2 Sheets—Sheet 1.

C. H. POND.

BELL-STRIKER FOR FIRE-ALARM TELEGRAPHS.

No. 188,183. Patented March 6, 1877.

Fig. 1.

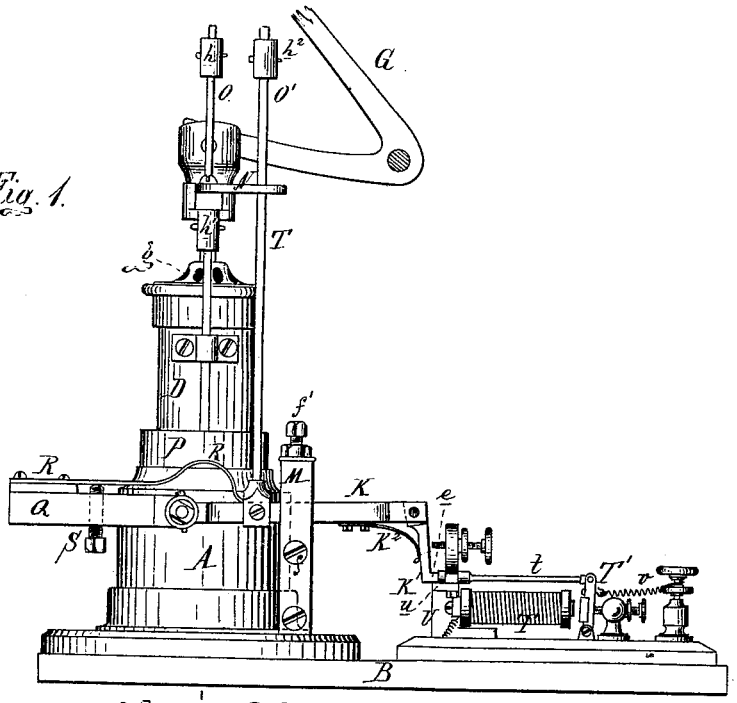


Fig. 2.

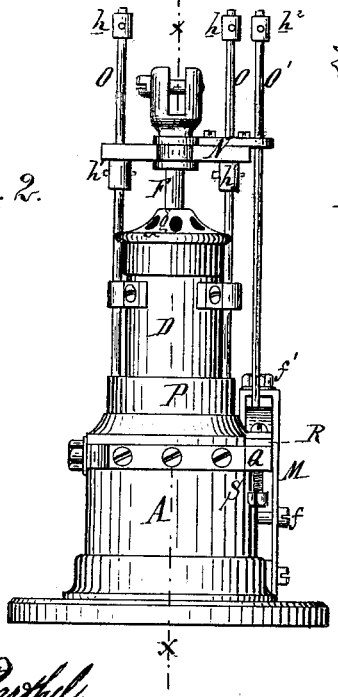


Fig. 3.

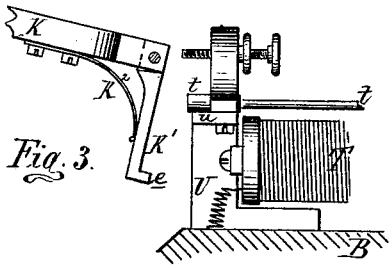
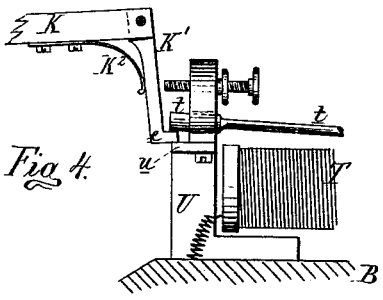


Fig. 4.



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2 Sheets—Sheet 2.

