L. G. WOOLLEY.

SIGNAL APPARATUS.

APPLICATION FILED AUG. 31, 1906.

905,266. Patented Dec. 1, 1908.

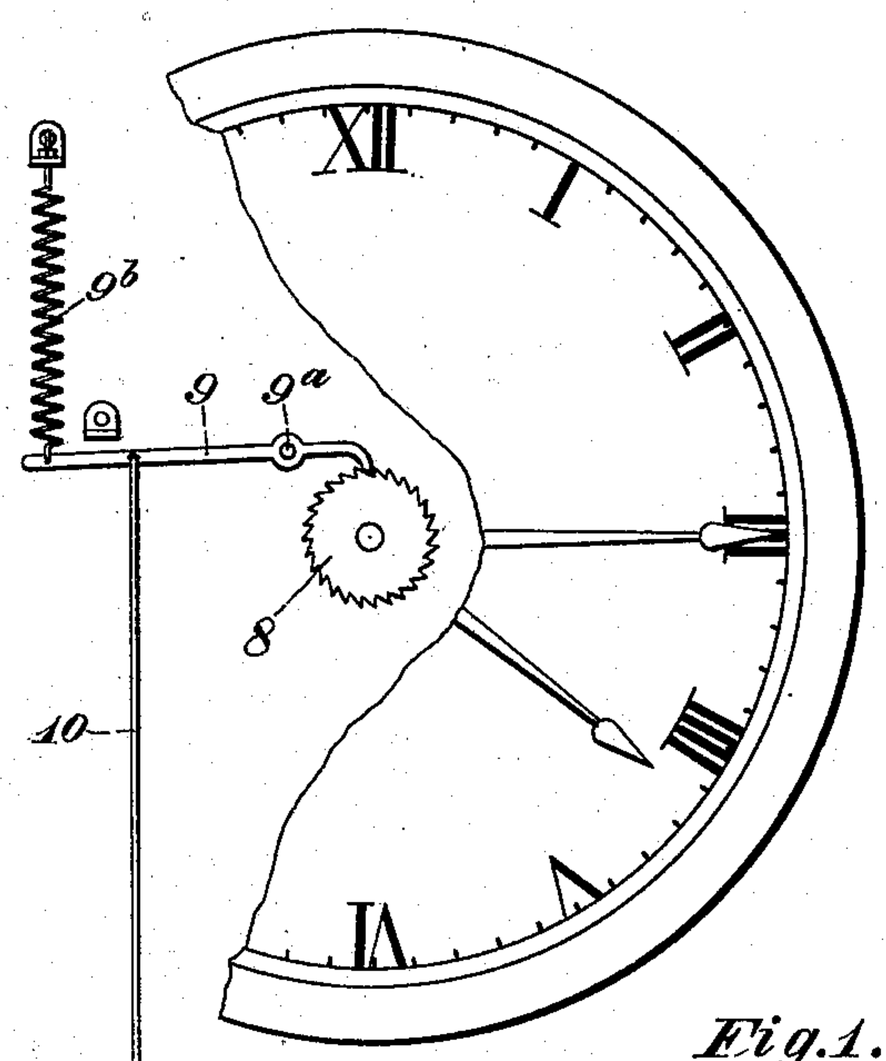

Fig. 1.

