(No Model.)

D. H. RICE.

ELECTRIC CALL BELL.

No. 446,712. Patented Feb. 17, 1891.

Fig. 1

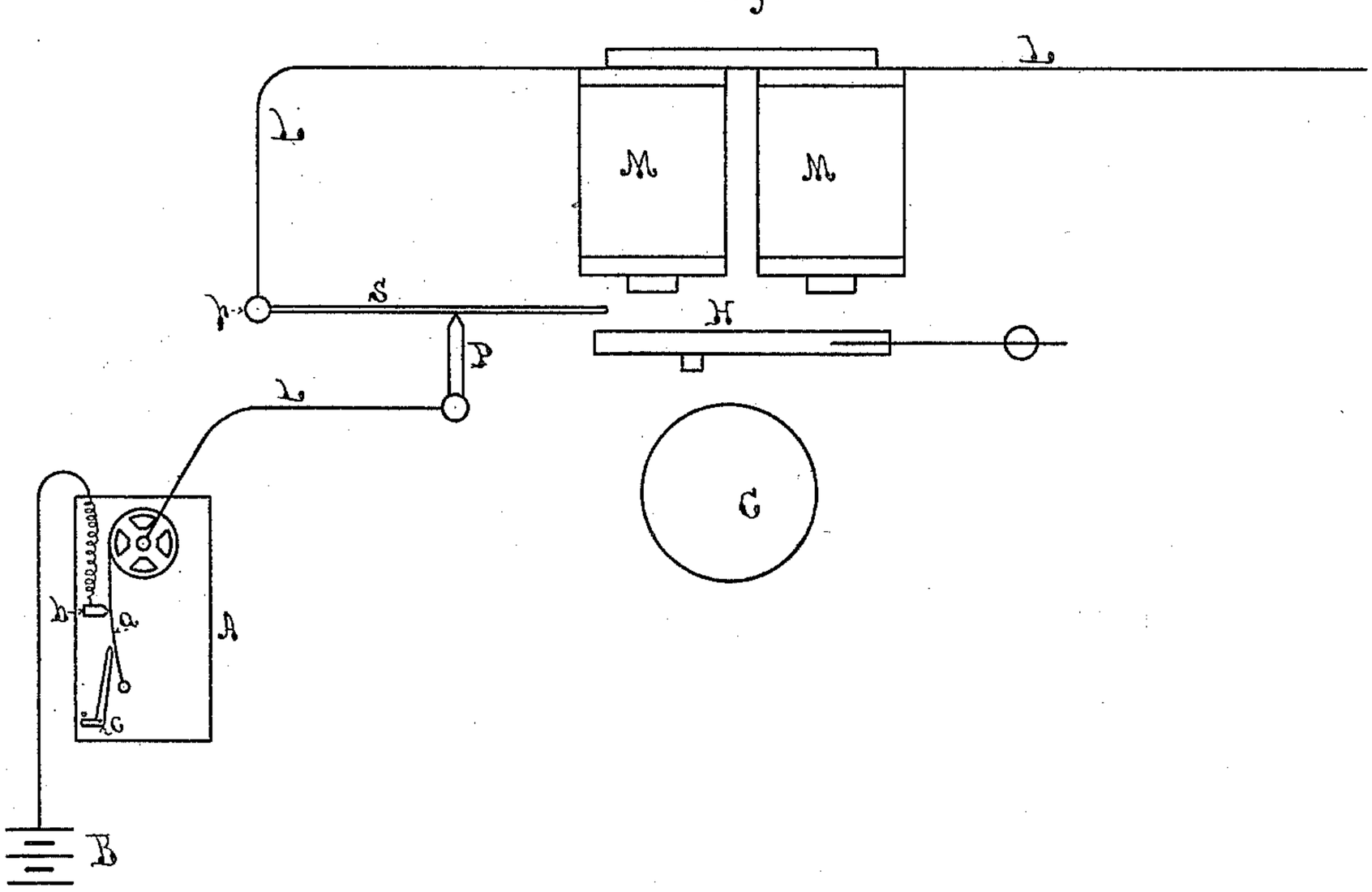
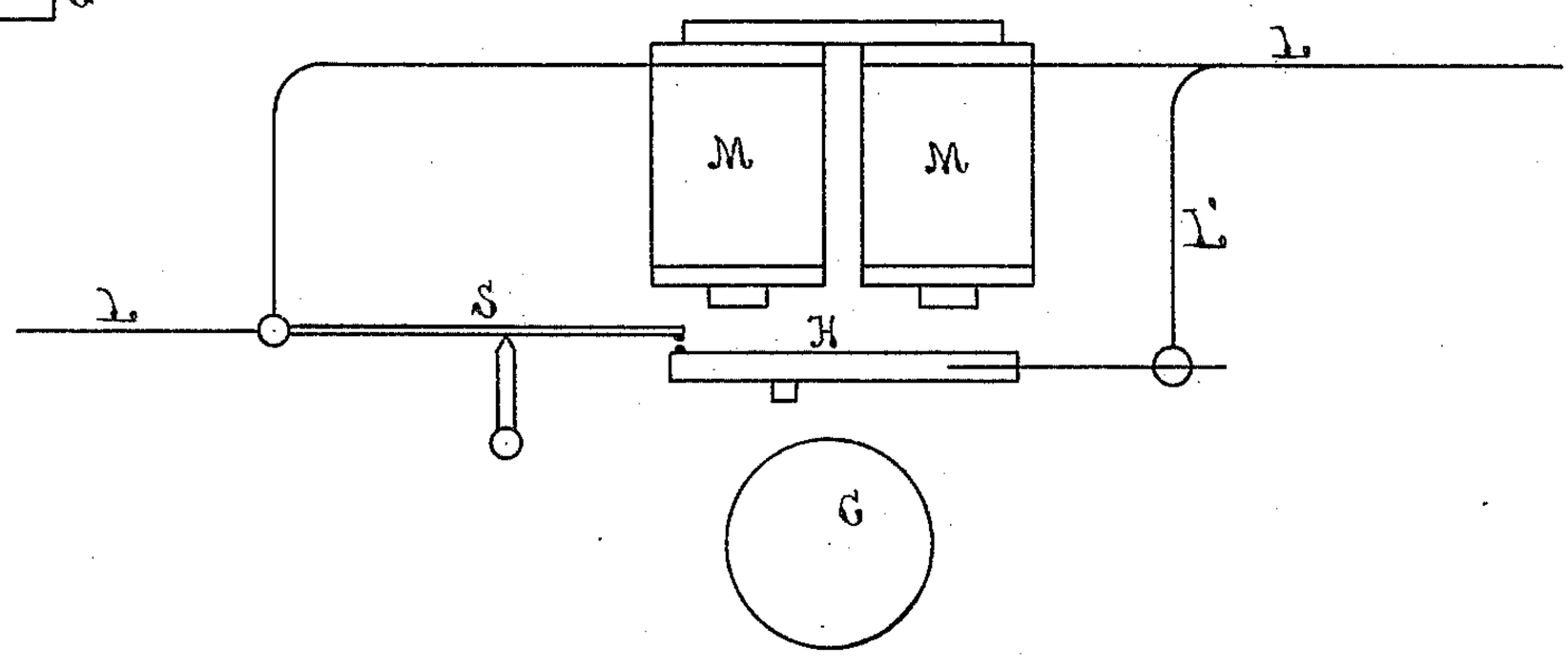


