

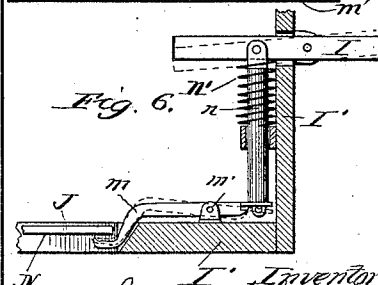
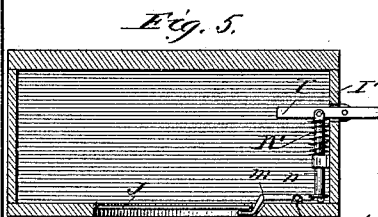
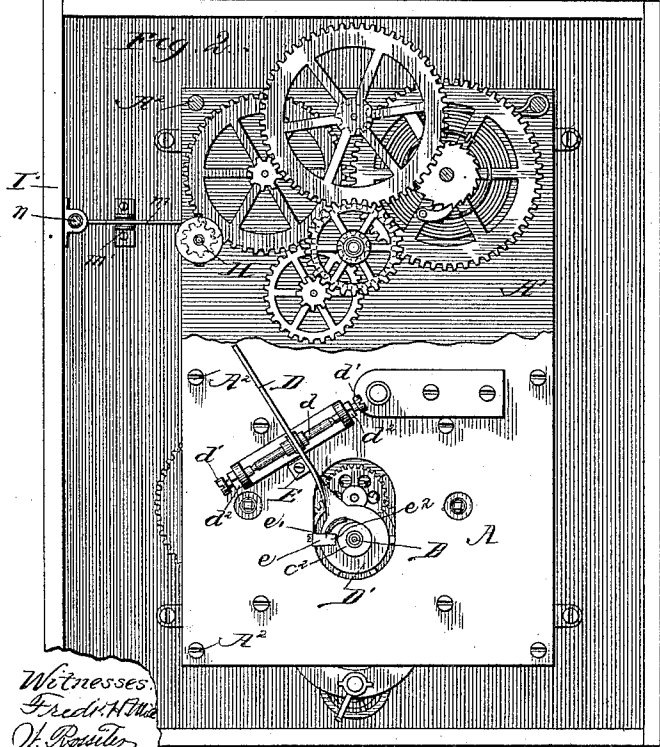
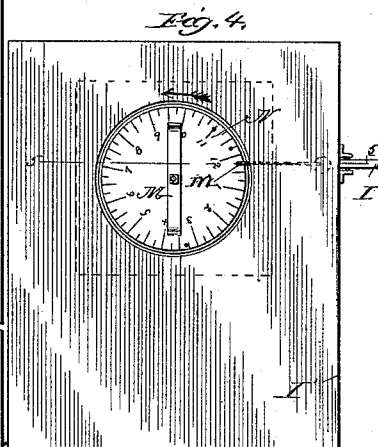
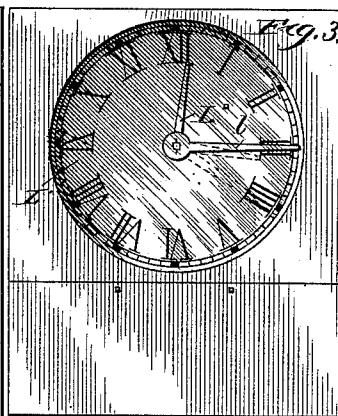
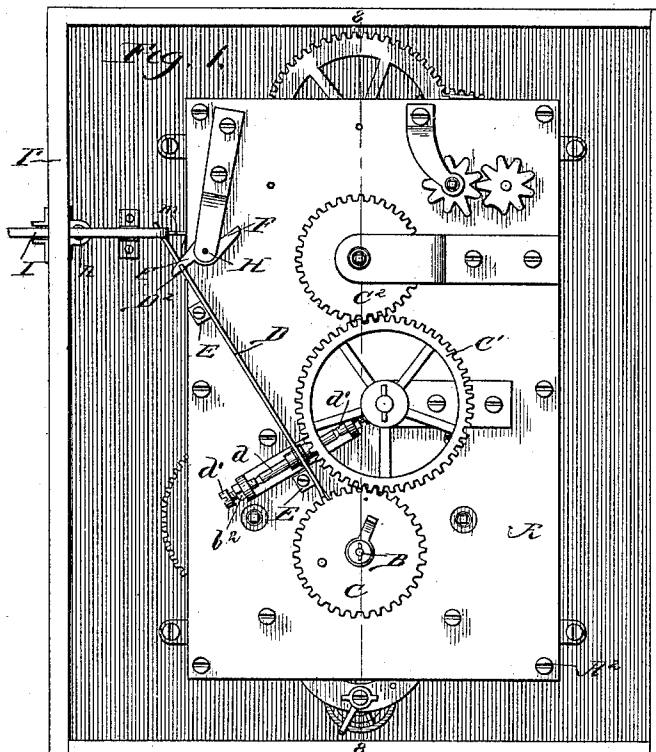
(No Model.)

