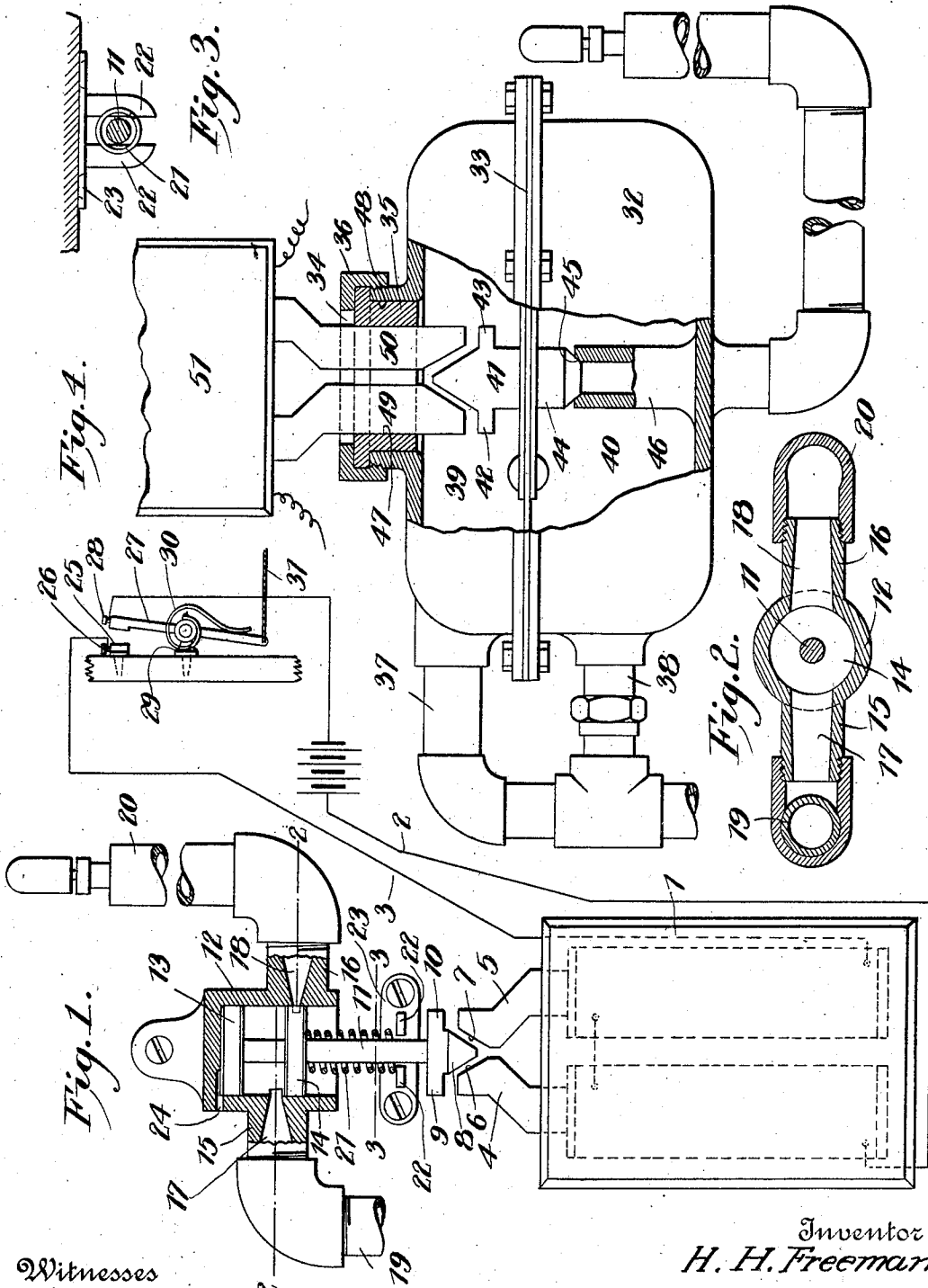


H. H. FREEMAN.
ELECTROMAGNETIC MEANS FOR OPERATING AIR AND OTHER WHISTLES.
APPLICATION FILED AUG. 24, 1908.

937,590.

