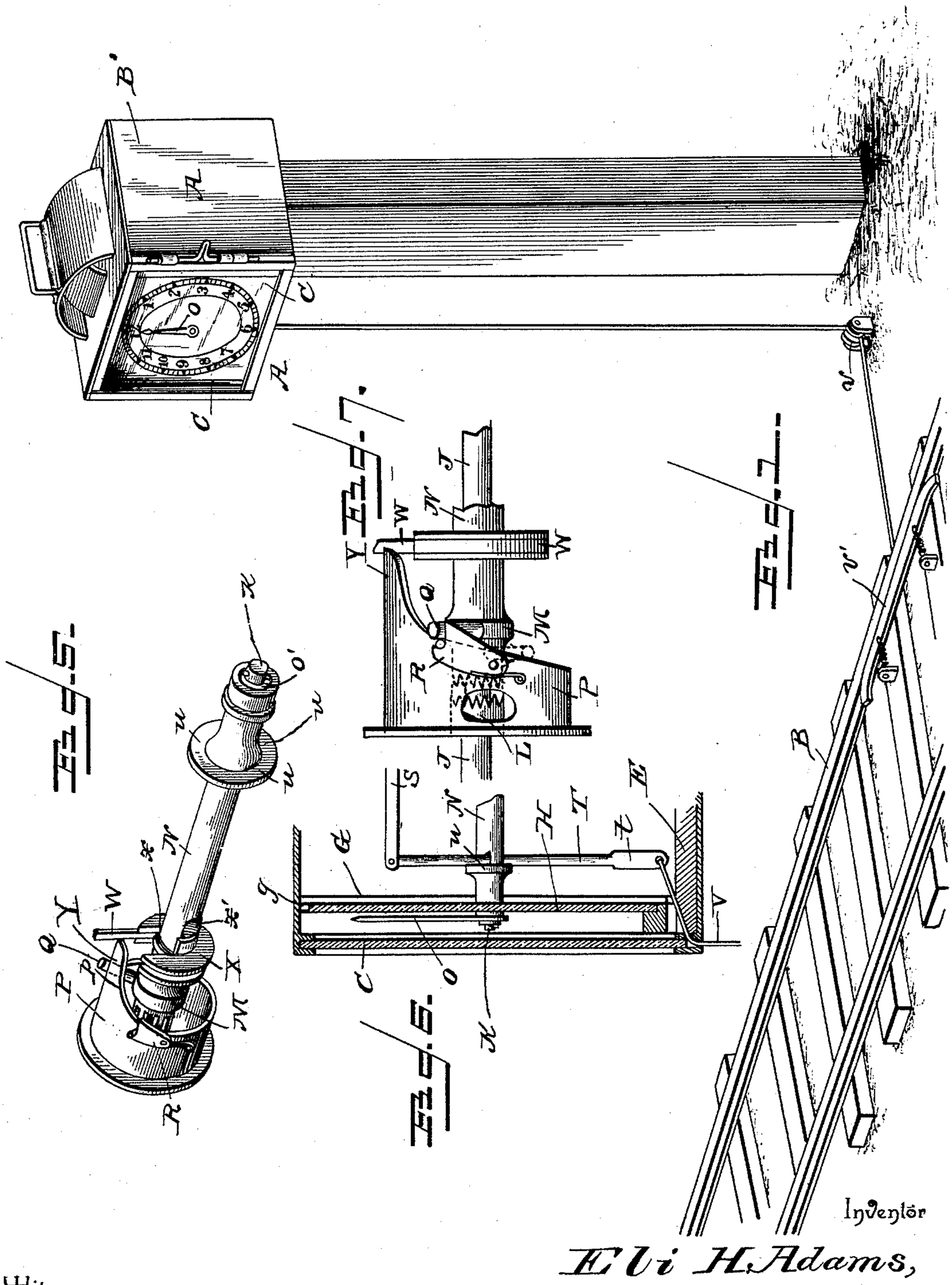
(No Model.) 2 Sheets—Sheet 1.