3 Sheets—Sheet 1.

J. A. SMITH.
RAILWAY TIME SIGNAL.

No. 465,118.

Patented Dec. 15, 1891.



Witnesses
Fred. H. Allen
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I. Inventor.
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(No Model.)

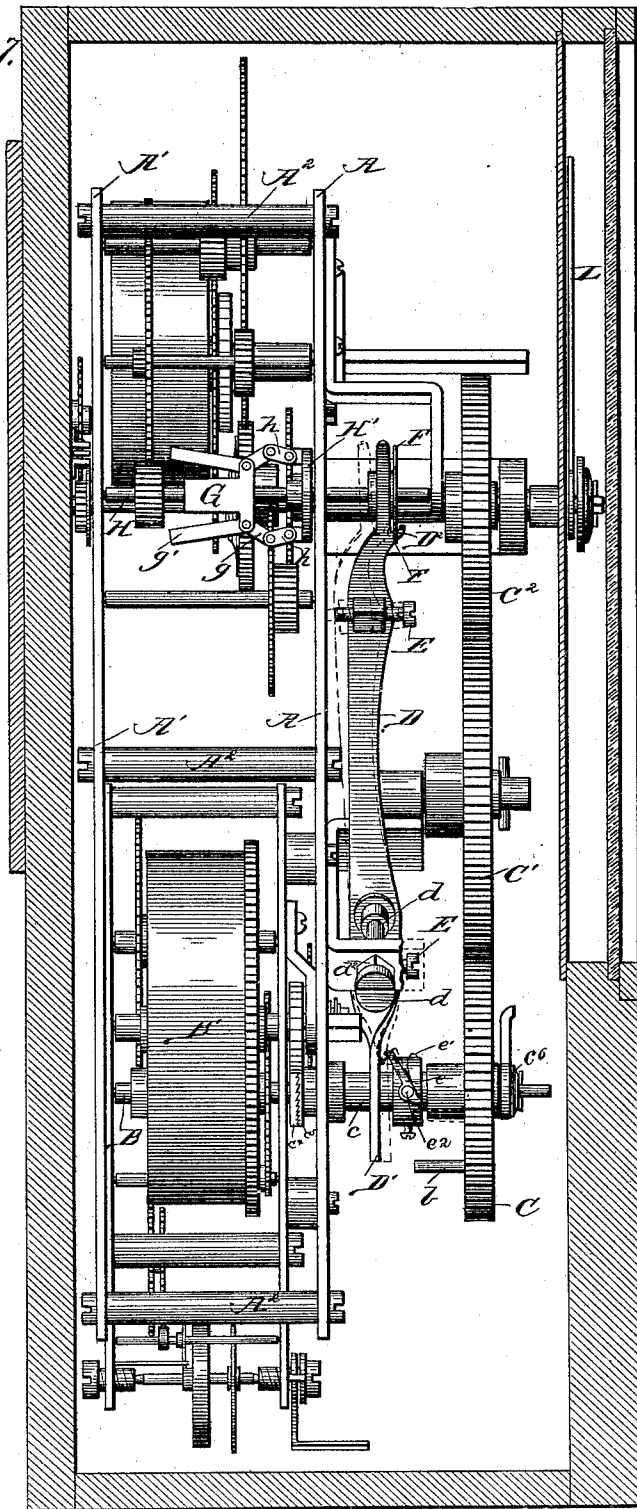
3 Sheets—Sheet 2.

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Fig. 1.



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UNITED STATES PATENT OFFICE.

JAMES A. SMITH, OF POUGHKEEPSIE, NEW YORK.

RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 465,118, dated December 15, 1891.

Application filed December 16, 1890. Serial No. 374,920. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. SMITH, of Poughkeepsie, in the State of New York, have invented certain new and useful Improvements in Railway Time Signals and Recorders, of which the following is a specification.

My invention relates to railway time signals and recorders of the class shown in United States Letters Patent No. 417,749, of December 24, 1889, granted to myself and V. B. Giddings; and the objects of my improvements are, first, to better the construction and adaptation of the tripping-lever connecting the two mechanisms, and, second, to provide a recording attachment in connection therewith, whereby a record of the trains passing over the road and of the time when they pass is kept. These objects I have attained in the apparatus constructed as illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the mechanism, the dial being removed. Fig. 2 is a front view differing from that shown in Fig. 1 in having portions broken away or removed to expose other parts to view. Fig. 3 is a front elevation reduced in size and provided with a signal-dial and front plate. Fig. 4 is a rear elevation showing the recording mechanism. Fig. 5 is a horizontal section taken on the line 5 5 of Fig. 4 and showing a plan view of the recording-lever and its arrangement relatively to the trip-lever. Fig. 6 is a detail showing a fragment of a horizontal section with the recording-lever, &c., enlarged. Fig. 7 is an enlarged side elevation of the apparatus. Fig. 8 is an enlarged central section taken on the line 8 8 of Fig. 1, looking toward the right.

In the drawings, A designates the front or top plate of the frame for supporting the train of mechanism, and A' the rear or bottom plate. These plates are connected at the corners and elsewhere by posts A² in the ordinary way, said plates being about double the length required for a single clock mechanism.

B is a spindle connected with the plates A A', and has the ordinary connection with a common train of clock mechanism located between said plates, which it is not deemed necessary to describe. Near the outer end of said spindle is a wheel C, which is loosely mounted on the outer sleeve c and adapted

to revolve independently thereof. Said sleeve c has the usual connection with the clock-train, being geared therewith through the minute-wheel c', so that its movement will correspond with that of the minute-hand of an ordinary clock, making a revolution every hour and carrying with it a collar c², attached by a set-screw. The inner sleeve c³ in like manner corresponds to that of an ordinary clock, and is geared to the clock-train so as to rotate in correspondence with the hour-hand, making one revolution in twelve hours. Said inner sleeve c³ is fixed to the spindle B in such manner as to leave the sleeve to be turned forward independently of the spindle, but not back. This result is secured by means of a clutch which has one part c⁴ fixed to the spindle and the other part c⁵ to the sleeve, so that when the inclined teeth on the opposing parts of the clutch are brought together they form a rigid connection, which will prevent turning the sleeve backward, and at the same time allow the sleeve to be turned forward for the purpose of setting, a spring-washer c⁶ being adapted to bear on the opposite end of the sleeve to hold the teeth together, but permit them to yield enough to pass over their incline when the sleeve is turned forward. The work required of this sleeve in this class of apparatus is so much greater than that required of it in an ordinary clock that the ordinary connection will not satisfactorily perform the same, and hence I have provided and adapted the clutch in place of the ordinary connection.

Instead of a jointed trip-lever like that of my said former patent, I have provided a trip-lever D, made of one piece, and connected it to the plate A by means of an adjustable connection consisting of a shaft d for supporting said trip-lever, provided with spindle ends adapted to fit into recesses in the ends of screw-bolts d', which have jam-nuts d², whereby the pressure of said bolts upon the spindle ends of said shaft may be regulated so as to delicately hold the trip-lever attached to said shaft in proper position and subject to be moved by slight force.

Another novel feature in conjunction with the trip-lever consists in the set-screws E, arranged upon each side of the pivotal point

of the trip-lever and adapted to strike the plate A, and thereby regulate the amount of the said lever's movement. This I have found to be of great advantage in bringing the trip-lever into working relation with the two mechanisms and making it operate without unnecessary loss of motion.

