(Model.)

S. G. BRYER.

STEAM ACTUATED PISTON VALVE.

No. 248,994. Patented Nov. 1, 1881.

Fig. 2.

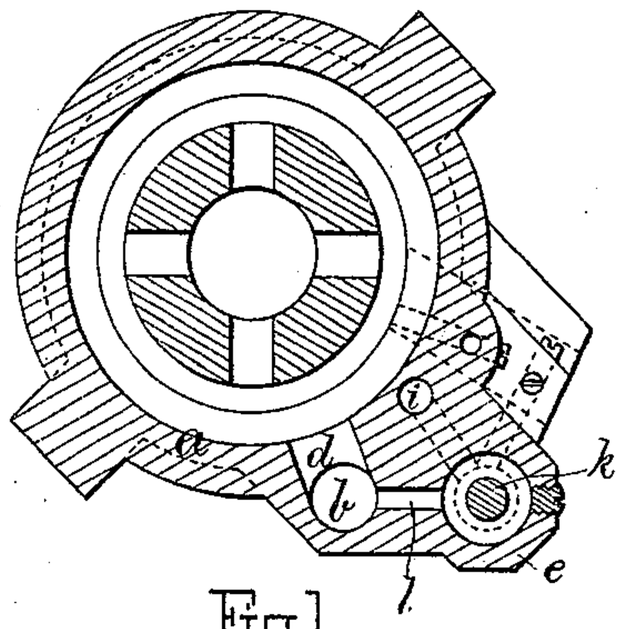

Fig. 1.

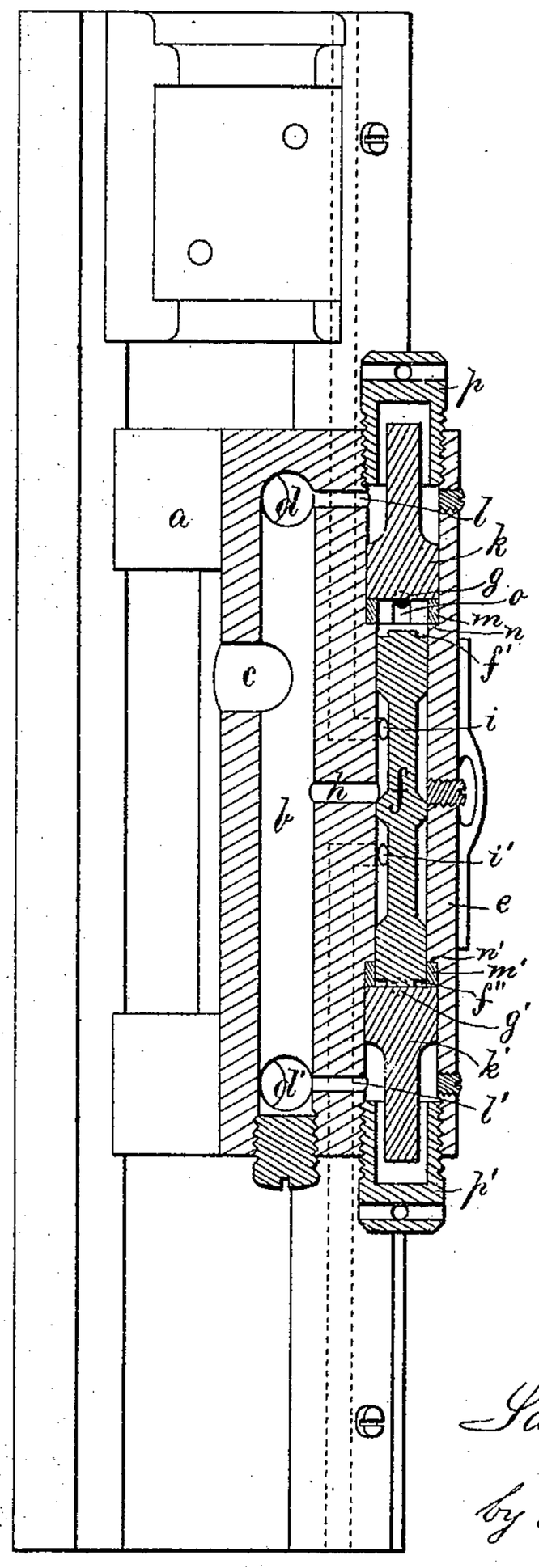

Fig. 3.

Witnesses.

Henry Chadbourn.

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by Albert Andrew.

his atty.

UNITED STATES PATENT OFFICE.

SAMUEL G. BRYER, OF SAUGUS, MASSACHUSETTS.

STEAM-ACTUATED PISTON-VALVE.

SPECIFICATION forming part of Letters Patent No. 248,994, dated November 1, 1881.

