No. 664,802. Patented Dec. 25, 1900.

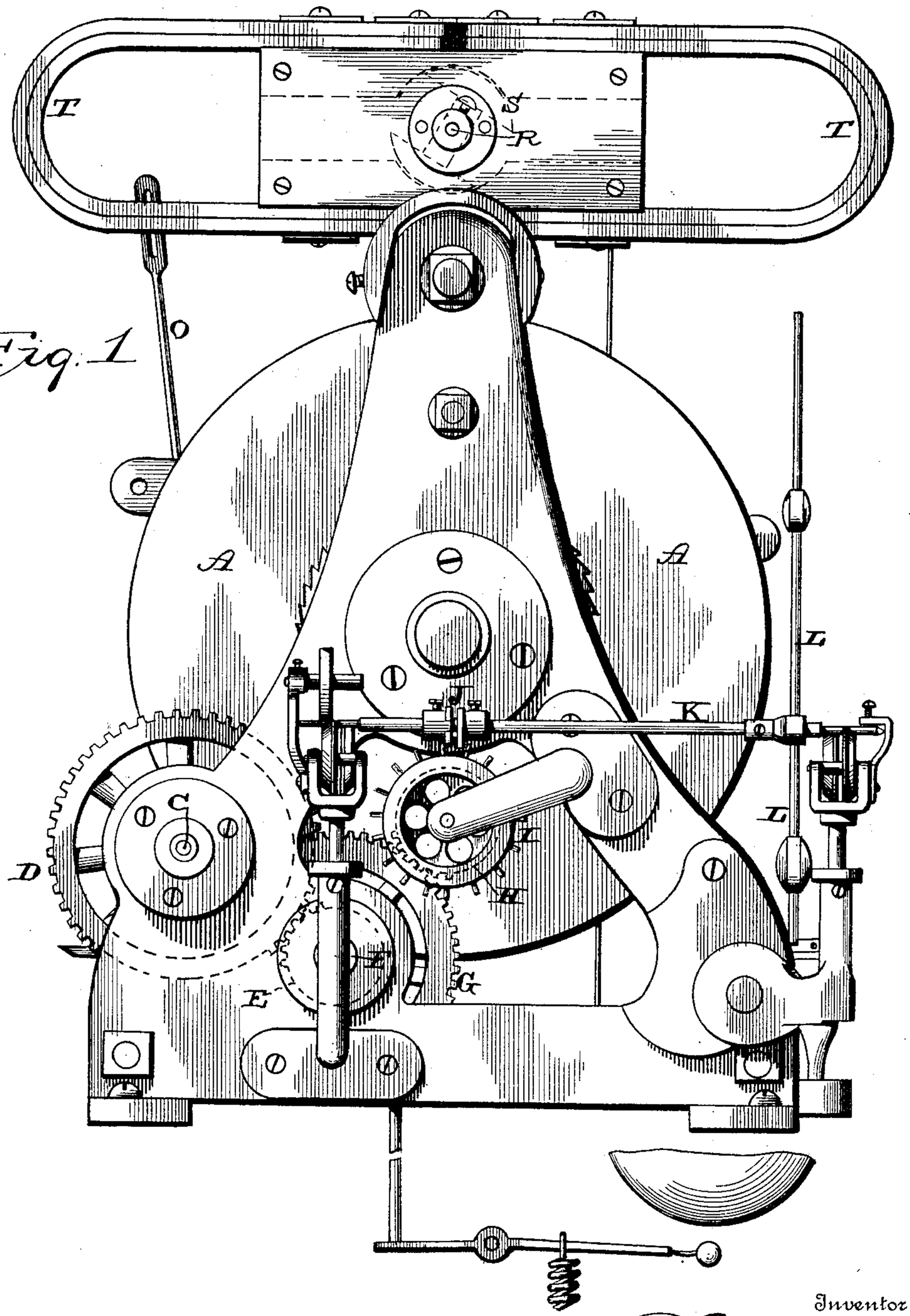
L. G. WOOLLEY.

FIRE ALARM TELEGRAPH.

