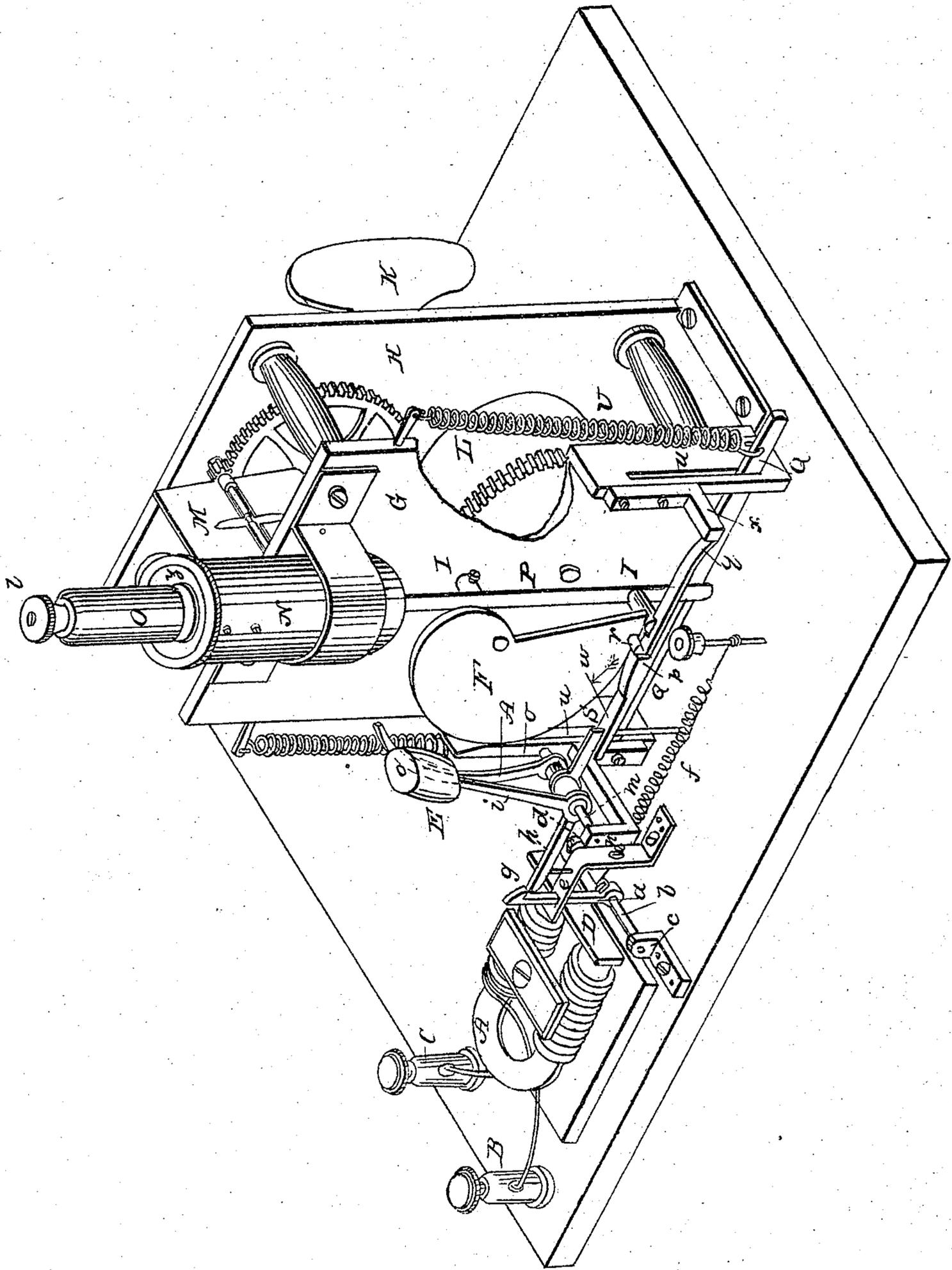


M. G. FARMER.
Electrical Alarm.

No. 23,883.

Patented May 3, 1859.



UNITED STATES PATENT OFFICE.

MOSES G. FARMER, OF SALEM, MASSACHUSETTS, ASSIGNOR TO WM. F. CHANNING.

IMPROVED MECHANISM FOR OPERATING STEAM OR AIR SIGNAL-WHISTLES BY ELECTRO-MAGNETISM.

Specification forming part of Letters Patent No. 23,883, dated May 3, 1859.

To all whom it may concern:

Be it known that I, MOSES G. FARMER, of Salem, in the county of Essex and State of Massachusetts, have invented a new and useful Apparatus called an "Electro-Telegraphic Air or Steam Whistle," more particularly applicable to the purposes of a fire-alarm telegraph, of which the following is a specification.

The nature of my invention consists in the application of what I call an "electro-magnetic escapement" to a suitable mechanism operating a condensing air-pump, by which a current of condensed air is forced through an air-whistle, organ-tube, or other wind-instrument, for the purpose of giving an alarm at a distance through the agency of the electric telegraph.

To enable others skilled in the art to understand any use my invention, I will proceed to describe the manner in which I have carried it out, reference being had to the accompanying drawing, in which the figure is a perspective view.

By an "electro-magnetic escapement" I mean an electro-magnet or its equivalent which, by its armature motion or any equivalent motion, directly or indirectly releases machinery, so that it moves through a prescribed space, which movement ends by restoring the armature and intermediate releasing apparatus, if there is any, to its original place.

The electro-magnetic escapement represented in said drawing is the same essential device described in Letters Patent of the United States which were granted me on the 4th of May, 1852.

A is an electro-magnet, whose terminal wires are attached to the screw-cups B C.

