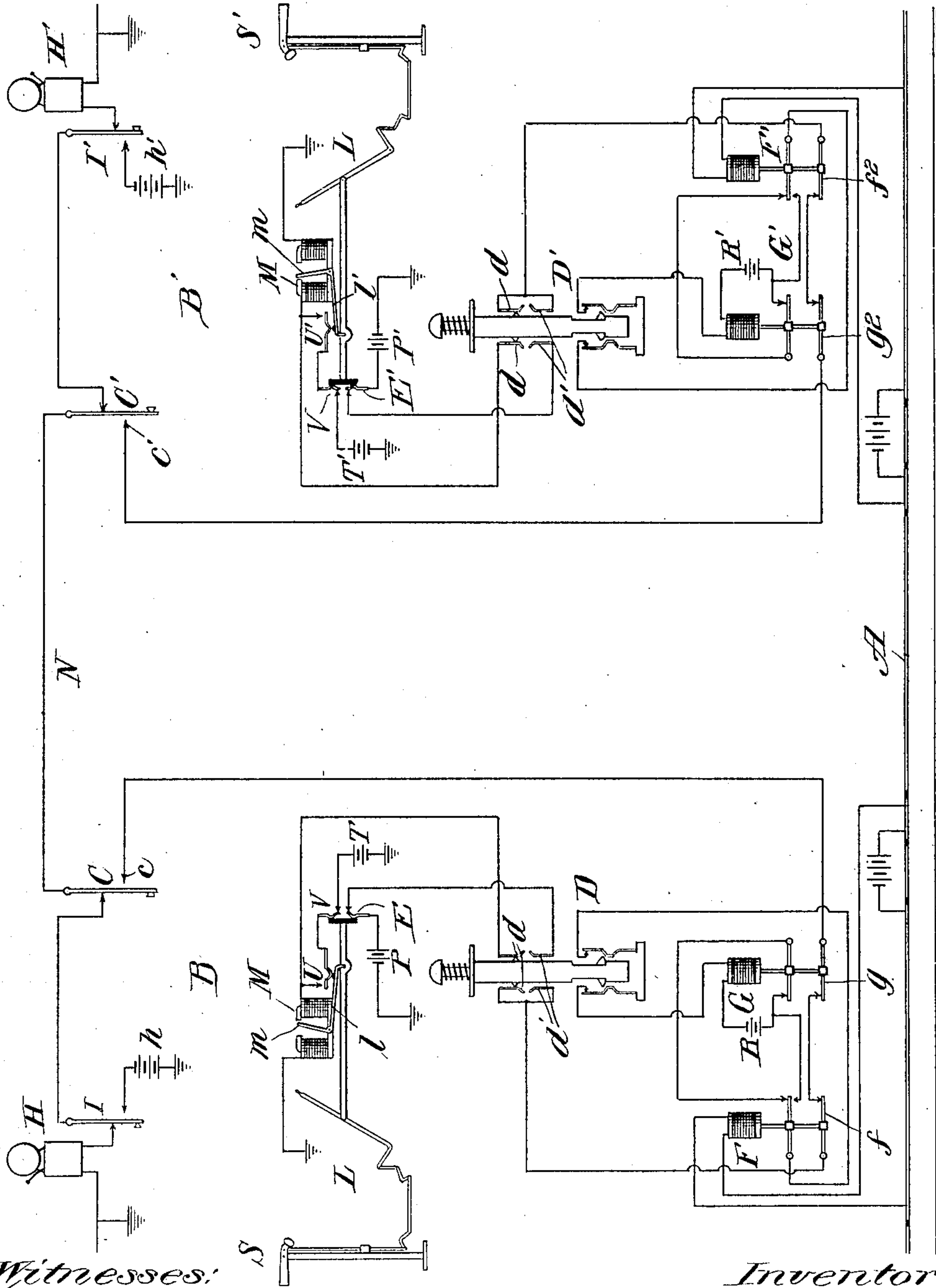


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PATENTED MAR. 17, 1908.

W. DAVES.
BLOCK SIGNAL SYSTEM.
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UNITED STATES PATENT OFFICE.

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BLOCK-SIGNAL SYSTEM.

No. 882,143.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed December 23, 1907. Serial No. 407,799.

To all whom it may concern:

Be it known that WILLIAM DAVES, citizen of the United States, residing at Bloomington, county of McLean, State of Illinois, has
5 invented a certain new and useful Improvement in Block-Signal Systems; and declare the following to be a full, clear, and exact description of the same, such as will enable
10 others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to controlled manual block signals and has for its object to improve their effectiveness as safeguards and
15 the convenience of operation thereof.

In one of its aspects my invention contemplates the provision of means for reducing the danger of releasing a signal lock under improper conditions, particularly where
20 there is but a single wire extending between stations. To this end the lock-controlling magnet is polarized, and all batteries for energizing auxiliary devices, such as bells,
25 telegraphic instruments or the like, whose current may by chance come upon the governing circuit for the magnet, are grounded in such a manner that the magnet cannot be
30 operatively energized thereby.

In a further aspect my invention may be considered as comprising an arrangement which will permit an operator to throw a signal lever after it has been unlocked, even
35 though the actuating circuit for the lock may not have been maintained a sufficient length of time for this purpose; as, for example, where the operator at one station does not hold the circuit-breaker closed until the signal has been set at the controlled station.

My invention will be more fully understood and its various objects and advantages will be more clearly apparent from the following detailed description taken in connection with
40 the accompanying drawing which indicates diagrammatically a single block of a system embodying my invention.

For convenience the system illustrated in the drawing is substantially that disclosed in my Patent No. 869,555, granted on the
50 29th day of October, 1907. Thus A indicates one block of a single track railway, and B

and B' represent the stations at the ends of the block.

