

(No Model.)

R. H. MARSHALL.

COCK.

No. 307,209.

Patented Oct. 28, 1884.

Fig. 2.

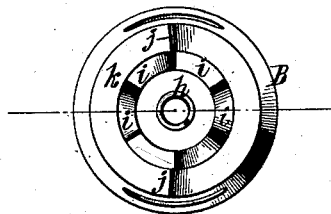


Fig. 1.

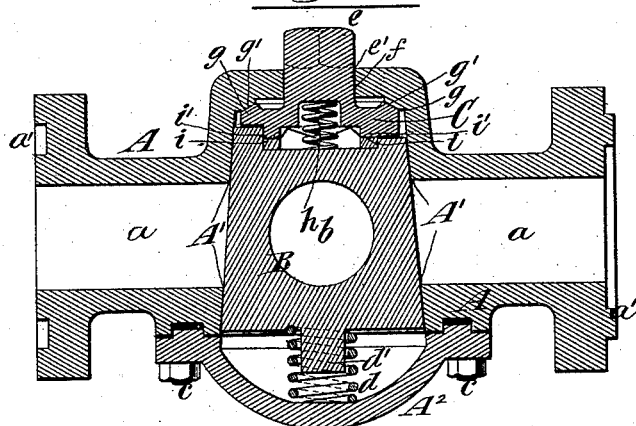


Fig. 4.

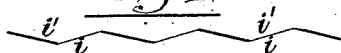
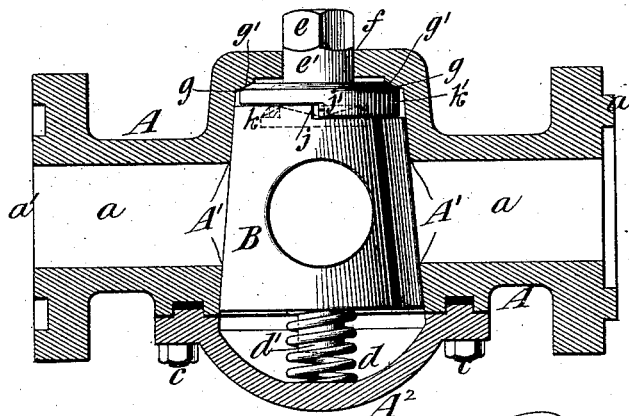


Fig. 3.



Witnesses:-

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UNITED STATES PATENT OFFICE.

ROBERT H. MARSHALL, OF NEW YORK, N. Y.

COCK.

SPECIFICATION forming part of Letters Patent No. 307,209, dated October 23, 1884.

Application filed May 3, 1884. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. MARSHALL, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Cocks, of which the following is a specification.

Although my invention may be embodied in cocks or plug-valves for various purposes, it is especially intended for cocks used for controlling the passage of ammoniacal gas in refrigerating apparatus. For this purpose cocks of large size are used, and the plugs must be nicely fitted to the shells in order to form tight joints. The power required to turn the plugs is great, and the plugs and shells are subjected to rapid wear.

The cocks now in use for the above purpose have bonnets or caps at both ends of the plug, and are also objectionable for the reason that before the plug can be turned the bonnet or cap at one end thereof must be taken off, and must be replaced after the plug has been turned.

One object of my invention is to provide a cock in which the first turning movement of the key or wrench shall serve simply to loosen the plug in its taper or conical seat, while the turning of the plug in either direction to open or close will be effected by the further operation of the wrench or key; and another object of the invention is to avoid the necessity of unbolting and removing and afterward replacing a cap or bonnet every time the plug is to be turned to open or close.

The nature of the invention will be hereinafter fully described, and then pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional view of a cock embodying my invention. Fig. 2 is an end view of the plug removed from the shell. Fig. 3 is a view similar to Fig. 1, the shell only being sectioned, and Fig. 4 is a diagram hereinafter described.

Similar letters of reference designate corresponding parts in all the figures.

A designates the shell of the cock, which is made of cast metal, as usual, and which has a direct passage or way, *a*, and flanges *a'*, for the attachment of pipes.