D is an armature attached to an armature-lever, *a*, which is affixed to a rocker-shaft, *b*, supported by the standards *c d*.

e is a guide limiting the motion of the armature-lever, and *f* an adjustable spring, drawing the armature back from the magnet when the magnet is not charged.

g is a latch on the top of the armature-lever, which catches the horizontal lever *h* of the system consisting of the weighted arm *E i* of the curved-arm *k* and the lever *l*, all of which are firmly attached to the rocker-shaft *m*, which is pivoted at *n o*. The lever *l* is directly above, though separated a short distance from, the tail *w* of the detent *p*, which is supported by and

attached to the spring *q*, affixed to the arm *x* of the plate R.

F is a snail, tending to revolve in the direction of its arrow by its connection with the clock-work or machinery, partially seen between the plates G H through the shaft I. The revolution of the snail F is resisted by the pin *r*, which catches in the detent *p*. The curved arm *k* is placed in the same plane with the snail F, and in such a position that when the weighted arm *E i* falls forward, carrying its system of levers with it, the curved arm *k* rests upon the periphery of the snail F. The machinery propelling the snail F may be actuated by a spring, by a weight, or by a water-engine, or any other known source of mechanical power.

In the drawing, K is the handle by which the mainspring in the barrel L is wound up. A part of other wheels and pinions is seen, which are geared together so as to be actuated by the spring in the barrel L and regulated by the fly M, and which communicate motion at proper times through the shaft I to the snail F.

N is a condensing air-pump, at the top of which is a circular slot, *s s s*, for the escape of the condensed air, and immediately above it is the edge of the hollow cap O, of the same diameter as the slot, the slot and cap being in the relative positions proper in steam or air whistles. The cap O is supported on a rod in the center, to which it is nipped by the milled screw-nut *t*.

In place of an air-whistle, a reed trumpet, such as is used in organs or other wind-instrument, may be substituted.

P is the piston-rod, carrying a piston within the cylinder N. Said cylinder is open at bottom, and has no valves. The piston-rod P is attached at the bottom to a cross-bar, Q, moving in the slots *u u*, cut in the guiding-plates R S.

T is a roller on the piston-rod P, so placed as to be traversed by the periphery of the snail F, and to be held down at its extreme point of depression by the end *v* of the snail when the pin *r* catches in the detent *p*.

U V are two springs attached to the ends of the bar Q, carrying the piston-rod P upward when not resisted by the snail F bearing on the roller T.

Operation: When the screw-cups B C are connected with the poles or extremities of an

electro-telegraphic circuit and a momentary current of electricity is sent over such circuit, the electro-magnet A becomes charged and attracts the armature D, which withdraws the latch *g* from the lever *h*, allowing the weighted arm *E i* to fall, carrying its system of levers with it. The lever *l*, in falling, strikes down the tail *w* of the detent *p*, leaving the snail F free to revolve in the direction of its arrow. As soon as the end *v* of the snail F has left the roller T the piston-rod P flies up by the reaction of the springs U V on the bar Q and condenses the air in the cylinder N, which escapes with the production of sound through the slot *s* of the air-whistle above; but the further revolution of the snail F brings it at once in contact with the roller T in its new position, and by its reaction on the roller T forces the piston-rod P and bar Q back into their original positions against the tension of the springs U V. The snail F also at the same time, or during a part of the same revolution, reacts against the curved arm *k*, carrying it back with its associated system, including the weighted arm *E i*, lever *l*, and lever *h*. The magnet A having lost its momentary magnetism and restored its armature D to the tension of the spring *f*, the arm *h* catches in the latch *g*. The detent *p*, no longer held down by the lever *l* resting on the tail *w*, is raised by the spring *q* and catches the pin *r* when the snail F has made a complete revolution. The parts are all therefore restored to their original position, the uncoiling of the mainspring excepted, and one shriek has been given by the air-whistle O. By sending successive electric currents of short duration to the magnet A successive shrieks may be given by such air-whistle engine, to indicate at a distance the locality of a fire, according to any system of signaling which may be agreed upon, or to communicate a signal or alarm for any other purpose.

In place of the reactive springs U V, it may be advisable, when the machinery is large, to substitute heavy weights or any other known mechanical force as an equivalent.

A reservoir for condensed air may be introduced between the cylinder N and the air-whistle above. In this case a valve is made to open into such reservoir from the cylinder N, which will prevent the air condensed into the reservoir by the piston of said cylinder from returning when the piston is withdrawn, and a valve is also made to open into the cylinder N at *s* from the external air to supply the vacuum produced by the withdrawal of the piston as above. An air valve or cock is also introduced between such reservoir and the whistle, which is opened by a long lever attached to said air-valve, which lever is usually held down by a spring, and which is momentarily raised and the air-valve opened by the pressure of the end *v* of the snail F when nearly at the end of its revolution, as above. I do not recommend this arrangement, but I wish thus to describe the application of an electro-magnetic escapement to an air-valve liberating air condensed within a reservoir and directing it to an air-whistle or its equivalent.

The electro-magnetic escapement, with the snail and clock-work annexed, may be used also to open, by the mechanism just described, the valve of a steam-whistle connected with a boiler or apparatus for producing high-pressure steam, or with any reservoir of condensed gas or vapor.

In lieu of employing an electro-magnet and its armature for the purpose of actuating the escapement, a bar of iron or magnet moving axially or by deflection within a coil may be used; and in place of an air or steam whistle a reed trumpet or other instrument may be employed.

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

The combination of an electro-magnetic escapement with the mechanism herein described, for operating a steam or air-whistle, as set forth.

MOSES G. FARMER.

Witnesses:

THOS. R. ROACH,
P. E. TESCHEMACHER.