E. H. ADAMS.

RAILWAY TIME SIGNAL.

No. 509,785. Patented Nov. 28, 1893.



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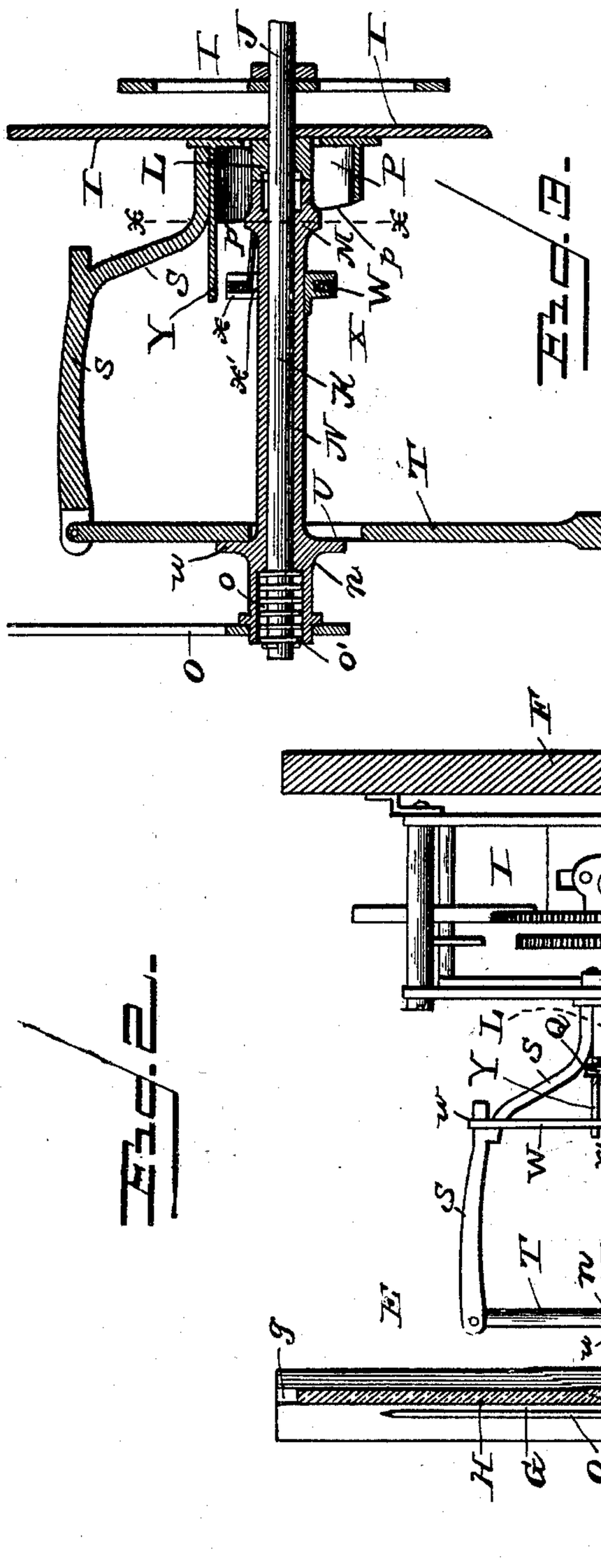

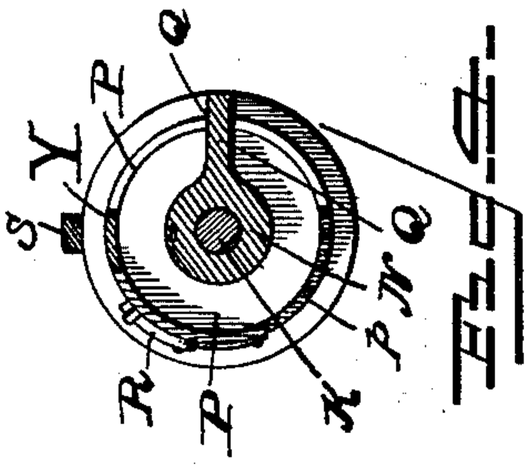

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RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 509,785, dated November 28, 1893.