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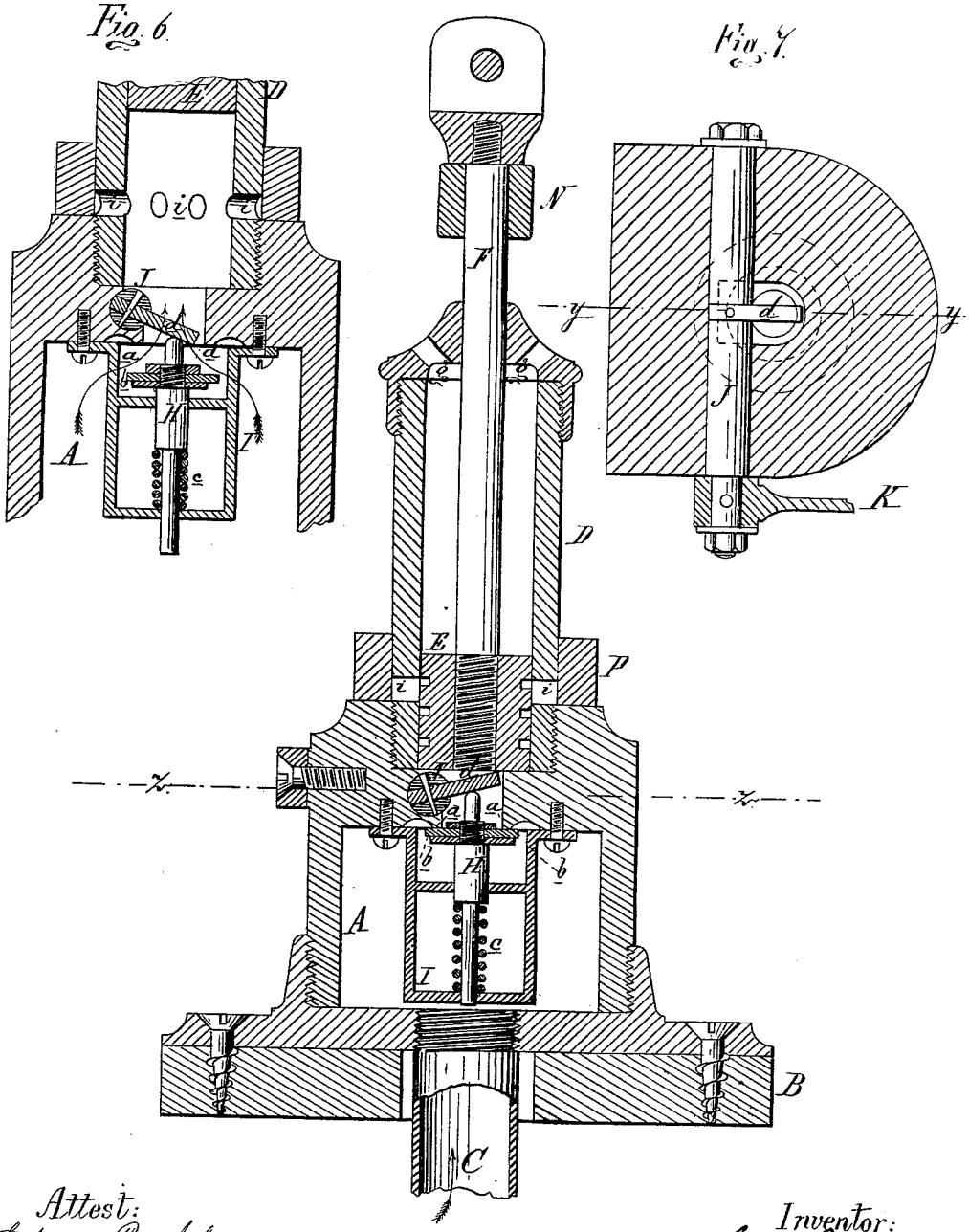
BELL-STRIKER FOR FIRE-ALARM TELEGRAPHS.

No. 188,183. Patented March 6, 1877.

Fig. 5



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UNITED STATES PATENT OFFICE.

CHESTER H. POND, OF DETROIT, ASSIGNOR TO THE MICHIGAN FIRE ALARM COMPANY, OF JACKSON, MICHIGAN.

IMPROVEMENT IN BELL-STRIKERS FOR FIRE-ALARM TELEGRAPHS.

Specification forming part of Letters Patent No. **188,183**, dated March 6, 1877; application filed January 4, 1877.

To all whom it may concern:

Be it known that I, CHESTER H. POND, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Bell-Strikers for Fire-Alarm Telegraphs, of which the following is a specification:

My invention relates, first, to the means for tripping the arm which opens the valve to the pneumatic engine; second, in the toe on the foot of the operating-arm for lifting the projecting end of the trip-rod when the local circuit is closed; and, further, in the combination of the principal parts for operating the valve of the pneumatic engine, all as more fully hereinafter explained.

Figure 1, Sheet 1, is a side elevation. Fig. 2 is an end elevation. Fig. 3 is a side elevation of portions of the tripping devices and valve-arm after the latter has been pushed off to open the engine-valve and have the piston rise to strike a blow on the bell. Fig. 4 is an elevation of the same parts, showing their relative positions when the valve-arm foot is caught up, while the local circuit is still closed. Fig. 5, Sheet 2, is an enlarged vertical section through the engine at *x x*. Fig. 6 is a partial transverse vertical section of the engine at *y y*, showing the valve opened to admit air under the piston. Fig. 7 is a horizontal section at *z z*.

