

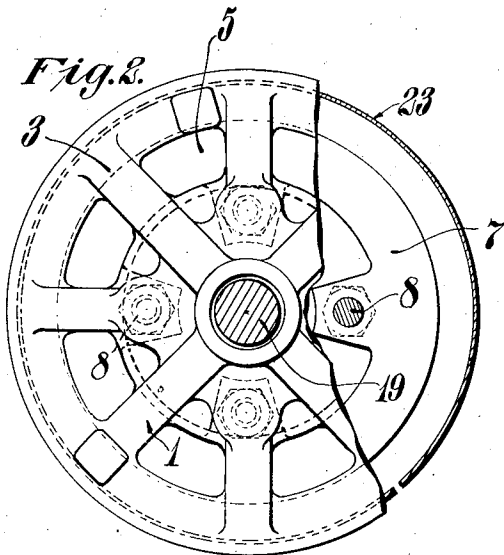
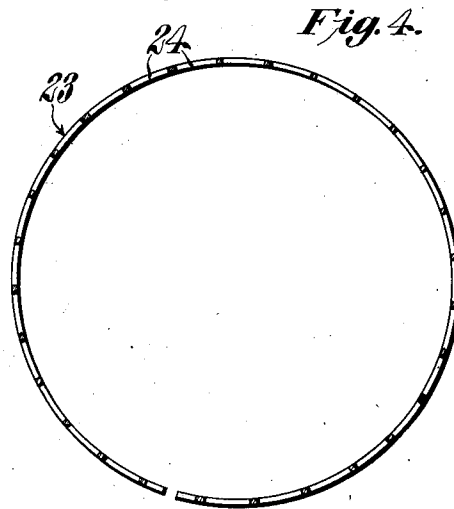
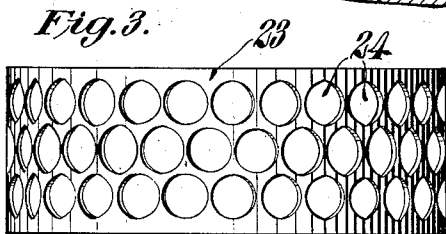
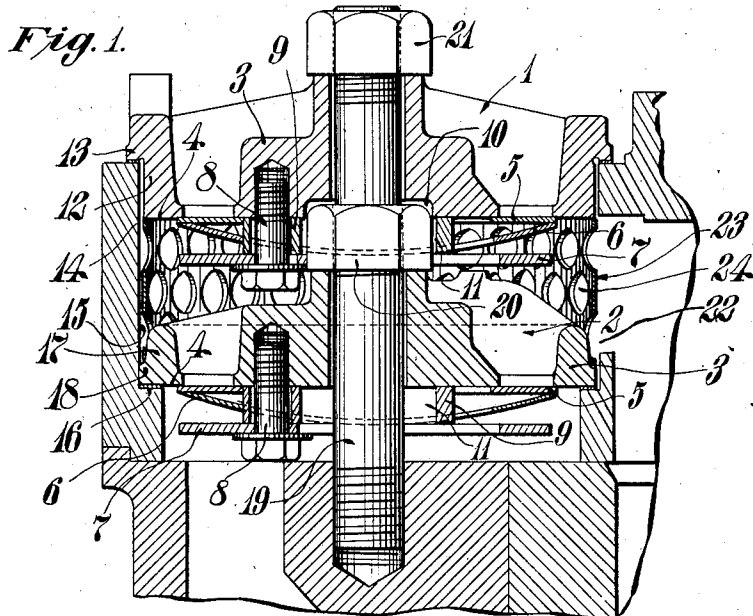
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H. T. BLOM

VALVE SHIELD

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## UNITED STATES PATENT OFFICE.

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## VALVE SHIELD.

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This invention relates to compressor cylinder protecting mechanism, and more particularly to valve guard means.

It has for its object to provide improved means for protecting a cylinder with which is associated valve mechanism. In mechanisms employing pistons and cylinders having associated therewith suitable valve mechanism for controlling fluid flow it sometimes happens that some part of the valve mechanism becomes broken and enters the cylinder, resulting in damage thereto. This is particularly liable to happen where the valve mechanism comprises relatively thin flexible plate valves and springs which are particularly efficient in compressor valve mechanisms. It is an object of the invention to provide improved means for preventing broken parts from falling into the cylinder. Another object is to provide improved cylinder protecting means disposed within the passages leading to the cylinder and particularly to surround valve mechanism disposed within the passages. A further object of the invention is to provide improved means adapted to be associated with a well known form of valve mechanism without in any way altering the existing structure thereof. Another object is to provide improved means whereby the flow of fluid to the cylinder will not be substantially interrupted yet which will be efficient in preventing any broken pieces of the valve mechanism from being drawn into the cylinder. A further and more specific object of the invention is to provide an improved perforated annular member adapted to be inserted between coaxial inlet and exhaust valve mechanism.