Application filed March 7, 1881. (Model.)

To all whom it may concern:

Be it known that I, SAMUEL G. BRYER, a citizen of the United States, residing at Saugus, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Piston-Valves; and I hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention relates to improvements on steam-actuated piston-valves for pumps, rock-drills, steam-engines, and other motors actuated by steam, air, or water pressure; and it consists, in combination with the piston-valve, of a movable piston-plug in each end of the valve-chamber and a direct and constant communication from the live-steam or other pressure supply to the rear ends of said piston-plugs, by which arrangement the latter are made to serve as elastic cushions for the piston-valve to strike against at the ends of its stroke, the pressure of steam, air, or water behind them forming the elastic and yielding medium to take up the shock of the reciprocating piston-valve, and thus to prevent it from going too far in either direction. By this arrangement I produce elastic cushions for the piston-valve which are very durable, simple in construction, and better suited for the purpose than the coiled springs or other mechanical springs heretofore used to accomplish a similar result.

The invention is shown in the accompanying drawings as applied to a rock-drill cylinder; but it is equally well adapted to other machines, as hereinabove mentioned.

I prefer to locate a detachable ring within the valve-chamber, at the inner end of each of the piston-plugs, which ring rests against a shoulder in the valve-chamber and serves as a stop against which the piston-plug is held by the pressure behind. Such rings may be removed when worn and new ones of the proper depth substituted. Each of such rings has an opening or perforation on one side to allow the steam or pressure to enter between the valve and inner end of the plug from the inlet-opening located opposite to such perforation in the said ring.

On the drawings, Figure 1 represents a longitudinal section of the valve-chamber and side view of a rock-drill cylinder. Fig. 2 represents a cross-section on the line A B, shown in Fig. 1. Fig. 3 represents a plan view of one of the detachable stop-rings.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a is the cylinder of a rock-drill, as usual, having on one side thereof the induction-chamber *b*, with steam-supply pipe *c*, and passages *d* and *d'*, leading to the interior of the cylinder *a* in the ordinary way.

e is the valve-chamber on one side of the cylinder *a*, as shown. Within the valve-chamber *e* is the piston-valve *f*, movable up and down or in a line with the valve-chamber. The valve *f* is actuated by steam entering through the openings *g* and *g'* at each end of the valve-chamber, as usual.

h is a channel leading from the induction-chamber *b* to the valve-chamber *e*, and *i* and *i'* are openings leading from the valve-chamber to the upper and lower ends of the cylinder *a* in the ordinary manner.

k and *k'* are the movable piston-plugs, located in the upper and lower ends of the valve-chamber *e*, as and for the purpose described.

l and *l'* are channels or ports leading from the induction-chamber *b* to the valve-chamber *e*, and respectively to the rear of the piston-plugs *k* and *k'*, as and for the purpose set forth. The inner ends of the piston-plugs *k* and *k'* come to a stop, respectively, against the stop-rings *m* and *m'*, which are resting against shoulders *n* and *n'* within the valve-chamber *e*, as shown in Fig. 1. Each of the rings *m* and *m'* is provided with a perforation or opening, *o*, opposite the openings *g* and *g'*, so as to admit the steam to enter and pass off to and from each end of the piston-valve *f*.

f' and *f''* are annular grooves or recesses, respectively, in the upper and lower ends of the piston-valve *f*, so as to allow the steam to enter between the end of said piston-valve and either of its movable piston-plugs *k* and *k'*, when it is brought against either of the latter, without closing the passages *g* and *g'*.

p and *p'* are removable screw caps or covers at the upper and lower ends of the valve-chamber *e*, either of which may be removed to get access to either of the plugs *k* or *k'* and

their stop rings *m* or *m'*, as may be desired, for repairs or otherwise. It will thus be seen that a direct and constant steam or other pressure is produced at the rear ends of the piston-plugs *k* and *k'*, which serves as a cushion on which the piston-valve acts when it comes in contact with either of the movable piston-plugs *k* and *k'* at the end of its upper and lower stroke.

What I wish to secure by Letters Patent, and claim, is—

1. In combination with the reciprocating piston-valve *f*, the yielding piston-plugs *k* and *k'*, located at each end of the valve-chamber *e*, and the channels *l* and *l'* from the pressure-supply to the rear ends of the piston-plugs *k* and *k'*, as and for the purpose set forth.

2. In combination, the movable piston-valve *f*, the movable piston-plugs *k* and *k'*, and their perforated stop-rings *m* and *m'*, all arranged within the valve-chamber *e* in a manner and for the purpose as specified.

In testimony whereof I have affixed my signature in presence of two witnesses.

SAMUEL G. BRYER.

Witnesses:

ALBAN ANDRÉN,

HENRY CHADBOURN.