In the drawing, A represents a valve-chamber, mounted on one end of a base-plate, B, and communicating, by a pipe, C, with a reservoir of compressed air, which may be located in the belfry, or in any other convenient place at a distance therefrom. D is a cylinder, mounted on the valve-chamber, and in it is fitted a piston, E, provided with a piston-rod, F, to which is pivoted one arm of a bent hammer-lever, G. Between the cylinder and the valve-chamber there is a port, at the lower end of which there is a projecting annular seat, *a*, against which an elastic disk-valve, *b*, seats itself by the pressure of the air. This valve is mounted on a stem, H, which is mounted and guided in a cage, I, suspended in the chamber, as shown. A spring, *c*, coiled spirally about the stem, assists in or accelerates the seating of the valve. The latter is secured on the upper part of the stem by a screw-nut, as shown, the head of the stem projecting above it. J is a rock-shaft, transversely journaled back of the port, with a finger, *d*, projecting across the port above the head of the valve-stem. K is an arm, keyed on the outer end of the rock-shaft, and to its extremity is pivoted a foot, K^1, having a slight movement on its pivot, and is pushed outward by a leaf-spring, K^2, under the arm. At the foot of the part K^1 there is an outwardly-turned toe, *e*. The arm plays in a vertical slot in a standard, M, in which there is a transverse pin, *f*, to limit its downward movement, and at the top there is a set-screw, *f'*, to limit its upward movement. When the arm is in or near the horizontal plane the finger *d* is above the valve-spindle, and the valve is free to seat itself; but when depressed the finger *d*, bearing upon the valve-stem, forces the valve away from its seat, which permits the air under pressure to pass through the port into the cylinder, and force up the piston, to actuate the hammer, the air above the piston escaping through the openings *g* in the cap of the cylinder. N is a cross-head on the piston-rod, through openings in which slide two tappet-rods, O O, one at each side of the cylinder, their lower ends being tapped into a ring-valve, P, fitted to the exterior of the cylinder, in the base of which there is a row of exhaust-ports, *i*, closed by the said ring-valve. Near the top of each rod O there is a tappet, *h*, and lower down another one, h^1. Just before the piston has completed an upward stroke the cross-head strikes the tappets *h h* and lifts the ring-valve high enough to disclose the ports *i*, to exhaust the cylinder, (the valve then being seated,) when the piston will descend, and just before completing its downstroke the cross-head will strike the tappets h^1 h^1, and move the ring-valve down to close the ports *i*. Behind, and in line with the arm K, a bracket, Q, is bolted to the side of the case, and on its outer end is bolted one end of a strong curved leaf-spring, R, whose free end impinges on and presses down said arm with force sufficient to open the valve against the pneumatic pressure upon its under side. A set-screw, S, is tapped up through the bracket, to impinge, if necessary, upon the under side of the spring R, to ease up its force upon the arm. O' is a tappet-rod, coupled to the arm K, beyond the

spring R, and extends up through one end of the cross-head N, and at its top there is a tappet, h^2, so placed thereon that said cross-head strikes it in the completion of the upward stroke of the piston, raising it far enough to draw up the arm K into its normal horizontal position. T is an electro-magnet, horizontally bolted to a standard, U, on the base, which standard has a hardened steel step or shoulder, *u*, on the back, upon which the toe *e* of the foot K^1 rests when the arm is raised to the horizontal position, and said foot is thrown forward by its spring K^2. The magnet T is in a local circuit that is open when the main-line circuit is closed, and closed when the current in the latter is interrupted. T′ is the armature-lever of said magnet, and to its top is pivoted a trip-rod, *t*, which passes through a vertical slot in the standard U, its free end resting on the step *u*, facing the toe *e*.

When the current in the main-line circuit is broken to give a signal, the local circuit is completed, the effect of which is to attract the armature to the magnet, which in turn causes the trip-rod to push the toe off the step. The spring R then forces down the arm, and opens the valve to admit air to the cylinder, which forces up the piston, causing the hammer to deliver a blow upon the bell. The area of the piston being greater than that of the valve, the latter is closed against the pressure of the spring R in the upward movement of the piston, the arm being drawn up until its toe *e* catches upon the step *u*, which supports the said arm in the horizontal position, while the air is exhausted from the cylinder, and the piston descends, as already described, ready for a repetition of the operation. If, as it may readily occur, the blow of the hammer may be delivered, and the arm be brought up again while the local circuit is still closed, with the trip-rod projecting from the face of the step, as seen in Fig. 3, the rod end will be caught and lifted up on the toe, as seen in Fig. 4, until the local circuit is broken, when the armature-spring *v* will retract the latter, whereupon the rod will drop to its position behind the toe, as seen in Fig. 1.

What I claim as my invention is—

1. In a bell-striker, the combination, with the pneumatic engine, of the lever K, having a movable foot, K^1, the step *u* on its standard U, and the trip-rod *t*, pivoted to its armature T′, substantially as and for the purposes set forth.

2. The toe *e* on the foot K^1, for lifting the projecting end of the trip-rod *t* from the step *u* when the local circuit is closed, substantially as described.

3. In a bell-striker, substantially as described, the combination, with the valve-chamber and cylinder of the pneumatic engine, of the spring-valve *b*, the rock-shaft J, and arm K, the said arm being operated in the manner set forth and shown.

CHESTER H. POND.

Witnesses:
H. S. SPRAGUE,
CHAS. J. HUNT.