

G. H. BLISS.  
 Signaling Apparatus for Telephone-Lines.  
 No. 225,327.      Patented Mar. 9, 1880.

Fig:1.

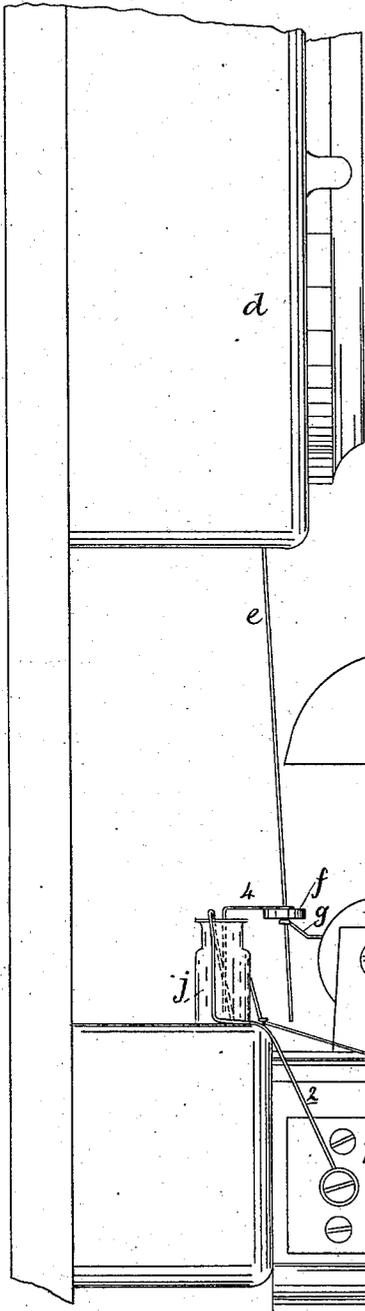


Fig:3.

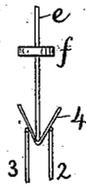
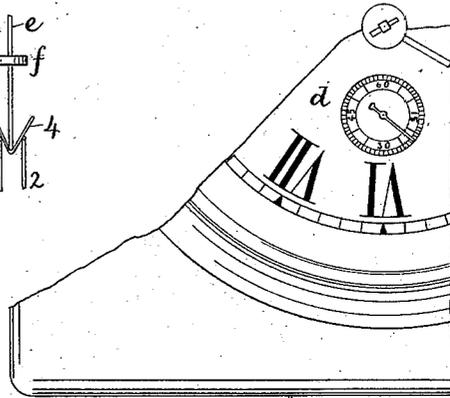


Fig:2.



Witnesses.  
 S. F. Lyman.  
 Jos. P. Livermore.

Inventor.  
 George H. Bliss.  
 by Corvus Gregory  
 Atty.

# UNITED STATES PATENT OFFICE.

GEORGE H. BLISS, OF PITTSFIELD, MASSACHUSETTS.

## SIGNALING APPARATUS FOR TELEPHONE-LINES.

SPECIFICATION forming part of Letters Patent No. 225,327, dated March 9, 1880.

Application filed January 12, 1880.

*To all whom it may concern :*

Be it known that I, GEORGE H. BLISS, of Pittsfield, county of Berkshire, State of Massachusetts, have invented an Improvement in Telephone Call-Signals, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to a call-signal for telephones, and is intended to be used in connection with the telephone call-signal invented by me, for which United States Letters Patent No. 223,469, dated January 13, 1880, were granted, to which reference may be had.

In the system of call-signals now in general use all the call-signals in the circuit are operated when desired to give a signal to any one, such a system requiring a sufficient strength of battery to operate all the electro-magnets for the different signals in the circuit, besides overcoming the resistance of the line itself.

In my previous invention referred to the call-signals were rendered inoperative except at certain intervals of time, the said intervals being different for each signal, so that only one could be operated at a time, they being rendered inoperative mechanically by a device controlled by a clock or time-train.

As described in said patent, the electric current was passed through the electro-magnets of all the signals; but inasmuch as only one signal could be operated at a time the strength of battery needed to overcome the resistance of the other electro-magnets was unnecessary.

