No. 840,508. PATENTED JAN. 8, 1907.

T. W. McKENZIE.

TELEGRAPHIC APPARATUS.

APPLICATION FILED JAN. 15, 1906.

Fig. 1.

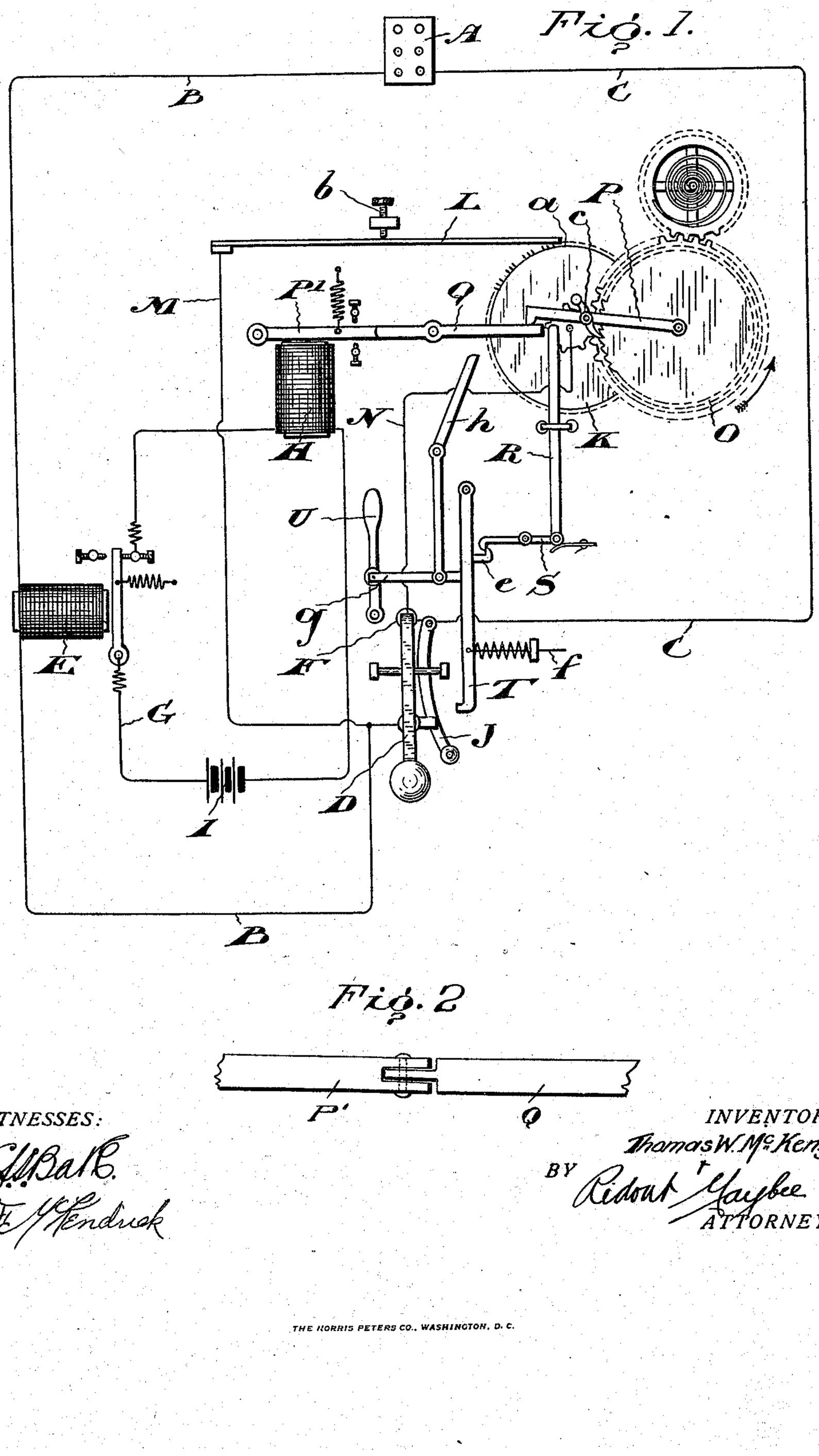

Fig. 2.