Application filed June 16, 1893. Serial No. 477,822. (No model.)

To all whom it may concern:

Be it known that I, ELI H. ADAMS, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Signal-Clock, of which the following is a specification.

This invention relates to automatic signal clocks; and it has for its object to provide an improved clock of this character, which will be especially useful for railway stations at which there is no operator, and to automatically indicate to the engineer of each passing train the exact time which has elapsed since the train ahead of him has passed that station.

To this end the main and primary object of the present invention is to provide an automatically controlled signal clock for railway service having certain novel features of construction which well adapt the same for its use.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a perspective view of an automatic signal clock constructed in accordance with this invention, arranged convenient to a railway, and also showing an adjacent track and the connections for automatically controlling the clock. Fig. 2 is a side elevation of a portion of a clock mechanism having the improved signal devices connected therewith. Fig. 3 is a central vertical sectional view of the apparatus. Fig. 4 is a transverse sectional view on the line *x*—*x* of Fig. 3. Fig. 5 is a detail perspective of the sliding shaft or arbor sleeve, mounted in front of the cam flange. Fig. 6 is an enlarged detail sectional view of the casing front. Fig. 7 is an enlarged detail elevation, showing clearly the operation of the disengaging arm in connection with the stop dog.

Referring to the accompanying drawings, A represents a clock case adapted to be arranged adjacent to the track B, so as to be conveniently observed by the engineers of passing trains, and said clock case is provided with a removable glass front C, and an inclosing side door B′. The clock case A, is adapted to receive the frame E, having a rear side board F, and a removable dial frame G, arising from the front edge thereof in rear of the glass front C, of the casing, and provided with the side grooves *g*, to receive the opaque or other suitable dial H, on which are painted in conspicuous colors the ordinary clock dial numerals ranging from 1 to 12, and in the present invention designed to indicate from one minute up to the sixty minutes, whereby the hand traveling over the dial will indicate to the engineer the exact time which the last train is ahead of him as will be more fully explained, and directly in rear of the dial H, and supported on the frame E, is a lamp *h*, which insures the figures of the dial being seen at night time.

Securely attached to the rear side board F, of the frame E, is an ordinary clock mechanism I, having the main minute hand shaft or arbor J, which is operated by the mechanism, and is designed to make one complete revolution of the dial in one hour, and said shaft or arbor J, is provided with a forward extension K, which projects beyond the frame of the mecbanism and through the central opening of the dial H. The minute hand shaft or arbor J, carries at a point just ouside of the frame of the mechanism I, the clutch collar L, which is adapted to be carried around with the shaft, and which is normally engaged by the inner toothed or clutch end M, of the sliding shaft sleeve N. The sliding shaft sleeve N, is of a length corresponding to the length of the shaft extension K, and has attached to its outer shouldered end *n*, outside of the dial H, the indicating hand O, which travels over the face of the dial, and indicates the number of minutes which it has traveled from the starting point "12," from which it begins a new travel after each passing train. The said sliding shaft sleeve is further provided at its outer end with the spring-receiving socket *o*, adapted to receive the spiral spring *o′*, arranged on the outer end of the shaft extension K, and normally tending to slide the sleeve in a direction which causes its inner clutch end to engage the clutch collar of the hand shaft or arbor J, so that as such shaft or arbor is revolved by the clock mechanism, the sleeve with its attached hand is also

revolved so as to give the proper dial indication.

Securely attached to the frame of the clock mechanism and projecting laterally therefrom is the off-standing circular cam flange or ring P. The flange or ring P, encircles the clutch device L, M, and is provided with an outer inclined or cam edge *p*, over which is adapted to ride the disengaging arm Q, projected from the clutch end M, of the shaft sleeve N, so that as the said sleeve revolves together with the shaft extension, the disengaging arm travels up to a point of the inclined or cam edge, at which the clutch end of the sleeve will be caused to be automatically disengaged or thrown out of gear with the clutch collar of the shaft, when the hand has reached its limit point on the dial, which of course has been previously determined. When the disengaging arm Q has been revolved to a point on the edge *p*, so that the shaft sleeve has been thrown out of engagement with the shaft, the said disengaging arm is at such point automatically engaged by the shouldered spring actuated stop dog R, pivoted to the outside of the flange or ring P, and normally pressed beyond the outer edge thereof. The stop dog R, therefore serves to hold the shaft sleeve stationary and out of engagement with the shaft while the clock mechanism still continues to work, until the said shaft sleeve is again automatically thrown into gear with the shaft by the mechanism which I shall now proceed to describe.