(Application filed July 20, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1



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By

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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

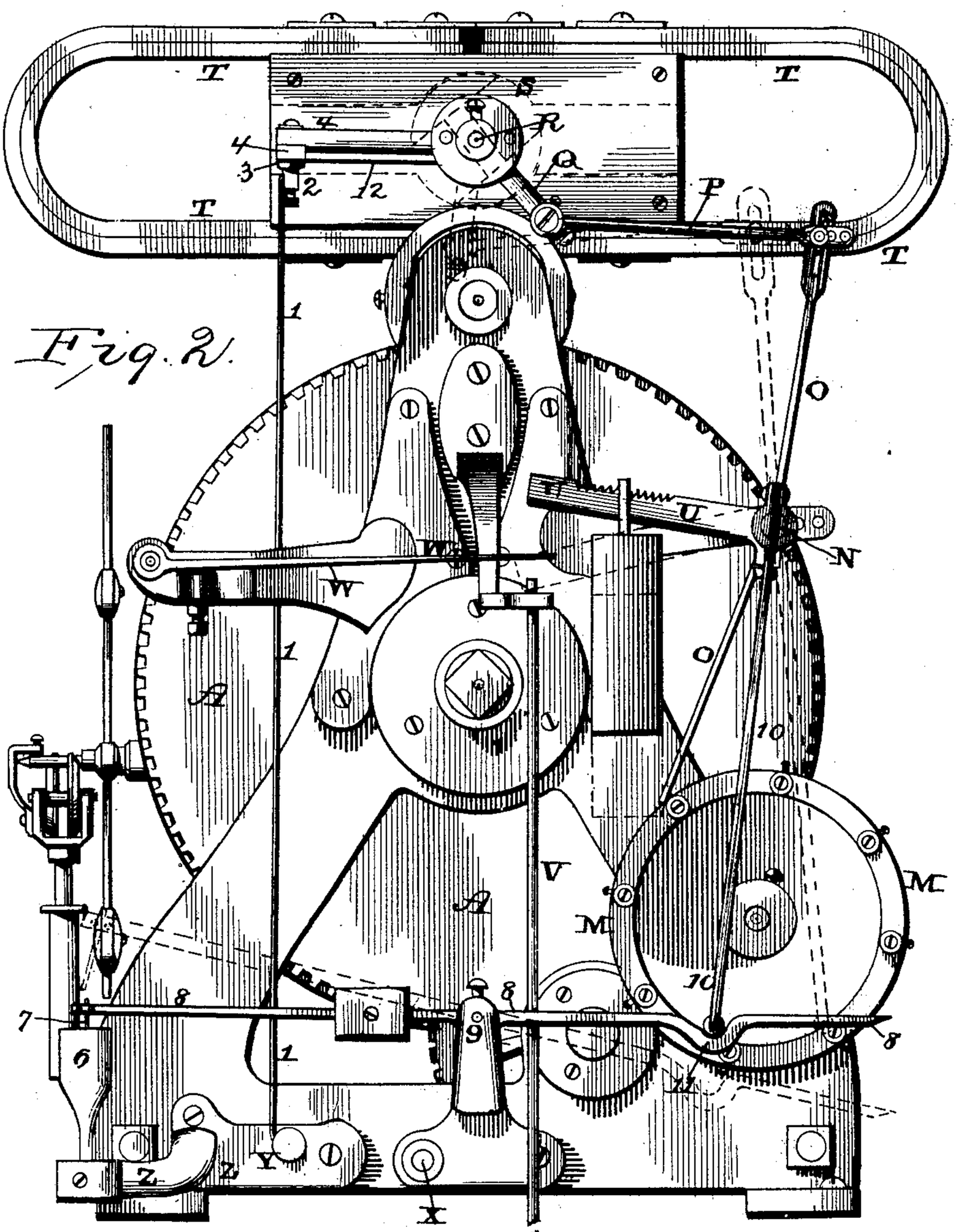

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Fig. 3

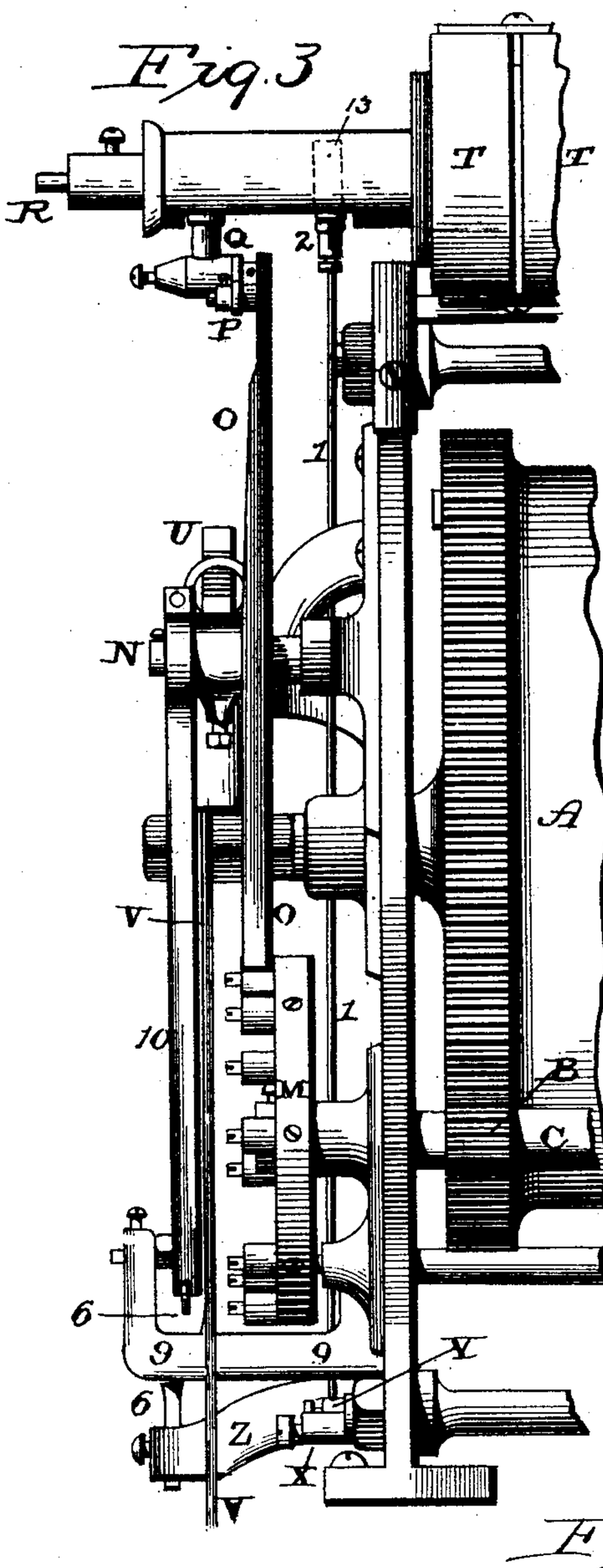


Fig. 4

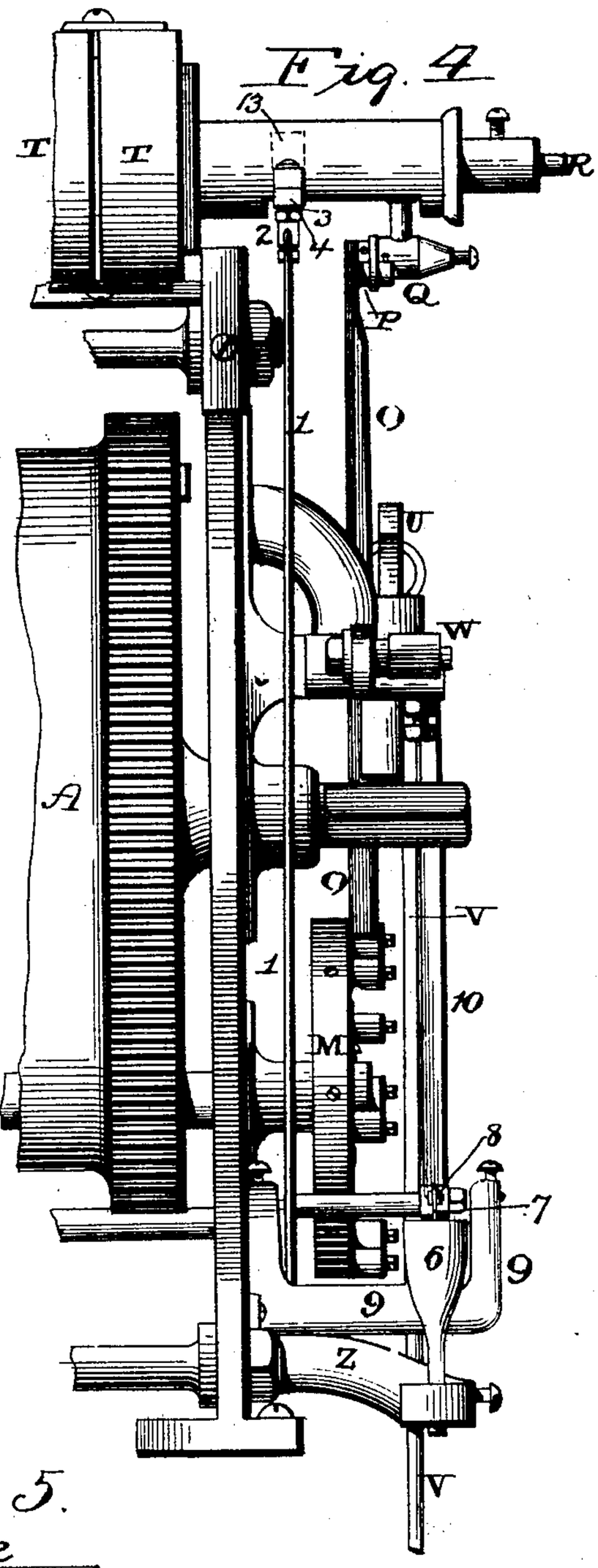
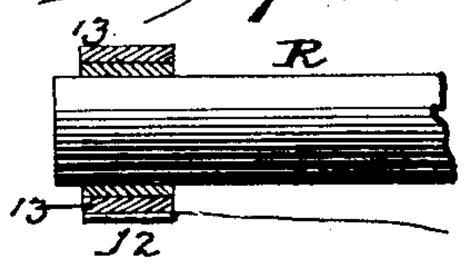