B designates the plug, which has a direct way or passage, *b*, and which is taper and fitted to a conical seat, *A'*, in the shell A. At the

larger end of the plug-seat the shell is closed by a cap or bonnet, *A²*, which is permanently secured thereto by bolts *c*, and the plug B, as here shown, is held tightly in its seat by a spiral or other spring, *d*, arranged between its larger end and the bonnet or cap *A²*, and held in place by a teat or projection, *d'*, on the end of the plug, or in any other suitable manner. This cock differs essentially from those in common use, in that the square or polygonal shank *e*, which projects from the shell, and to which a wrench or key may be applied for turning the plug B, is not formed upon the plug itself, but forms part of an end piece, C, which is arranged in the shell A at the smaller end of the plug. That end of the plug-seat *A'* is closed by the metal of the shell, leaving only a small opening, *f*, in which a round part, *e'*, of the shank *e* snugly fits. The piece C has a valve-face, *g*, which is fitted to a ground valve-seat, *g'*, in the shell, and a tight joint is always maintained between the valve face and seat *g g'* by a spring, *h*, arranged between the piece C and the smaller end of the plug B, as best shown in Fig. 1. The spring *d* is of greater power than the spring *h*, and hence the spring *d* will overcome any tendency of the spring *h* to force the plug B from its seat *A'*.

On the end of the plug B, and upon the piece C, are circular cam-faces *i i'*, which consist of a series of reversed inclined planes, as indicated by the diagram, Fig. 4, which shows a development of these surfaces in one plane, and hence it will be seen that whenever the piece C is turned its circular cam-face *i'* will act upon the corresponding cam-face, *i*, of the plug, and so press the plug downward or outward in its seat against the force of the spring *d*. The piece C and plug are formed with corresponding checks or shoulders, *j' j*, which are most clearly shown in Fig. 3, those *j* on the plug being also shown in Fig. 2. These checks may be formed in any convenient manner; but as here shown the plug and piece C are formed with segmental projections *k k'*, each slightly less than half the circumference of the parts, and the ends of these segmental projections form the shoulders *j j'*. When the wrench or key is applied to the shank *e*, the first turning movement simply causes the inclines of the cam-face *i'* to act on the inclines of the cam-face *i*, and so eases the plug in its seat; but as soon as

either of the check-shoulders *j'* (according to which direction the plug is turned) comes against the corresponding check-shoulder, *j*, on the plug, the latter will be turned with but little effort to open or close. This easing of the plug in its seat before turning greatly reduces the wear upon it and its seat, and increases the durability and tightness of the cock. No gas or other fluid can escape around the shank *e*, because the valve face and seat *g g'* are always held tightly in contact by the spring *h*, and no gas or fluid can escape at the opposite end of the plug because of the permanently-attached cap or bonnet *A*².

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a cock-shell having a taper plug-seat, of a plug fitted to said shell, and an end piece or head fitted in the smaller end of the plug-seat, and provided with cam-surfaces for acting upon the plug, and with checks for engaging with the plug, whereby provision is afforded for easing the plug in its seat by the first turning movement of said end piece or head, and for turning the plug by a further movement of said end piece or head, substantially as and for the purpose herein described.

2. The combination, with a cock-shell having a taper plug-seat, of a plug fitted to said shell, a spring acting on the larger end of the plug to force it into its seat, and an end piece or head fitted in the smaller end of the plug-seat, and provided with cam-surfaces for acting on the plug, and with checks for engaging with the plug, whereby provision is afforded for easing the plug in its seat against said spring by the first turning movement of the

end piece or head, and for turning the plug by a further movement of said end piece or head, substantially as and for the purpose herein described.

3. The combination, with the shell having the taper plug-seat *A'*, of the plug and head *B C*, fitted in said shell, and provided at their adjacent faces with circular cam-faces *i i'*, whereby the said head, when first turned, will ease the plug in its seat, and also provided with checks whereby the said head, in its continued movement, will turn the plug, substantially as and for the purpose herein described.

4. The combination, with a cock-shell having a taper plug-seat and a circular valve-seat, *g'*, at the smaller end thereof, of a plug and separate end piece or head fitted to said plug-seat, and provided with cam-faces and checks, as described, the said end piece or head being also formed with a valve-face, *g*, fitted to the said seat *g'*, and a spring introduced between said plug and end piece or head, for maintaining a tight joint between the valve face and seat *g g'*, substantially as herein described.

5. The combination, with the shell *A*, formed with the plug-seat *A'* and valve-seat *g'*, of the plug and end piece or head, *B C*, provided with cam-faces and checks, as described, the said end piece or head being formed with a valve-face, *g*, and shank *e*, the bonnet *A*², the spring *h* between the said plug and head, and the stronger spring *d*, for holding said plug to its seat, substantially as herein described.

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Witnesses:

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MATTHEW POLLOCK.