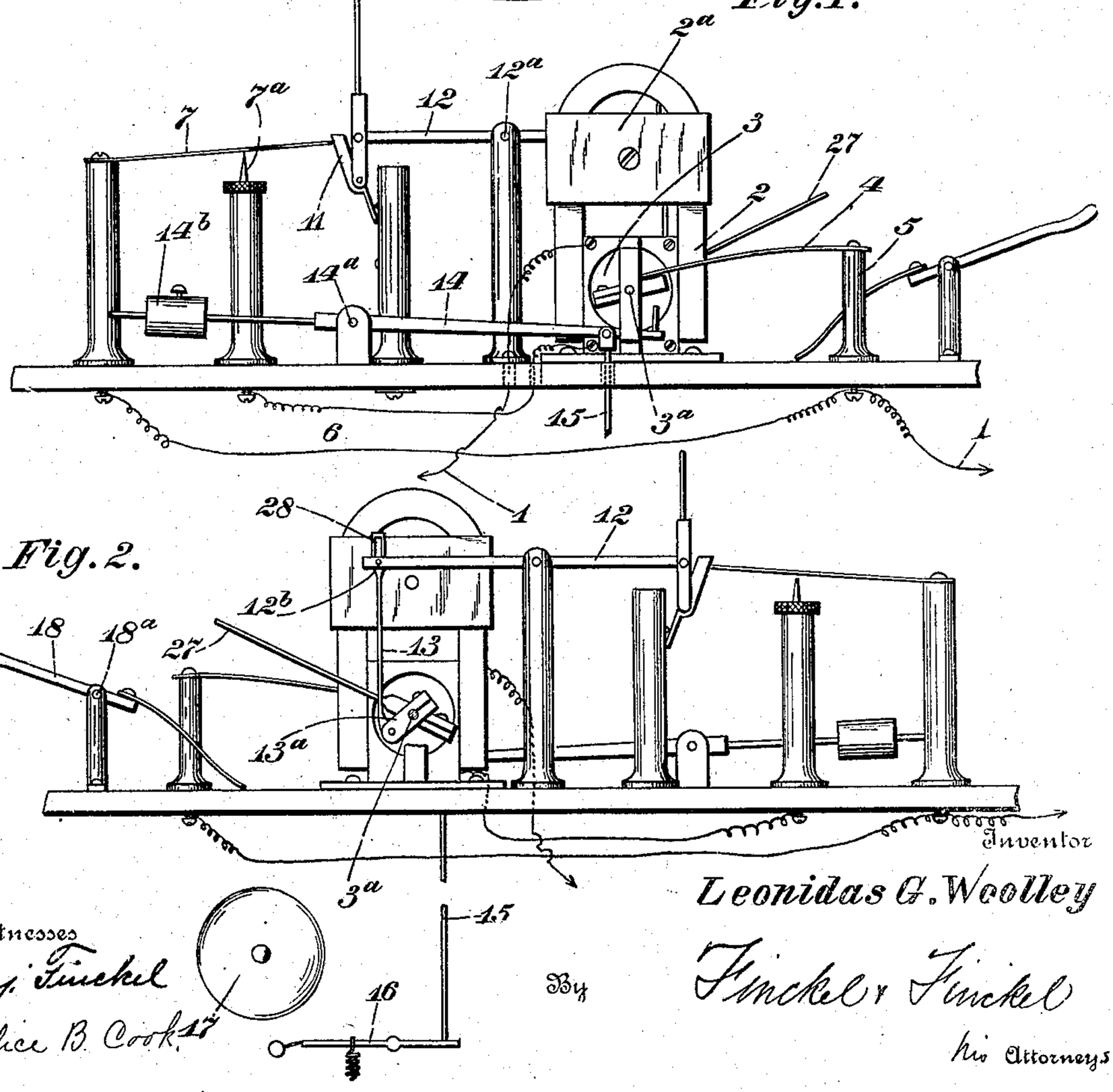

Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

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SIGNAL APPARATUS.

No. 905,266. Specification of Letters Patent. Patented Dec. 1, 1908.

Application filed August 31, 1906. Serial No. 332,800.

To all whom it may concern:

Be it known that I, LEONIDAS G. WOOLLEY, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented a certain new and useful Improvement in Signal Apparatus, of which the following is a specification.

More especially the invention relates to the class of mechanism shown in my Letters Patent of the United States No. 664,802, dated December 25, 1900.

One of the principal objects of this invention is to provide an improved and simplified apparatus for automatically testing at frequent intervals a signaling system, especially a municipal signaling system, and to automatically audibly or visually indicate a fault occurring in the system.

Another principal object is to provide improved means for electro-magnetically giving an audible or visual alarm or signal at an engine-house or station.

Other objects will appear from the following description and claims, the invention not being confined in its embodiment and application to precisely the examples shown.

In the accompanying drawings—Figure 1 is a front elevation, with parts broken out and omitted, of an apparatus for testing the line of the system; Fig. 2 is a rear view of the lower portion of the apparatus shown in Fig. 1, but also showing a bell to announce the existence of a fault in the line.

In the views the characters 1, 1, designate conductors of the main line, which line contains suitable apparatus for transmitting signals, as for example, fire alarms. Interposed in the main line is a magneto-electric device comprising a permanent magnet 2, and a wound armature 3. The armature rocks on a shaft 3^a and the circuit of the coil is closed through said shaft, a finger 4 and post 5. But normally the main circuit includes a shunt circuit 6 which in turn includes a make-and-break device comprising, in the present instance, a spring finger 7 and a contact point 7^a therefor. The circuit through the coil of the magneto-electric device is of greater resistance than the circuit through the shunt 6 and the ordinary position of the armature is the position of equilibrium established by the magnetic attraction of the permanent magnet and substantially that indicated in Figs. 1 and 2.

Secured preferably on the shaft of the minute hand of a clock is a toothed wheel 8, and riding on the teeth of said wheel is one end of a lever 9. This lever 9 is pivoted at 9^a, and is furnished at its other end with a spring 9^b that promptly raises said end when the opposite end drops between two teeth of the wheel. Connected with the outer portion of the lever 9 is a rod 10 that carries at its lower end a pivoted dog 11, the upper end of which, on the quick up-stroke of the rod 10, lifts and passes the end of the spring finger 7, thus momentarily breaking the contact of said finger 7 with the point 7^a.

