

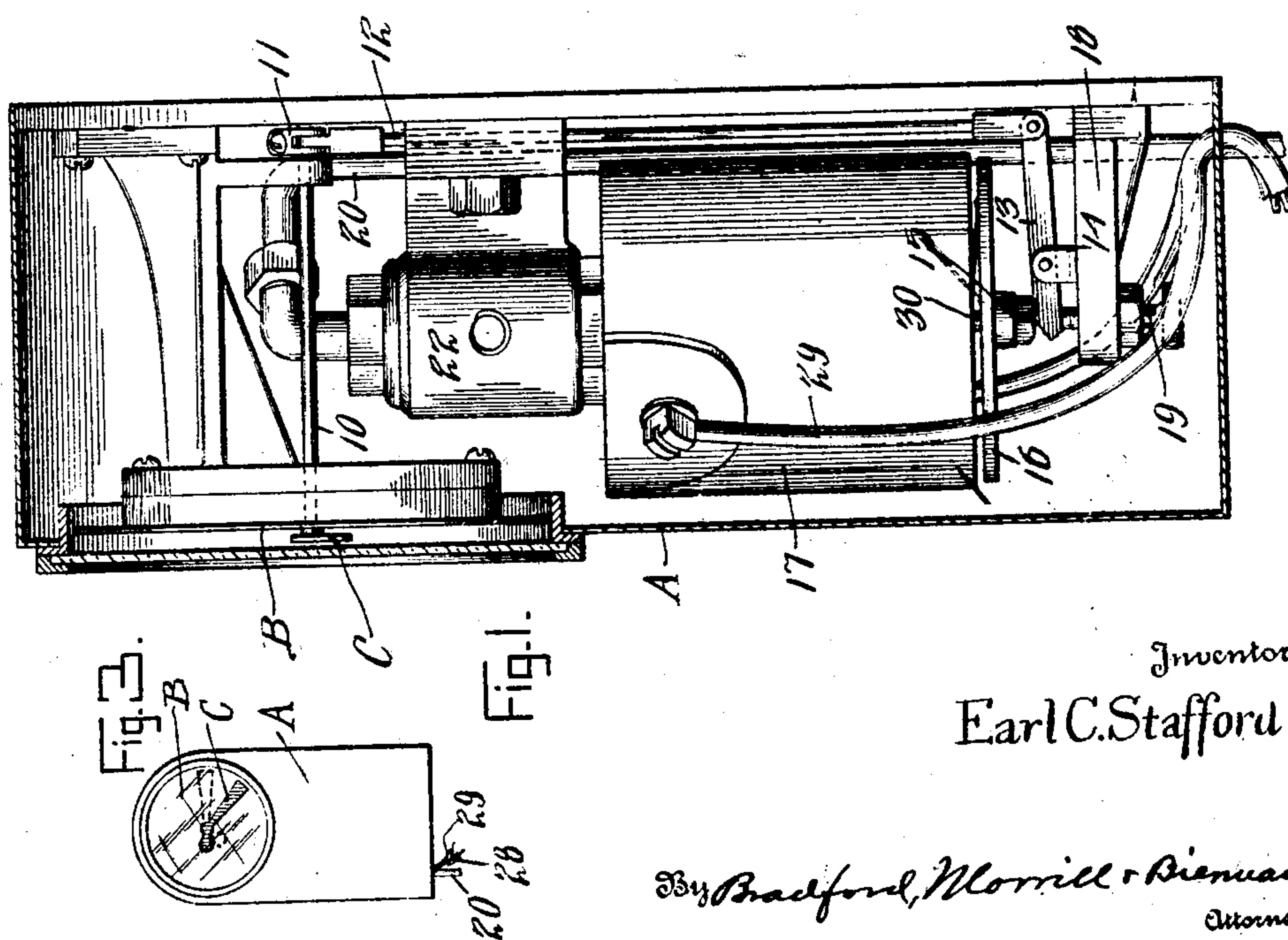
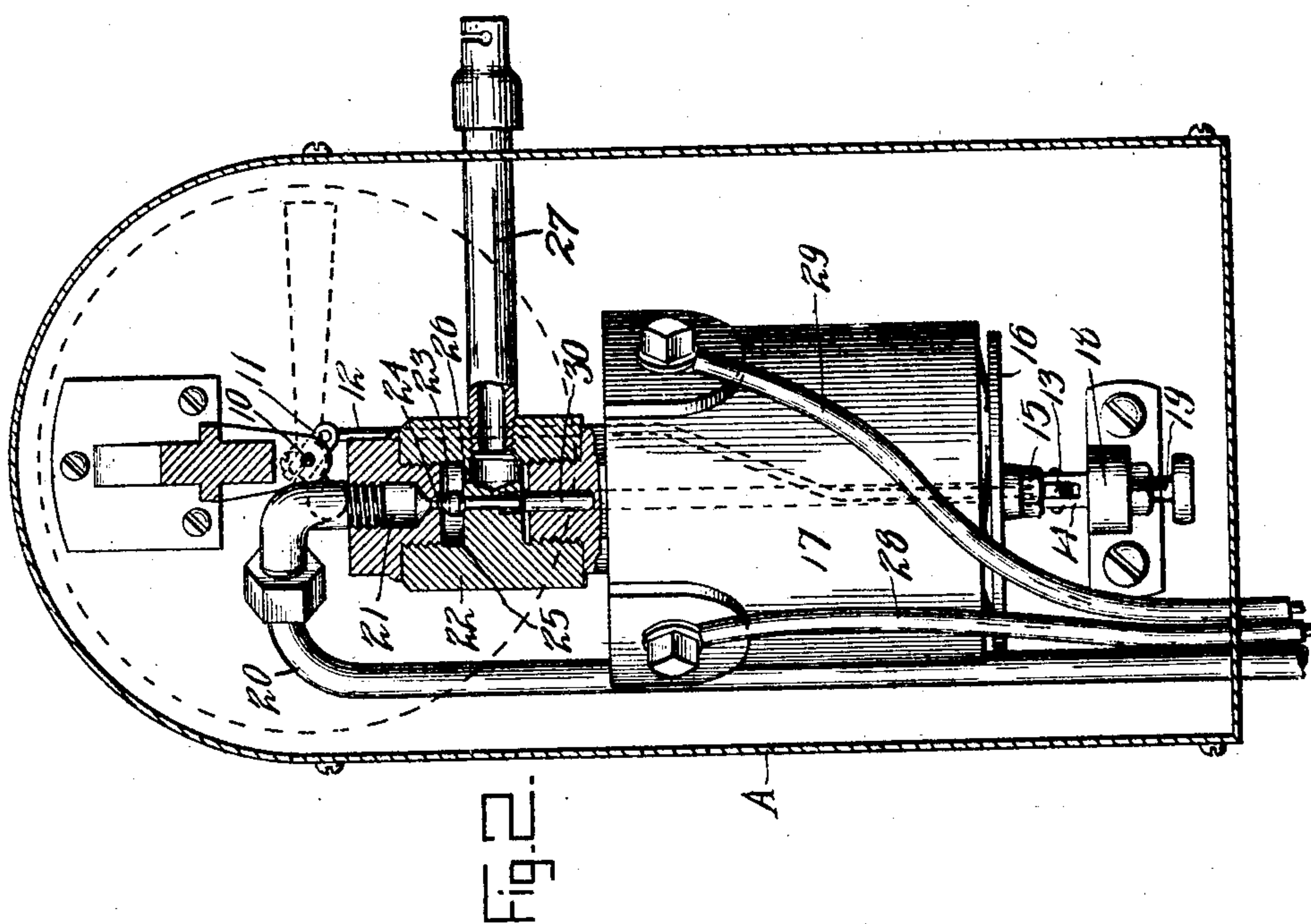
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SIGNAL BOX FOR TRAIN SIGNAL SYSTEMS