Patented Oct. 19, 1909.



Witnesses

M. Rodwell
C. A. Grubauer

Inventor
H. H. Freeman

By *A. B. Wilson & Co*
Attorneys

UNITED STATES PATENT OFFICE.

HERBERT H. FREEMAN, OF ST. PAUL, MINNESOTA.

ELECTROMAGNETIC MEANS FOR OPERATING AIR AND OTHER WHISTLES.

937,590.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed August 24, 1908. Serial No. 443,333.

To all whom it may concern:

Be it known that I, HERBERT H. FREEMAN, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Electromagnetic Means for Operating Air and other Whistles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electro-magnetic means for operating air and other whistles from a distant point.

One of the objects of the invention is the production of electro-magnetic means adapted to move a valve from its seat so as to open a normally closed steam or air port through which steam or air is allowed to flow for operating a whistle.

Another object of the invention is the production of electro-magnetic means adapted to be connected to valves of different types and arranged to operate said valves through a circuit controlled by a distant switch.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved valve operating mechanism, partly in section; Fig. 2 is a horizontal section taken on line 2—2 of Fig. 1; Fig. 3 is a horizontal section taken on lines 3—3 of Fig. 1; Fig. 4 is a side elevation partly in section showing the application of my invention to a diaphragm valve provided with two compartments.

Similar parts are referred to in the following description and indicated in all the views of the drawings by similar reference characters.

In the drawings I have illustrated the preferred embodiment of my invention and these drawings are arranged for illustrative purposes and accordingly not drawn to scale.

In the drawings, the numeral 1 designates an electro-magnet provided with the usual circuit wires 2 and 3. The magnet 1 is formed or provided with a pair of upstanding arms 4 and 5 which are spaced apart on the upper end of said magnet and formed with inwardly inclined edges 6 and 7 which

are adapted to contact with an armature 8. The armature 8 is formed with lateral extensions 9 and 10 and is mounted on a valve piston stem 11 which is arranged to extend upwardly through a valve cylinder or casing 12. The upper end of the valve rod or piston stem is provided with pistons 13 and 14 which are spaced apart on said rod or stem.

The cylinder 12 is provided or formed with lateral extensions 15 and 16 through which ports 17 and 18 extend. Each of the ports 17 and 18 are wider at their inner ends in horizontal cross section than at their outer ends and taper outwardly from their inner ends to their outer ends. The ports 17 and 18 communicate with a supply pipe 19 and a whistle pipe 20, respectively. Normally the piston 13 is held against the upper end of the cylinder 12 and the piston 14 held over the port 18 by means of a spring 21 which is mounted on the lower end of the piston rod 11, and adapted to bear against the lower end of the piston 14 and against lugs 22 formed on plate 23 and which engage the piston rod on opposite sides. The cylinder 12 is provided with an air vent 24 for permitting the pistons 13 and 14 to freely move in said cylinder.

The circuit wires 2 and 3 connected to electro-magnet 1 are arranged to be controlled by means of an operating switch comprising a contact block 25 having a suitable screw connecting post 26 and a lever arm 27 provided with similar connecting post 28. The lever 27 is pivotally supported upon a bracket arm 29 and normally held out of engagement with contact block 25 by means of a spring 30 which is adapted to bear with its outer end against one end of said lever and is connected at its inner end to the pivot of said lever. The lever 27 is connected to an operating cord 31 which may extend in any direction and is adapted to be operated manually. When the operating cord 31 is pulled, current will flow over wires 2 and 3 energizing magnet 1 and the armature 8 which, of course, being formed of steel or iron will be attracted by the upstanding legs of said magnet and piston 14 will open communication between ports 17 and 18, thereby allowing steam to pass from the supply pipe 19 to the whistle pipe 20. Should it be desired the electric current may be obtained from the train generator system if the train is provided with such a system. When it is

desired to cease the operation of the whistle, the cord 31 is released which operation will bring the lever 27 out of engagement with contact block 25 and by means of the spring 21 and a piston 14 close communication between ports 17 and 18, thereby stopping the whistle.