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

LEONIDAS G. WOOLLEY, OF KENTON, OHIO, ASSIGNOR TO THE NATIONAL MAGNETO ELECTRIC TELEGRAPH COMPANY, OF SPRINGFIELD, OHIO.

FIRE-ALARM TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 664,802, dated December 25, 1900.

Application filed July 20, 1900. Serial No. 24,303. (No model.)

To all whom it may concern:

Be it known that I, LEONIDAS G. WOOLLEY, a citizen of the United States, residing at Kenton, in the county of Hardin and State of Ohio, have invented certain new and useful Improvements in Indicators for Fire-Alarm Telegraphs; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in indicators for fire-alarm telegraphs; and its object is to produce an indicator which will send out at predetermined times over the entire fire-alarm circuit an electrical impulse to see whether the lines are in working condition, and, if they are not, to sound an alarm and to continue sounding the alarm from time to time until the break in the circuit is corrected.

My invention consists in, first, a suitable operating mechanism, a regulator so as to impart an even movement to the said mechanism, and a magneto-electric generator, in combination with means for operating the electric generator at predetermined times and a shunting device in said generator which is also operated at regular intervals; second, a shunting device used in a normally-closed circuit, in combination with means for operating the shunting device at predetermined times and means located in the shunt for sending an electrical impulse over the normally-closed circuit when the shunting device is operated to interrupt the shunt, and, third, in the arrangement and combination of parts, which will be more fully described hereinafter.

In the accompanying drawings, which represent my invention, Figures 1 and 2 are side elevations of an indicator which embodies my invention, taken from opposite sides. Figs. 3 and 4 are side elevations of the mechanism for operating the magneto-electric machine and sounding the alarm when the circuit is broken, taken from opposite sides. Fig. 5 is a detail view.

A represents an inclosing drum, in which is placed a coiled spring, and which drum is provided with cogs upon its periphery. These cogs mesh with the pinion B upon the shaft C, which is journaled in suitable framework and is provided with the cog-wheel D. This cog-wheel D meshes with the pinion E upon the shaft F, which is provided with the cog-wheel G, and which cog-wheel meshes with the pinion H upon the shaft, which carries the escapement-wheel I near its outer end. This escapement-wheel I engages with the pallets J upon the shaft K, which is preferably journaled upon antifriction-rollers, and to which shaft is secured the vibrating lever L. This lever L is provided with weights which can be adjusted so as to give any desired speed to the operating parts, and thus cause an electrical impulse to be sent out over the line at greater or less intervals of time, as may be desired. The shaft K is started to revolve by moving the lever L, and as the lever L vibrates back and forth the semirotary movement imparted to the shaft thereby is kept up by the pressure of the teeth of the escapement-wheel against the pallets J in the usual well-known manner. No novelty is claimed in the construction here shown, as this is a well-known movement.