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UNITED STATES PATENT OFFICE.

EARL C. STAFFORD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE UNITED STATES TRAIN SIGNAL COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

SIGNAL BOX FOR TRAIN-SIGNAL SYSTEMS.

Application filed May 10, 1920. Serial No. 380,151.

My said invention relates to the details of construction of the signal box and apparatus forming a part of the apparatus shown and briefly described in application No. 380,286, filed concurrently herewith by William E. Benn and George E. Davies, and it consists in various novel features thereof as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts,

Figure 1 is a vertical section through the signal box, illustrating the apparatus therein in side elevation, and

Figure 2 a similar view through the signal box illustrating the apparatus therein partly in section and partly in front elevation.

In said drawings, the portions marked A represent the signal box casing, B the dial, and C the signal arm.

The casing, dial, and signal arm are of the form illustrated or any other form that may be found appropriate or desirable.

Said signal arm is mounted on an arbor 10 having a crank arm 11 thereon which is connected by means of a connecting rod 12 with a lever 13 pivoted in a bracket 14, its other end being positioned under the securing bolt 15 of an armature 16 of the magnet 17. Bracket 14 is mounted on an arm 18 in which is mounted a screw 19 adapted to come under the outer end of lever 13 to limit its downward movement.

A branch 20 of the air line leads to a chamber 21 in the top of a casing 22 in which is mounted a valve 23 adapted to fit a valve seat 24 around an aperture leading from the chamber 21 to another chamber 25. Said chamber 25 communicates by an aperture 26 with a pipe 27 on the outer end of which is mounted a signaling device, such as a whistle or "sisser" or other appropriate device.

The magnet 17 is connected in electric circuit by means of wires 28 and 29.

In operation, the electric circuit is normally closed and the armature 16 is in contact with the magnet, closing valve 26 and preventing air from passing from pipe 20 to pipe 27. The signal arm is also held in the position indicating "safety". When, for any reason, the electric circuit is broken, the

magnet becomes de-energized, the armature 16 falls, operating through the lever 13, rod 12, and crank arm 11, to rotate the arbor 10 and turn the signal arm to the position of "danger". At the same time valve 23 falls, air rushes from pipe 20 through the ports before indicated to pipe 27 and operates the signal at the end of said pipe.

Both an audible signal and a visible signal are thus provided operable immediately on the breaking of the electric circuit for any cause. When the circuit is closed and the magnet again energized, armature 16 is drawn upward, carrying with it plunger 30 which strikes the end of the valve stem and closes the valve against its valve seat with a hammerlike action.

The weight of arm C, operating through its connections with lever 13, nearly balances the weight of armature 16 so that comparatively little electrical energy is required to close the valve 24. The air pressure is likewise practically equalized on both sides of said valve so that no power is required to overcome air pressure in the operation of closing the valves. The downward movement of the armature stem carries it slightly further than the drop of the valve stem so that the upward start of the armature is made free of the weight of the valve. By reason of these features but little electrical energy is required and a very sensitively operating valve is provided.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is—

1. In a signaling device, an electromagnet, an armature, a plunger rigid with the armature vertically slidable through the coil of the electromagnet, an audible signal operable by a compressed fluid, a valve supported by the upper end of the plunger when closed, said valve controlling the fluid supply to the signal, a visible signal, means for operating the signal including a rod connected thereto, a lever supporting the armature at one end and connected at the other to said rod, the parts being substantially balanced so as to require a minimum of electrical energy for operating them, substantially as set forth.

2. A signaling device comprising a casing, a stationary electromagnet in the casing, means for supporting the electromagnet, said supporting means containing a cham-

ber and air passages connected thereto, an audible signal connected to one of said passages, means for supplying air under pressure to the chamber through the other of
5 said passages, a valve in the chamber to close the last named passage, a plunger to operate said valve, an armature on said plunger actuated by said electromagnet, a lever operated by said electromagnet when
10 deenergized, a link attached to said lever, a

rock shaft connected to the other end of the link, and a visible signal on the rock-shaft adapted to be operated when the audible signal is operated, substantially as set forth.

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In witness whereof, I have hereunto set my hand at Washington, District of Columbia this fifth day of April, A. D. nineteen hundred and twenty.

EARL C. STAFFORD.