In the accompanying drawings I have shown for purposes of illustration one form which my invention may assume in practice.

In these drawings,—

Fig. 1 is a longitudinal section of a valve mechanism having associated therewith my improved protecting means.

Fig. 2 is a plan view partially broken away to show the space relation of my guard to the valve mechanism.

Fig. 3 is a side elevation of the improved protector or valve guard.

Fig. 4 is a sectional plan view thereof.

In the illustrative embodiment of my invention I have shown the same associated with coaxial intake and exhaust valve mechanisms 1 and 2 respectively which are of a

well known type although it will be understood that my improved means broadly could be used with only a single valve mechanism or with valve mechanisms of different types such as poppet valves, rotary valves, or the like. The two valve mechanisms herein shown for illustrative purposes each comprise, with certain exceptions to be noted, a ported valve seat member 3 having a lower ground seating surface 4 for a valve 5 held thereagainst by a transversely bowed spring 6 which rests against a valve guard 7. The several elements named are held in position by cap screws 8 passing through a valve guide 9 which also rests against the surface 4. Recesses 10 and 11 are formed in the lower portion of the upper member 3 and in guides 9 respectively. In order suitably to hold the valve mechanism 1 in position a large annular flange 12 and radial flange 13 are provided which are supportable upon a suitable gasket placed against the upper end of the wall 14 which forms a valve mechanism receiving chamber 15. An inwardly extending seating surface 16 supports the lower surface 4 of the seat member of valve mechanism 2. It is to be noted that this latter valve mechanism differs from the other by having an annular flange 17 and a radial flange 18. The two mechanisms are centrally disposed upon a stud 19 and held thereon by nuts 20 and 21.

The mechanism so far described is of a well known construction and controls flow of fluid to and from the cylinder by way of a passage 22. To prevent any parts of the valve mechanism such as the valve spring and plate, which might break during operation, from entering the passage 22 and possibly the cylinder, I have provided improved means disposable between the ports of the valve mechanism and the cylinder, herein comprising an annular guard or cylinder protecting means 23 which is of relatively thin material, preferably made of brass or other suitable flexible material. This guard 23 may be formed from a flat piece of metal having a series of openings 24 and bent into its proper shape so as to be disposable against the surface 4 and the flange 18 of the mechanisms 1 and 2 respectively. If desired, the guard may only be lightly held in position by the friction with the sides of the flanges 17 or the same could be vertically clamped between the valve mechanisms during clamping of the

upper valve mechanism 1. It will be noted that the openings 24 are relatively great in number and staggered so as to provide the maximum amount of flow area consistent with the maximum amount of guarding structure for the valve mechanism. It will of course be understood that other suitable guard means may be employed instead of the annular member 23, such as wire gauze or the like and that the same may be made in a variety of forms and disposed in many different locations such as directly in the passage 22 or the like, all with the object of preventing any broken parts of the valve mechanism or foreign elements from entering the cylinder.

While I have in this application specifically described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In combination, a plurality of coaxially disposed valve mechanisms each including seat, valve and guard members, and broken valve part guard means disposed between the adjacent sides of said mechanisms and held in position by said mechanisms jointly.

2. In combination, a plurality of coaxially disposed valve mechanisms each including seat, valve and guard members, and broken valve part guard means disposed between the adjacent sides of said mechanisms and held in position by said mechanisms jointly, one of said mechanisms having means for maintaining said protecting means in a central relation to both of said mechanisms.

3. In combination, a plurality of coaxially disposed valve mechanisms having plate valves associated therewith one of which is

disposed between said mechanisms, and means disposed between said mechanisms and contacting with each of the same for limiting movement of a broken part of said intermediate valve in the event of breakage of the latter.

4. In combination, a plurality of coaxially disposed valves one of which has radial and annular flanges, and cylinder protecting means adapted to have slidable engagement with said annular flange and seated upon said radial flange.

5. A cylinder having a valve receiving chamber connected therewith through an opening extending transverse to said chamber, valve means in the chamber including seat, guard and valve members, the last moving in a direction transverse to said opening, and means between the valve means and the opening leading to the cylinder bore, preventing passage of fragments of the valve into the cylinder bore in the event of fracture of the valve means.

6. A cylinder, valve mechanism disposed in an opening in said cylinder, said opening communicating with the cylinder bore, and cylindrical protecting means formed with openings through its walls for the passage of fluid, said protecting means being disposed around said valve mechanism between the same and said cylinder.

7. A cylinder, a ported valve element disposed in an opening in said cylinder in communication with the cylinder bore, a movable valve member cooperating with said element and disposed between the same and said cylinder bore, and cylindrical protecting means surrounding said valve member and having openings through its walls for the passage of fluid, said protecting means being disposed between said valve member and said cylinder.

In testimony whereof I affix my signature.

HJALMAR T. BLOM.