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TELEGRAPHIC APPARATUS.

No. 840,508. Specification of Letters Patent. Patented Jan. 8, 1907.

Application filed January 15, 1906. Serial No. 296,085.

To all whom it may concern:

Be it known that I, THOMAS WILLIAM McKENZIE, of Kenton, Manitoba, Canada, have invented certain new and useful Improvements in Telegraphic Apparatus, of which the following is a specification.

My object is to devise automatic means to enable an operator to call any other office on his line and means whereby the office called or any other office can break in on the operator calling and throw his automatic caller out of action; and my invention consists, essentially, of an automatic caller placed in a loop-circuit, means for switching the loop-circuit into the main-line circuit, and means operated by the opening of the main-line circuit for cutting out the caller, substantially as hereinafter more specifically described and then definitely claimed.

Figure 1 is a diagrammatical view of my apparatus. Fig. 2 is a detail view showing the connection between the vibrating bar and the sounder-bar.

In the drawings like letters of reference indicate corresponding parts in the different figures.

In the drawings, A is the switchboard, with which are connected the wires B and C, which when the apparatus is in use form part of the main-line circuit. The wire B connects with the front contact or anvil of the key D and includes in its circuit a relay E. The wire C is connected with the back-stop F of the key. The relay, as in the ordinary Morse telegraph system, makes and breaks the contacts in the circuit G, which includes the sounder H. This sounder-circuit is of course provided with its local battery I. The key D is of the ordinary Morse type and is provided with a switch J, adapted to make contact between the front contact and the back-stop when the key is open, which is of course its normal condition.

All the matter described is that commonly employed in Morse telegraph systems, and is therefore well understood by those skilled in the art. My invention lies in adapting an automatic caller to this system and providing means for throwing the caller out of action when the office called or any other office on the main line desires to break in.

The caller comprises a wheel K, driven, as indicated, by a suitable train of clockwork. This wheel has on its periphery contact-points *a*, adapted to make an electrical contact with the point of the spring L. A wire M connects the spring L with the front contact of the key, and a wire N electrically connects the wheel K with the back-stop of the key.

The spring L may be brought into engagement with the contacts *a* by means of a set-screw *b*. If now the switch J be opened, a current flowing in the main line must necessarily pass through the loop-circuit containing the caller, and if the wheel K be in motion the call indicated by the contacts on its surface will be sent through the main line and continue to be sent through the main line as long as the wheel is in motion or until the loop-circuit is cut out. It is evident when the switch is closed that the extra resistance afforded by the loop will prevent a current flowing through it. The caller then may be thrown into or out of the main circuit by operating the switch J, but it is also necessary to provide means whereby the office called or any other may break in or answer the call. For this purpose I provide a wheel O, suitably driven by clockwork, preferably that employed to drive the wheel K, as shown. On the axle of this wheel is journaled an arm P, carrying a gravity-dog *c*, which tends to maintain its point in contact with the periphery of the wheel O. The periphery of this wheel is provided with ratchet-teeth, as shown, these teeth being so directed that as the wheel rotates in the direction indicated by arrow they slip by the point of the dog *c*.

The outer end of the arm P rests upon the vibrating bar Q, suitably fulcrumed, preferably near its connection with the bar P of the sounder H. This connection may be any that will permit of the sounder-bar transmitting its vibrations to the vibrating bar Q. I show the end of the sounder-bar forked to receive the end of the vibrating bar. Owing to the position of this fulcrum, the end of the vibrating bar under the end of the arm P possesses a greater range of movement than the end connected to the bar of the sounder.