The application illustrated in Fig. 4 comprises the combination of an electro-magnetic means, comprising the essential part of my invention, with a diaphragm valve. In this figure, the numeral 32 designates a valve casing formed in two compartments and provided with a diaphragm 33 which is secured between said sections. The upper section of the casing 32 is formed with an opening 34 through which a gasket 35 extends and is secured against the casing 32 by means of a nut 36. The upper section of the casing communicates with a steam or air pipe 37 and the lower end of the casing 32 communicates with a similar pipe 38. The diaphragm 33 divides the casing 32 into two compartments 39 and 40 and a plug or armature 41 formed with lateral extensions 42 and 43 is secured to the upper side of the diaphragm 33 and a valve 44 is secured to the lower side of said diaphragm. The valve 44 is normally seated on a valve seat 45 formed in an eduction pipe 46 which extends downwardly through the lower section of the casing 32 and leads to the whistle by its own gravity and the weight of the plug 41. Normally the pressure in chambers 39 and 40 is substantially equal and when seated on its seat, valve 44 is adapted to close communication between pipe 38 and pipe 46. The gasket 35 is formed with openings 47 and 48 through which legs 49 and 50 having connections with an electro-magnet 51 extend. Electro-magnet 51 is connected by means of current carrying wires with the circuit closing lever switch 27 and when energized by the closing of the circuit will raise plug or armature 41 and valve 44 and thereby open communication between pipes 38 and 46, consequently, operating the whistle connected with pipe 46. The plug or armature 41 is formed with an outwardly tapering end which is adapted to contact with the terminals of legs 49 and 50. When the circuit is opened by releasing the operating cord, communication between pipes 38 and 46 will be closed by the pressure of the steam in chamber 30, weight of plug or armature 41 and valve 44 which causes said valve to instantly return to its seat 45.

My improved device can be applied to and it is especially designed for locomotives and railroad whistles but is also applicable to stationary whistles such as are commonly used in factories and similar institutions.

It is evident that my invention may be used in connection with any valve whether

said valve is arranged to control steam pressure or air pressure with detail modifications in the legs connected to the operating magnet and in the piston or movable valve ports.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention, as defined in the appended claims.

I claim as my invention:—

1. The combination with a valve casing divided into two compartments or chambers by a diaphragm, of means for supplying fluid under pressure to the chambers, a valve seat extending into one of the chambers, a valve secured to the diaphragm of the casing and adapted to engage with the valve seat, an armature secured to the diaphragm, an arm projecting into the remaining chamber adapted to engage with the armature whereby the valve may be removed from its seat, a magnet adapted to magnetize the arm, means for energizing the magnet, and means for controlling the energizing means.

2. In combination with a valve casing divided into two compartments, a diaphragm extending across the casing, means for supplying fluid under pressure to the compartments, the valve seat extending into one of the compartments, a valve secured to the diaphragm of the casing and adapted to engage the valve seat, an armature at the upper end of the valve and electro-magnetic means extending into the casing for attracting the armature to lift the valve from the seat.

3. The combination with a valve casing, a diaphragm secured inwardly to the casing and dividing the same into two compartments, means for supplying fluid under pressure to the compartments, a valve seat extending into one of the compartments, a valve movable with the diaphragm and adapted to be normally held on the valve seat by the weight of the valve and the pressure of the steam or fluid in the opposite compartment, an armature at the upper end of the valve and electro-magnetic means extending into the casing for attracting the armature to raise the valve from its seat.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HERBERT H. FREEMAN.

Witnesses:

ANNA PEDERSON,
LA VERNE M. FUNK.