

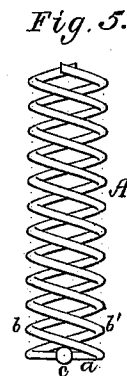
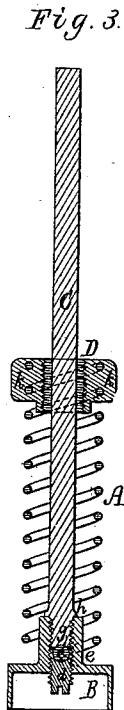
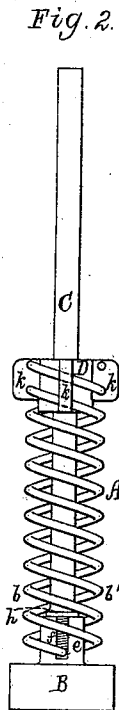
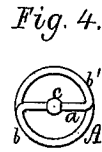
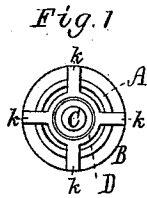
(No Model.)

G. W. BROWN.

SPRING CONNECTION FOR INDICATOR PISTONS.

No. 256,281.

Patented Apr. 11, 1882.



Witnesses.

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UNITED STATES PATENT OFFICE.

GILMAN W. BROWN, OF WEST NEWBURY, ASSIGNOR TO CROSBY STEAM GAGE AND VALVE COMPANY, OF BOSTON, MASSACHUSETTS.

SPRING-CONNECTION FOR INDICATOR-PISTONS.

SPECIFICATION forming part of Letters Patent No. 256,281, dated April 11, 1882.

Application filed October 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, GILMAN W. BROWN, of West Newbury, of the county of Essex and State of Massachusetts, have invented a new and useful Improvement in the Pistons and Springs thereof of Steam-Engine Indicators; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, in which—

Figure 1 is a top view. Fig. 2 is a side elevation, and Fig. 3 a longitudinal section, of an indicator-piston and its spring embracing my invention. Fig. 4 is a bottom or lower end view, and Fig. 5 a side elevation, of the spring.

The nature of my invention is defined in the claims hereinafter presented. Indicator-springs, so far as I know to the contrary, have heretofore been composed of a piece of wire bent in the form of a single spiral, or they have been made of two intertwisted spiral springs and a screw-threaded head and nut fixed to them at their ends, such head and nut being grooved spirally to receive the coils of the springs, which were fastened in place in the grooves by solder run therein.

My improved spring, as shown at A, is a wire which for a short portion, *a*, at its middle is straight, or substantially so, the remainder or parts *b b'* of the wire being bent in the forms of two separate spirals, like the threads of a double-threaded screw, the coils of each spiral being between those of the other, as represented. At the middle of the portion *a* is a small sphere or ball, *c*, which rests in an adjustable step, *d*, such step being a screw arranged within the piston-head B in manner as represented, and having a concavity in its upper end to receive the lower part of the ball. The said piston-head is provided with a short tubular shank, *e*, slotted longitudinally and diametrically, as shown at *f*, to receive the portion *a* of the spring, in order to prevent the head from turning more than necessary independently of the spring.

The lower end of the piston-rod C has in it a concavity, *g*, to receive the upper part of the ball *c*, the said rod being screwed into the shank of the piston-head and to a shoulder, *h*, formed on the said rod. With the piston-rod

head so constructed and applied they become not only connected to each other, but the spring has a ball-and-socket bearing at the middle of its lower end, whereby it is supported and can operate to better advantage relatively to the piston-head than when it is composed of a single spiral of wire.

The screw-nut D, by which the upper part of the spring is secured to the cylinder-head, is provided with a series of radial wings, *k*, extending from it in manner as shown, each of such wings being perforated with holes open only at their ends, and going laterally through the wing, such holes being to receive the spirals of the spring, which go through the said holes and are arranged in the said wings, in manner as shown. This adaptation of the nut and spring prevents them from becoming accidentally separated while in use, as they are liable to be when the nut is simply grooved to receive the coils, and the latter are held in the grooves by solder. With my improvement each coil, where within a wing, is wholly surrounded by the metal of the wing, which prevents the coil from being forced laterally out of the wing. It has been customary for several years to fix a single spiral spring to the wings of the nut by inserting the coil of such spring in grooves of such wings and fastening it therein by solder, and therefore I do not claim such, nor do I claim two spiral springs intertwisted, whereby the coils of one may be between those of the other, such spiral springs being at their opposite ends supported by or secured to suitable fixtures or supports, such being very old, as I believe.

What I claim as my invention is as follows, viz:

1. The wire spring as composed of the median straight portion, *a*, and the two spirals *b b'*, extended therefrom and arranged with each other substantially as represented.

2. The nut D, as having in each of its wings holes, as described, and the spring-coils extended into and through such holes, and where within such surrounded entirely by the metal or material of the wing, all being substantially as represented.

3. The piston-head B, provided with the tubular and slotted shank *e*, in combination with the

piston-rod screwed into the said shank, and with the spring A, as composed of the median portion, *a*, and the two spirals *b b'*, arranged therewith and with each other substantially as set forth, the said median portion, *a*, being arranged within and across the said shank, and all being substantially as described.

4. The spring constructed of the median portion and two spirals, and provided with the ball, all being substantially as represented.

5. The combination of the spring made and provided with the ball, substantially as described, with the piston head and rod connect-

ed and socketed to receive the ball, essentially as set forth.

6. The piston-head provided with the adjustable step or socketed screw *d*, in combination with the piston-rod C, socketed at its lower end, as described, and with the spring A, provided with the ball *c*, and composed of the median part, *a*, and the two spirals *b b'*, arranged as set forth.

GILMAN W. BROWN.

Witnesses:

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