Under the arm P is suitably supported a rod R, connected to the one end of the pivoted detent S, which engages a catch *e*, formed on the switch push-bar T. This push-bar is located and shaped to engage the switch J and is normally pushed forward to keep the switch closed by means of the spring *f*. Under ordinary conditions when the message is being sent the bar of the sounder is never up longer than the fifth part

of a second, and of course when the line is closed it is kept down.

The arm P, being engaged with the periphery of the wheel O, tends to fall as the latter revolves; but the speed of the wheel O will be such that the bar cannot fall far enough to operate the detent S during the fifth part of a second that the sounder ordinarily lowers the outer end of the vibrating bar Q. If, however, an operator desiring to break in opens the line for more than the fifth part of a second, the end of the vibrating bar Q will stay down long enough to permit the arm P to fall low enough to contact with the rod R, and thus release the detent S, causing the push-bar T to move forward under the impulse of its spring and close the switch J, thus cutting out the loop-circuit of the caller and permitting the party breaking in to answer the call or to make a call himself. It is desirable at the same time to stop the rotation of the wheels K and O and to provide means for resetting the device. I therefore provide a pivoted lever U, to which is pivoted a link *g*, which is adapted to contact with the switch push-bar T. This link is also pivoted to the lower end of the lever *h*, the upper end of which is adapted to engage the periphery of the wheel K, and thus stop it.

From the arrangement of the parts it is evident that when the switch push-bar T is operated by its spring to close the switch J it will also contact with the link *g* and cause the lever *h* to stop the rotation of the wheel K, and consequently of the wheel O.

When the operator desires to throw his caller into the main circuit, he moves the lever U over to the position shown in the drawings, thus releasing the wheel K and engaging the catch *e* with the detent S. The detent and catch are beveled, as shown, to permit of this engagement. Now as soon as the operator opens the switch J the sounder is thrown into the main circuit and calling commences and continues until some other operator breaks in in the manner described.

It will be of course an understood matter with all operators that when they desire to break in they must open the line and hold it open for more than a fifth part of a second. It will be understood also that I do not desire to limit myself to the exact constructions shown, as these may be varied widely without departing from the spirit of my invention.

When the line is in use, the spring L will be withdrawn from the wheel K, so that the circuit may be made and broken through the key D. In practice as many wheels K will be provided as there are offices to be called.

What I claim as my invention is—

1. In telegraphic apparatus the combination of a main-line circuit normally energized and provided with transmitting and receiving apparatus; an automatic caller; normally controlled means for sending the signals of the caller through the whole length of the main line, and means controlled by the opening of the main-line circuit for more than a predetermined time for stopping the signals of the caller until again manually started, substantially as described.

2. In telegraphic apparatus the combination of a main-line circuit; a loop-circuit; an automatic caller in the said loop-circuit; a switch by means of which the loop may be switched into and out of the main-line circuit; and means controlled by the opening of the main-line circuit for cutting out the loop-circuit, substantially as described.

3. In telegraphic apparatus the combination of a main-line circuit normally energized and provided with transmitting and receiving apparatus; a loop-circuit; an automatic caller in the said loop-circuit; a switch by means of which the loop may be switched into and out of the main-line circuit; and means controlled by the opening of the main-line circuit for stopping the signaling of the caller until manually restarted, substantially as described.

4. In telegraphic apparatus the combination of a main-line circuit; a loop-circuit; an automatic caller in the said loop-circuit; a switch by means of which the loop may be switched into and out of the main-line circuit; and means controlled by the opening of the main-line circuit for cutting out the loop-circuit and for stopping the caller, substantially as described.

5. In telegraphic apparatus the combination of a main-line circuit provided with a plurality of sets of transmitting and receiving apparatus; an automatic caller; means for sending the signals of the caller through the main-line circuit; and means controlled from any station in the main-line circuit for stopping the transmission of caller-signals until manually restarted, substantially as described.

Kenton, Manitoba, December 23, 1905.

THOMAS WILLIAM McKENZIE.

In presence of—
H. McLEAN,
F. G. ARTHUR.