Mounted upon the opposite end of the shaft C from the cog-wheel D is a time wheel or disk M, which is provided with a series of projections upon its outer surface and which projections are provided with antifriction-rollers. Pivoted upon the arm N, which projects outwardly from the framework, is a lever O, which has its lower end come in contact with the projections upon the time-wheel and which has connected to its upper end a connecting-rod P, and the opposite end of the connecting-rod from the lever O is fastened to the arm 10, which depends from the armature-shaft R, so that each time one of the projections upon the time-wheel operates the lever O the armature S will be quickly oscillated or rocked between the poles of the permanent magnets T. This rocking of the armature takes place at predetermined times when an electrical impulse is to be sent out over the fire-alarm system to determine whether it is in working condition or not. By

regulating the weights upon the lever L the period of time between the operations of the lever O by the time-wheel is regulated, and thus electrical impulses will be sent out about every two and one-half or three minutes over the entire system to determine whether it is in working order or not. Also secured to the arm 10 is a weighted lever U, which is placed upon the same sleeve as the lever O, so as to move at the same time, and which weighted lever U has its free end to project over the top of the rod V, which sounds an alarm of any suitable kind. Also secured to an arm projecting outwardly from the framework is a flat spring W, which also projects over the top of the rod V and acts as a buffer for the weighted lever when an alarm is to be sounded. Used in connection with this spring W is a suitable regulating-screw by means of which its tension can be adjusted at will. When the fire-alarm system is in working order, this spring W serves to prevent the weighted lever U from striking the upper end of the rod V and sounding an alarm; but when an alarm is to be sounded the spring does not prevent the end of the lever U from striking against the rod, for then the end of the weighted lever U moves with sufficient force to overcome the tension of the spring and strikes the rod V sufficiently hard to sound an alarm. If there is a break in the fire-alarm system, this weighted lever U at regular intervals of time continues to strike the upper end of the rod V, so as to sound an alarm of any construction preferred until the break in the system has been repaired. As soon as the break is repaired the weighted lever U ceases to operate or depress the rod V, and no alarm will be sounded until another break occurs. As will be seen, constant pressure of the antifriction-rollers upon the time-wheel against the lower end of the lever O causes the weighted lever U to rise until the lower end of the lever O slips from the roller upon the time-wheel, and then the weighted lever falls with considerable power in case the circuit is broken, and the armature has no work to perform in passing the poles of the permanent magnets. In causing the free end of the weighted lever to thus rise power is stored between each interval of time, and this stored power is utilized in operating the magneto-generator and sounding an alarm whenever the current is broken. The weighted lever thus performs the double function of operating the generator and sounding the alarm.

The magneto-electric machine consists of any suitable number of permanent magnets T, which have their ends secured to opposite poles in the usual manner, and the armature is of a two-pole Siemens or H construction. This armature each time that it is operated when there is no break in the system generates a current in the usual manner, and an electrical impulse is sent out over the entire system to see whether it is in working order, one of the wires of the system being connected with the armature through the framework of the machine. As is well known in this class of magneto-electric machines, when the external circuit is closed considerable power is required to move the armature past the poles of the permanent magnets; but when the circuit is open the armature can be moved past the poles with the expenditure of a very slight amount of power. I take advantage of this principle and produce a very efficient indicator in which the impulses are sent over the fire-alarm-telegraph system at predetermined intervals for the purpose described. Should a break take place in the system, no impulse can be sent out, as the armature does no work, and it not being impeded in its movement by magnetic attraction the end of the weighted lever U descends upon the rod V and sounds an alarm. The electrical impulses sent out over the system do not pass through the fire-alarm boxes, which are normally shunted out of circuit, and hence no charged circuit is necessary, and the battery-power heretofore used for this purpose is entirely done away with by my system, in which magneto-electric machines are used to operate each box. The armature S being wound with very fine wire of high resistance is normally shunted out of circuit, as none of the fire-alarm boxes in the circuit has motive force sufficient to overcome the resistance of the armature S, and hence an alarm could not be sent in while the armature S is in circuit. If an alarm should be turned in from any one of the boxes at the same instant the armature is in circuit, one of the five signals usually turned in by the box will be lost; but all of the other four will be correctly received. One of the terminals of the fire-alarm circuit is attached to the binding-post X and the other to the binding-post Y, which binding-post Y is secured to an insulated arm Z, secured to the lower part of the framework. The current which passes in through the binding-post X passes up through the framework of the machine to the core of the armature. Also attached to the binding-post Y is the wire 1, which extends upwardly and is connected to the binding-post 2, connected to the plate 3, which extends along under the insulated arm 4. The arm Z is insulated from the framework and has attached to its outer end a mercury-cup 6, into which a needle 7 upon the end of the pivoted weighted lever 8 dips. This lever 8 is pivoted upon a suitable bearing 9, which projects outwardly from the side of the machine sufficiently far to bring the lever in a line with the cup, and upon this lever is placed a suitable weight, so as to cause it to act more or less quickly. The lever and the mercury-cup form the shunt to cut the armature S out of circuit, and thus allow the signals from the fire-alarm boxes to be turned in. Secured to the same sleeve as the weighted lever U and the lever O is an arm 10, the lower end of which is provided with an antifriction-roller and which roller

