any way, drops into the cylinder, whereupon by the next stroke of the piston, being in the way of the latter, it is shoved against one of the cylinder-heads with the inevitable result of bursting the same. Great damage to property is always caused by these explosions, frequently accompanied by loss of life.

Various means have been devised to prevent the valve from dropping into the cylinder after broken from its stem, and a new and improved device for this same purpose forms, therefore, the subject of my invention, of which the following specification and claim contain a complete description, together with its operative parts and construction, which latter is also illustrated in the accompanying drawings, in which—

Figure 1 shows in a vertical section part of the head of a compression-pump containing one of the valve-chambers and valve. Fig. 2 is a horizontal section of the valve-chamber, taken on a line above the valve.

5 is a part of the head, parts of which are open and extended outwardly to provide the necessary room for the reception of the valve-chambers 6. The lower or inner end of the latter is contracted and forms the valve-seat 7 thereat.

8 is the valve, fitted to be seated against it,

connecting to or forming part of the valve-stem 9. The valve is guided by the valve-guide 10, which receives the stem of the former and which is suitably secured, in this case to the upper or outer end of the valve-chamber. This latter with all its parts is held in position by a head 11, secured to the outwardly-extended part of the head 5. Head 11 is also extended outwardly and forms a spring-housing 12, containing a spring 13, which, by bearing against a shoulder 14 on the valve-stem, keeps the valve normally seated. The gas or other matter to be pumped enters through a pipe 15. It is usually at the thin part where the valve-stem breaks, whereupon, unless preventive means are employed, in upright pumps the valve drops immediately into the cylinder, while in horizontal pumps, if it does not do so at once, it rests in a tilted position, which prevents it from becoming evenly seated.

The dropping of the valve into the cylinder is prevented by securing a projection or guard 16 to the lower thicker part of the valve-stem immediately back of the valve and so close to the latter as the required clearance for its movement permits. This projection extends far enough out to meet and partly overlap an inward projection of the valve-chamber, which projection is either purposely designed or may be formed by the inwardly-contracted inner end of the valve-chest, which forms the valve-seat 7. The projection obtained in the latter way is the most practical construction. It is evident that if the valve-stem breaks the valve can only drop to the extent of its usual movement, in which position it will hang suspended by reason of the outward-projecting guard back of it meeting with the inwardly-projecting parts of the valve-chest. On the next stroke of the piston the valve will be simply pushed against its seat and no damage can result. This projecting guard should also act as a guide to hold the valve central and prevent it from tilting, so that it may come evenly to its seat when pushed by the piston. For such purpose it is shaped as shown in Fig. 2 by having a continuous rim 17, fitting the bore of the valve-chamber and secured by arms 18 to a central hub, through which the valve-stem passes. It may be secured to the latter in any suitable way. In this case

it rests against shoulder 19 on the stem, with a lock-nut 20 placed against it from the other side. The outer face of rim 17, which bears against the inner surface of the valve-chest, is preferably recessed, as shown in Fig. 1, to reduce friction. Spring 13 might be transposed and be placed below the guard 16, or an additional spring 21 might be used to assume the function of the former spring in case the valve-stem is broken, whereby the first spring is prevented from acting on the valve for the purpose of closing it. To be enabled to readily detect any disorder of the valve or breakage of the stem, this latter is extended outwardly through the end of spring-housing 12, so as to be visible. In case of a breakage this visible end 22 would of course be motionless. Ordinarily it is covered by a readily-removable screw-cap 23, screwing onto a threaded boss 24 at the outer end of housing 12. In a valve thus guarded it is not necessary to have any clearance at the end of the piston-stroke, and the piston may move up close to the head, whereby any reexpansion of the once-compressed gas is avoided and a more economical operation of the pump obtained.

It is evident that the specific construction of the valve and its chest, as described, has no particular relation to my improvement, which may be adapted to most of the present forms of valves.

Having described my invention, I claim as new—

In combination with a valve-chest having inwardly-projecting parts, a valve connected to the valve-stem, means to guide the latter, a shoulder 19 thereon, immediately back of the valve, a guard 16, consisting of a hub fitted around the valve-stem and against shoulder 19 thereon, arms 18 projecting therefrom and a rim 17 supported by them, which latter fits against the interior surface of the valve-chest, whereby the valve is held to the valve-chest and centrally guided independently of the valve-stem and a lock nut 20, bearing against the hub of guard 16, to hold it in position against shoulder 19.

In testimony whereof I hereunto set my signature in presence of two witnesses.

WILLIAM F. NIEBLING.

Witnesses:

C. SPENGEL,
ARTHUR KLINE.