In my present invention I provide means to shunt the circuit around the electro-magnet of each signal while the said signal is inoperative, and consequently the battery-power required is only enough to operate a single electro-magnet in the circuit, all the others being shunted. Each signal is rendered operative in its turn, the shunt around its electro-magnet being broken, and then at the proper moment the shunt is closed and that of the next signal in order broken.

It is obvious that merely shunting their electro-magnets is sufficient to render the signals inoperative; but in such case each bell would give a tap when its shunt was broken, to obviate which I also make use of the same means to render the bell-hammer inoperative as in my former patent.

In the present embodiment of my invention I use, in connection with the weight operated by a time-train to hold or release the bell-hammer, as described in the patent referred to, a circuit-closer to connect the open ends of the shunt, the said circuit-closer being lowered to form such connection at the same time and by the same rod that applies the weight to hold the bell-hammer against the bell.

Figure 1 is a side elevation of a telephone call-signal provided with my invention; Fig. 2, a front view of a portion thereof, the parts in front of the circuit-closing device being removed to show it more clearly; and Fig. 3, a modification of the circuit-closer.

The signal-bell *a*, its operating electro-magnet *b*, and the stand *c* for holding them, provided with the usual switches and points for connecting the various wires, are of any usual construction; and the time-train (shown as a clock) *d*, the link *e*, actuated by the said clock, and the weight *f*, carried by said link, and adapted, when resting on the arm *g*, connected with the armature which operates the hammer of the bell *a*, to prevent the said hammer from falling back from the bell when the electro-magnet *b* is demagnetized, are all substantially as in my former patent hereinbefore referred to.

The binding-screws *h i* upon the frame *c*, to which the main signal-circuit wire is connected, and between which the coils of the electro-magnet *b* are interposed, are respectively connected with the shunt-wires 2 3, which dip into mercury contained in the cups *j k*. It is obvious that when electrical connection is established between the ends of the wires 2 3 or between the mercury in the cups *j k* the electro-magnet *b* will be shunted and its resistance removed from the main signal-circuit, so that the strength of battery required is correspondingly reduced.

The circuit-closer used to establish connection between the wires 2 3 is shown as a forked wire, 4, having its ends in the cups *j k*, and carried by the link *e* in such manner that when said link is in its lowest position the ends of the said wire 4 dip in the mercury in the said cups, thereby completing the shunt around the electro-magnet *b*.

It is obvious that any other device may be

used to complete the shunt—as, for example, that shown in Fig. 3, where the wire 4 is V-shaped and forms direct electric connection between the wires 2 3, which are bent into convenient form to engage the said wire, being provided with straight or curved horizontal portions, between which the wire 4 rests; or the circuit-closer may be a rotary one, carried by an independent portion of the clock-work from that actuating the link *c* and weight *f*.

It is evident that the signal may be operated, in accordance with the principle of my former patent, by the shunt and circuit-closer alone, independent of the weight *f*; but in that case the bell-hammer would fall back when the shunt was closed, and then give a tap when it was again broken.

It is to be understood that the different signals in the circuit are operated at different periods of time, and at any one time all the electro-magnets *b* of the signals in the circuit are shunted but one.

I claim—

1. A clock or time-train, a signal-bell and electro-magnet to operate it in a main electric circuit, and a shunt-circuit to shunt said electro-magnet, one portion of said shunt-circuit being composed of a circuit-closer controlled by the said time-train, whereby the said electro-magnet is shunted during certain in-

tervals of time without opening the said main circuit, substantially as described.

2. In a telephonic circuit, a series of clocks or time-trains and signal-bells operated by electro-magnets; combined with a series of circuit-closing devices to close a shunt around the said electro-magnets, each one operated by the said time-trains to open the shunt and cause the current to pass through the coils of the corresponding electro-magnet at a different time from any of the others, whereby all the electro-magnets in the circuit may be operated each in turn by a battery of sufficient power to operate one, substantially as described.

3. In a telephone signal apparatus, a time-train or clock, a signal-bell and hammer operated by an electro-magnet and its armature, combined with a circuit-closing device to close a shunt around the said electro-magnet and an armature-controlling device to prevent the armature from falling back when its magnet is shunted, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE HENRY BLISS.

Witnesses:

DANIEL STEARNS,  
JAMES M. BARKER.