rests normally upon the top of the lever 8. As the time-wheel M operates the lever O and the weighted lever U the arm 10 is moved at the same time, and the lower end of the arm moves back and forth over the top of the lever 8. As the weighted lever U is raised the lower end of the arm 10 moves inwardly over the top of the lever 8 until its roller enters the bend 11 in the top of the lever 8, and there it remains until the lever O slips from one of the rollers from the time-wheel, allowing the weighted lever U to drop, and then the arm 10 is suddenly and forcibly moved outwardly at the same instant, and by striking against the bend or incline in the lever 8 this end of the lever is suddenly depressed and the needle 7 is withdrawn from the cup of mercury, thereby opening the shunt, so that the impulse produced in the magneto will pass out over the circuit. Just at the moment when the armature moves past the poles of the permanent magnet the lever 8 is quickly raised from the cup of mercury and the short circuit or shunt is removed, and then the impulse sent out over the line passes through the wire 1 up to the binding-post 2 and through the plate 3 to the spring-arm 12 to the insulated collar 13, placed upon the armature-shaft.

Having thus described my invention, I claim—

1. In a fire-alarm-telegraph indicator, a suitable motive power, a regulating mechanism therefor, and a time-wheel operated by the motive power, combined with a magneto-electric generator, and means for operating the magneto-electric generator through the time-wheel, whereby an electrical impulse is sent out over the system at predetermined times, substantially as shown.

2. In a fire-alarm-telegraph-circuit indicator, a motive power, and a time-wheel operated thereby, combined with a magneto-electric generator, and a lever connected to the generator and operated by said time-wheel whereby an electric impulse is sent out over the fire-alarm system at predetermined times, substantially as described.

3. In a fire-alarm-telegraph-circuit indicator, a motive power, a time-wheel operated thereby, a lever operated by the time-wheel, and a magneto-electric generator operated by said lever, combined with a weighted lever, and an alarm mechanism operated by said weighted lever when the circuit is broken, substantially as set forth.

4. In a fire-alarm-telegraph-circuit indicator, a motive power, a time-wheel operated thereby, a lever operated by the time-wheel, and a magneto-electric generator which is operated by said lever, combined with a weighted lever which has its free end raised between the times at which impulses are sent out over the line, and which lever by its falling movement operates the electric generator, substantially as specified.

5. In a fire-alarm-telegraph-circuit indicator, a motive power, a regulator therefor, a time-wheel, a lever O operated by said time-wheel, and a weighted lever U connected to the same arm, a lever connected to the upper end of the lever O, and a magneto-electric generator operated by the lever O, combined with an arm 10, connected to the same arm as the levers O and U, and a shunting device which is operated by said arm 10, substantially as shown.

6. In a fire-alarm-telegraph-circuit indicator, a motive power, a time-wheel operated thereby, a lever operated by said time-wheel, and a magneto-electric generator operated by said lever, combined with a weighted lever, a spring which acts as a buffer for the lever, and an alarm which is also operated by said weighted lever, substantially as described.

7. In a fire-alarm-telegraph-circuit indicator, a motive power, a time-wheel operated thereby, a lever operated by the time-wheel, and a magneto-electric generator operated by said lever, combined with a weighted lever for operating the magneto-electric generator, an alarm which is also operated by said weighted lever, a spring which acts as a buffer for the weighted lever, an arm, and a shunting mechanism for shunting the magneto-electric generator out of circuit, substantially as set forth.

8. In a fire-alarm-telegraph-circuit indicator, a motive power, a regulator therefor, and a magneto-electric generator, combined with means for operating the electric generator at predetermined times, and a shunting device for said generator which is also operated at regular intervals, substantially as specified.

9. In a fire-alarm-circuit indicator, a shunting device, used in a normally-closed circuit, combined with means for operating the shunting device at predetermined times, and means located in the shunt for sending an electrical impulse over the normally-closed circuit when the shunting device is operated to interrupt the shunt, substantially as shown.

In testimony whereof I affix my signature in presence of two witnesses.

LEONIDAS G. WOOLLEY.

Witnesses:

ROSANN SMITH,

ZORA M. WOOLLEY.