S and S' are semaphores at said stations, these being of the normal danger type. 55

L and L' are the operating levers for the semaphores and l and l' are respectively the locks for said levers. At the station B is a double throw switch C, a circuit breaker D, and a single throw switch E. 60

At the station B' are switches C', D' and E' corresponding to the switches C, D, and E at the other station. At the station B is a track relay F and also a stick relay G. Similar relays F' and G' are located at the other 65 station.

H and H' are signal devices such as bells at the respective stations.

N is a single conductor extending between stations. 70

In the arrangement of my previous patent it is possible, when an operator at one station is ringing the bell at the other station, to manipulate the switches at the latter station so as to release the local lock. In order to prevent this I make use of polarized magnets for controlling the locks of the several operating levers so that they will be operative only when current is flowing through the magnets in the proper direction. Then to prevent 80 the current which is energizing the bells, the telegraphic instruments, or other auxiliary translating devices, from operatively energizing the lock magnets, I provide these auxiliary translating devices with separate batteries indicated at h and h' respectively. 85 Because there is but a single wire between stations one terminal of each of the batteries which is adapted to exercise control between stations must be connected to the wire N and the other terminal to ground. I therefore connect corresponding terminals of all of the batteries for actuating auxiliary devices to the wire N, and the same set of terminals of the batteries P and P' which act to energize the 95 lock magnets, to ground. Each lock is illustrated as comprising a double magnet M having an armature m to which the lock proper is secured. The magnet may be polarized by providing definite polarity to the armature as, for example by making the armature a permanent magnet. Any suitable means 100

for making the magnet polarized may be employed, however.

When the operator at station B wishes to set his signal at clear he presses the button I and causes the bell H' at station B' to give the desired indication to the operator at the latter station; the operator at the station B' then actuates the switch C' so as to make contact at c' and also pushes down the circuit breaker D'; the operator at station B then actuates the switch C so as to make contact at c. Current will now flow from ground through the actuating coils of the locking magnet at station B, through the upper contact d of the circuit breaker at this station, through the contact f of the track relay, through the contact g of the stick relay, through switch C, through wire N, through switch C' at station B', through the contact g² of the stick relay at the latter station, through the contact f² of the track relay, through the contact d' of the circuit breaker, thence through switch E', battery P' to ground. As long as the operator at station B' holds the circuit breaker closed and the switch C' in position to make contact at c', the operator at station B is free to throw the signal lever; but should the operator at the station B' release the switch C' or the circuit breaker before the lever can be thrown then, in the arrangement shown in my prior patent the lever at the station B would again be locked.

In accordance with one feature of my invention I provide means whereby, after one of the levers has been unlocked it will be kept unlocked even though the operator at the other station release the circuit breaker or the double throw switch. To this end I provide batteries T and T' which are ground in the same manner as the batteries P and P' and arrange switches U and U' which are actuated by the armatures of the locking magnets so as to complete a maintaining circuit for the magnets through the switches T and T' after the magnets have been energized in the manner previously described. I also provide switches V and V' similar to the switches E and E' so that as soon as a lever is operated it will break not only the actuating circuit for the locking magnet associated with the other lever but also its own maintaining circuit. The batteries P and P' and T and T' have their corresponding terminals grounded so that current will flow from these batteries through the actuating coils of the locking magnets in the same direction.

An instance of an improper current which would effect an unlocking of a signal lever provided with an unpolarized locking magnet occurs when the operator at one of the stations, say station B', presses the bell lever I' with the intention of sounding the bell at

the other station, when the operator at the latter station hears his bell ringing he can operate the double throw switch C and cause a current to flow from battery h through switches I' and C', through wire N, through switch C, through relay contacts g and f, through circuit breaker contact d, and thence through the coils of the locking magnet at station B to ground. By polarizing the locking magnets the effect of such an improper current is nullified, however, and even though the operator attempts to unlock his lever wrongfully he is unable to do so.

While I have described in detail preferred forms of my invention as embodied in a particular signal system, it will of course be understood that I do not desire to be limited to the use of my invention in such system or to the particular forms illustrated and described, the scope of my invention being clearly shown by the definitions thereof which constitute the appended claims.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a signal system, a signal lever, a lock therefor, a magnet for actuating said lock, means associated with said lock for completing a maintaining circuit for said magnet, and an actuating circuit for said magnet.

2. In a signal system, a signal lever, an electromagnetic lock therefor, an actuating circuit for said lock, and means associated with said lock for completing a maintaining circuit therefor.

3. In a signal system, a signal lever, an electromagnetic lock therefor, a lock-actuating circuit, means associated with said lock for completing a maintaining circuit therefor, and means associated with said lever for interrupting said maintaining circuit upon operation of the lever.

4. In a signal system, a signal lever, a polarized magnetic lock therefor, an actuating circuit for said lock, an auxiliary translating device, an actuating circuit for said translating device including a portion of the actuating circuit for the lock, and independent sources of current supply for said circuits connected thereto in such a manner that the current from said sources flows in opposite directions through the portion which said circuits have in common with each other.

5. In a block signal system, a signal lever, an electromagnetic lock therefor, an actuating circuit for said lock, a maintaining circuit for said lock, an auxiliary translating device, an actuating circuit for said translating device, said actuating circuits having a portion in common, and sources of current supply connected to said circuits in such a manner that current in the actuating and maintaining circuits for the lock flows in the same di-

rection while the current in the lock-actuating circuit and the translating-device-actuating circuit flow in opposite directions through said common portion.

- 5 6. In a signal system, a signal, a polarized electromagnetic lock therefor, and a controlling circuit for said lock.

In testimony whereof, I sign this specification in the presence of two witnesses.

WILLIAM DAVES.

Witnesses:

WM. F. FREUDENREICH,
HARRY S. GAITHER.