Fig. 2



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DAVID HALL RICE, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE CURRIER TELEPHONE BELL COMPANY, OF MASSACHUSETTS.

ELECTRIC CALL-BELL.

SPECIFICATION forming part of Letters Patent No. 446,712, dated February 17, 1891.

Application filed November 16, 1881. Serial No. 45,956. (No model.)

To all whom it may concern:

Be it known that I, DAVID HALL RICE, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Electric Call-Bells, of which the following is a specification.

My invention relates to the electric call-bell invented by Jacob B. Currier and shown in his patent, No. 246,374, dated August 30, 1881; and it consists in applying to said Currier bell an automatic circuit-breaking device working in the time of the vibration of the hammer of the bell, and so adjusted as only to be set in action when the bell-hammer has reached its amplitude of vibration, whereby I am enabled, after the bell has once been set to ringing by the calling device, to make it ring itself indefinitely without reference to the caller until it is stopped by breaking the circuit elsewhere, as hereinafter described.

In the drawings, Figure 1 shows a part of a circuit with the caller at the calling-station and one of the subscriber's stations having a Currier bell provided with my improvement. Fig. 2 shows a modification of my invention.

A is the Currier calling device at the central office, which is so well known as not to require an elaborate description. Its circuit-breaker *a* is held away from contact with its tangent-point *b* by the lever *c;* but when the lever is withdrawn in the usual manner to permit the circuit-breaker to vibrate it will form an electrical contact with the tangent-point *b*, not only intermittently while vibrating, but also constant when at rest and until pushed aside by the lever *c* again.

B is the battery.

G is the ground-connection, and the circuit is also grounded at the other end beyond the farthest subscriber's station in the usual manner.

C is the Currier bell at a subscriber's station. H is its hammer, and M is its magnet, all arranged in the usual manner, so that the bell shall be rung by a vibrating or intermittent current through the bell-magnet synchronous with the movements of the hammer. When such a current is sent by the circuit-breaker *a* over the line L, the hammer H constantly increases the amplitude of its vibrations until it reaches and strikes the bell C. Just within reach of the longer vibrations of the hammer I place a long slender spring S, fixed in a post *p* and resting in electrical contact with the point of a metal block P when at rest, as shown, but capable of being lifted from the block when struck by the hammer H, so as to break the contact. The line L is carried from the calling-station to the block P. Thence the electric current passes through the spring S and its post *p*. From thence the line is continued to the magnet, and from the latter continues on to the next station.

The mechanism operates as follows: The circuit-breaker is set to the required length to produce an intermittent current synchronous with the hammer H, and is set in vibration, sending the current over the line and through the magnet M, thus causing the hammer to reach and strike its bell. When it rebounds from the bell and is drawn toward the magnet, it reaches and strikes the spring S, thus breaking the current at P, and it continues to do so at each vibration, and thus forms a broken current in its own time, which continues to ring the bell after the circuit-breaker *a* has ceased to vibrate and until the circuit is broken by the lever *c* being brought against the circuit-breaker and removing it from its contact-point *b*.

The advantage of my improvement is that the bell can be sounded for an indefinite time by once setting the caller in motion, which is of great advantage. For instance, suppose the hammer H vibrates about fourteen hundred times per minute. The circuit-breaker *a* will have to be shortened so much that it will sound the bell ordinarily but a few seconds with once withdrawing the lever *c*, while with my improvement when the bell once commences to sound it will continue to do so until stopped.

It is obvious that different forms of arrangement of the spring S and block P may be adopted, or that a lever pivoted at *p* may be used in place of the spring S without departing from the spirit of my invention, the novel feature of which consists in applying to this kind of a bell an automatic mechanism operated in the time of the hammer, after the latter has been set in motion by a vibrative or broken current, to produce an intermittent

current through the magnet. The spring S may, instead of causing the current to cease flowing through the magnet, be made to short-circuit it around the magnet, and thus produce a broken or undulatory current through the latter, as shown in Fig. 2. In this case the line L is carried directly to the spring S, and when the hammer H touches the spring it flows through the hammer H and the line L′ to the main circuit L, or it may be sent directly to the ground instead of onto the main line again. Contact-points of platinum are applied to the hammer and spring.

What I claim as new and of my invention is—

1. In combination with the hammer H, cooperating with means which vibrate it by a broken or undulatory current sent from a distant station on the line, and its magnet, an automatic mechanism operated by the hammer and producing a broken or vibratory electric current through the magnet, substantially as described.

2. In combination with the circuit-breaker *a*, the hammer H, the magnet M, and the spring S, substantially as described.

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