Attached to the lower end of the rod 10 is one end of a lever 12 pivoted at 12^a and having at its other end a pin 12^b. The pin 12^b is adapted to engage the slotted upper end 28 of a rod 13 that is hingedly attached to a small crank arm 13^a fixed on the shaft of the armature coil. During the momentary separation of the contact at 7^a the armature of the magneto electric device is caused to move rapidly by the depression of the end of the lever 12 connected with the rod 13. This rapid movement of the armature within its own permanent field tends to generate a current of its own the strength of which is inversely in simple proportion to the resistance of the main line and the electro magnetic retardation or torque due to such current acts as a damper or magnetic brake and tends to prevent the rotation of the armature and in this way stops the armature at a predetermined point so long as the line resistance remains below the point for which the testing device was originally set, but when the line resistance gets above the point for which the testing device is set the magnetic retardation is insufficient to overcome the torque of the added weight arm 27. This rotates the armature sufficiently to operate the alarm mechanism. If the resistance of the main line is normal the energization of the armature by the current prevents a rocking of the armature to the limit of its movement, but if the line be broken or its resistance relatively greatly increased the momentum of the armature carries it over beyond its normal position, thus imparting an impulse to the rod 15 and lever 16 which latter strikes the bell 17 and sounds the alarm, see Fig. 2. The fault of the line thus detected can also be announced either visually or audibly by any appropriate devices. A means for announcing it audibly is shown in Figs. 1 and 2. This means comprises a lever 14 pivoted at 14^a and having hinged to its

end near the armature the upper end of a rod 15 adapted to operate at its lower end a hammer lever 16 of a bell 17, as shown in Fig. 2. The lever 14 is provided with an adjustable weight 14^b so that it can be nicely adapted to the force operating it. After the armature has rocked beyond the limits of its normal position it may be restored to its original or normal position by means of a lever 18 pivoted at 18^a, the operative end of which may be within a suitable case inclosing the apparatus, while its other end projects beyond the case and within easy reach of an attendant.

To secure proper adjustment of the magneto-electric device I provide the magnet with an adjustable plate 2^a, and with suitable means for clamping it thereto in adjusted position. When the plate 2^a is adjusted toward the poles of the magnet it diminishes the strength of the magnetic field and reversely. By adjusting the plate 2^a, therefore, the power exerted on the armature by the magnet can be regulated so that the momentum imparted to it by the rod 27 will be sufficient to carry it beyond its normal limit when the main line circuit is broken or its resistance unduly increased.

What I claim and desire to secure by Letters Patent is:

1. In a magneto-electric signaling system, a main line and a shunt circuit therefrom, combined with a main line testing mechanism comprising a magneto-electric generator associated with the main line, a motor, a contact device in said shunt circuit consisting of a spring arm, 7, and a contact point, 7^a, and means operative by the motor for contemporaneously operating the armature of the said magneto-electric generator and engaging said spring arm to break its contact with said point.

2. In a magneto-electric signaling system, a main line and a shunt circuit therefrom, combined with a main line testing mechanism comprising a magneto-electric generator associated with the main line, a motor, a contact device in said shunt circuit consisting of a spring arm, 7, and a contact point, 7^a, a rod 10 and means for intermittently operating the same by said motor, a pivoted dog 11 carried by said rod for intermittently engaging said spring, 7, to break contact with said point, 7^a, a lever 12 also connected with said rod 10 to intermittently operate said armature, substantially as described.

3. In a magneto-electric signaling system, a main line and a shunt circuit therefrom, combined with a main line testing mechanism comprising a magneto-electric generator associated with the main line, a motor, a contact device in said shunt circuit, a rod, 10, and means for intermittently operating the same by said motor, means on said rod for breaking said shunt circuit, a lever, 12, connected with said rod and a rod, 13, operatively connected with said armature, the connection between the rods 12 and 13 being sliding.

4. In a magneto-electric signaling system, a main line and a shunt circuit therefrom, combined with a main line testing mechanism comprising a magneto-electric generator associated with the main line, a motor, a contact device in said shunt circuit, a rod, 10, and means for intermittently operating the same by said motor, means on said rod for breaking said shunt circuit, a lever, 12, and a rod, 13, with a sliding connection between them, the normal position of said armature being that of equilibrium produced by the permanent magnet of the magneto-electric generator.

5. In a magneto-electric signaling system, a main line and a shunt circuit therefrom, combined with a main line testing mechanism comprising a magneto-electric generator provided with an over balancing weight, said generator being associated with the main line, a motor, a contact device in said shunt circuit, a rod, 10, and means for intermittently operating the same by said motor, means on said rod for breaking said shunt circuit, means between said rod and the armature including a sliding connection for operating the armature, the normal position of said armature and said weight being that of equilibrium produced by the permanent magnet of the magneto-electric generator.

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Witnesses:
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