The plate or disk D', forming part of the trip-lever D, has a central opening adapted to pass over the sleeve c of the spindle B, so as to permit said disk to play up and down for operating the trip-lever, and the traveling cam e is pivotally connected with the collar c² of said sleeve and has its lower end resting on said disk and its upper end in the path of the pin b, so as to be struck thereby for pressing the disk down to operate the trip-lever. A light wire spring e', soldered at one end to the collar c², is adapted to bear with its other end upon said cam near its pivotal connection e² with said collar. There is no substantial change in the disk or other of these parts or their arrangement over the corresponding parts of my said former patent, except in the arrangement of said spring, which is such as to cause said spring to bear upon said cam near its pivotal connection with said sleeve. This arrangement materially better the operation by adapting the spring to hold the lower end of the cam in slight contact with the disk and to permit the stop-pin b on the wheel C to pass over said cam in making its normal revolutions without perceptible resistance.

The free end of the trip-lever D is provided with an arm or projection D² for engaging with the escapement F of the signaling part of the apparatus.

In order to prevent too rapid movement of the escapement, such as might, after long runs, endanger breakage or displacement of parts by sudden stoppage, I arrange and secure a governor G upon the escapement-shaft H and connect a sliding plate H' therewith by means of links h, which are pivoted to ears or lugs of said sliding plate and to projections g on the governor-arms g', whereby any revolution sufficient to throw the free ends of the governor-arms outward will move the sliding plate into contact with the top plate A and create sufficient friction to check the speed of revolution and prevent its becoming too great. The trip-lever also has contact with a lever I, pivoted in the frame I', whereby it may be disengaged from the escapement by any force properly applied to the outer end of said lever I.

The recording part of the apparatus is composed of a disk J, preferably of soft wood, secured to an outer sleeve i upon the end of the spindle K of the signaling part of the apparatus, projected through the bottom plate A'. This disk is geared by the wheel i' on the sleeve i, the pinion k on the inner sleeve i², the wheel k', and the pinion k², all of ordinary construction, in such manner as to move in

the same time as the hour-hand L of the signal-dial L'. A spring-clamp M, secured by means of a screw-nut upon the sleeve i, is adapted to hold a paper dial N upon the said disk. Said paper dial represents a clock-dial with radial subdivisions indicating minutes, separated in groups of five, numbered or marked to correspond with those of the signal-dial. In connection with the disk is a perforator m, Fig. 2, which is pivoted to the frame at m' and has its point adapted to strike said paper dial and puncture the same when the trip-lever is operated. This result is effected by means of a link n, which connects one end of the perforator-lever with the lever I in such manner that when said lever I is operated to move the trip-lever it will also at the same time operate the perforator and puncture the dial N. A spring n' returns the lever I and holds the perforator normally out of contact with said dial N. The radial subdivisions of the dial N are placed the same relatively to the perforator as the hour-hand L is to the subdivisions of the signal-dial, so that the perforator will indicate the same time on dial N that the hour-hand does on the signal-dial, the dial N being designed to be taken off and replaced by a new one as often as the disk J makes a revolution.

The apparatus is in all respects not herein particularly described the same as that shown in my said former patent, having one independent clock mechanism in connection with the spindle B, which is designed to be normally running the same as in keeping time, but having no dial or hands, and another independent clock mechanism in connection with the spindle K, which is designed to be normally at rest, and having the signal-dial L' and hour-hand L and minute-hand L'. These two mechanisms are connected by the wheels C C' C² in the same manner as shown in my said former patent, so as to permit the first-mentioned of said mechanisms to run independently of the other one and to reverse the trip-lever after each tripping thereof by bringing the stop-pin b into contact with the cam e at the time that said latter mechanism overtakes the former.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As an improvement in apparatus of the class described, the trip-lever D, made in one continuous piece, the shaft d for supporting the same, provided with spindle ends, the screw-bolts d', provided with recesses in their ends and jam-nuts d², and the set-screws E, connected with said trip-lever at opposite sides of said shaft, the whole being connected and arranged to operate in the apparatus, substantially as shown and described.

2. As an improvement in apparatus of the class described, the escapement-shaft H, provided with a governor composed of the part G, provided with ears on opposite sides, and

governor-arms composed of the parts *g* and *g'*, pivoted to said ears, and the sliding plate *H'*, connected with the parts *g* by means of links *h*, as specified.

5 3. In an apparatus of the class described and in combination, the trip-lever *D*, the perforator *m*, link *n*, and lever *I*, said lever be-

ing adapted to operate the trip-lever and perforator simultaneously, as and for the purpose specified.

JAMES A. SMITH.

Witnesses:

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J. W. MERRIAM.