Fastened at its inner end to the top of the cam flange or ring P, is the off-standing bracket arm S, having an outer bifurcated end adapted to pivotally receive the upper end of the hanging pendulum lever T. The hanging pendulum lever T, is provided with a lower weighted end *t*, which normally holds the lever in a vertical position and intermediate of its ends the said pendulum lever is provided with a hook or yoke U, adapted to loosely embrace the shaft sleeve N, at one side of the flange shoulder *u*, formed thereon at the inside of the dial H. To the lower weighted extremity of the hanging pendulum lever is attached the trip wire V, which passes outside of the clock casing, around suitable guide pulleys *v*, and is attached at its outer end to the laterally sliding spring rail *v'*. The laterally sliding spring rail *v'*, is suitably arranged on the track B, at one side of one of the rails thereof, so that the flanges of the car wheels will pass between the track rail and the spring rail, so as to move the latter away from the former and thereby pull on the trip wire V. This motion pulls out the lower end of the hanging pendulum lever T, so as to draw the same against the flange shoulder *u*, of the shaft sleeve, thereby drawing the said shaft out against the tension of the spring *o'*, so that the disengaging arm Q, will be drawn away fro m the shouldered dog R, thereby leaving the shaft sleeve free to revolve under the tens*i*on of the sleeve revolving spring W. The sleeve revolving spring W, is attached at one end as at *w*, to the off-standing bracket arm S, and is coiled on the grooved drum disk X. The drum disk X, is slotted at one side as at *x*, so as to fit the flattened portion *x'*, of the shaft sleeve, thereby providing a connection with the said shaft sleeve, so that the drum disk turns therewith in one direction to wind up the spring thereon, and revolves with the shaft in an opposite direction when the spring is allowed to exert its tension by the releasement of the disengaging arm Q, from the dog R. As the trip wire V, is drawn out by the means just described, the tension of the shaft revolving spring W, will quickly revolve the sleeve back to a position at which the hand, carried thereby, will stand at its starting point "12," and this movement of the shaft sleeve is checked by the stop projection Y, extended outwardly from one side of the cam flange or ring P, and adapted to be engaged by the disengaging arm Q, when the shaft sleeve returns to a position so as to allow its clutch end to engage the clutch collar of the main shaft or arbor.

Now from the foregoing it is thought that the operation of the herein described signal clock will be readily apparent to those skilled in the art. In the first place it is to be remembered that the clock is designed to indicate the time that a train has passed a given point up to fifty or more minutes, and therefore the apparatus is constructed so as to give the indicating hand a travel from one to fifty minutes, which is the limit of its travel. Assuming that a train has just passed the point at which the signal clock is located, the shaft sleeve will then be in engagement with the shaft on which it is mounted, so as to revolve therewith and cause the hand to start on its travel from the point "12." This operation continues anywhere inside of fifty minutes until another train reaches the signal point. When the second train reaches the clock, the engineer sees exactly what length of time has elapsed since the passing of the last train, and can regulate his movements accordingly. As this second train passes the signal point, the flanges of the wheels will move out the spring rail *v'*, so as to draw on the pendulum lever T, as herein described, which operation will throw the shaft sleeve out of engagement with the shaft and allow the same to revolve back under the tension of the revolving spring W, to the starting point of the indicating hand, at which point the shaft sleeve again is pressed into gear with the clutch of the shaft by means of the spring *o'*. If the shaft sleeve has revolved sufficiently far so as to carry the indicating hand to its limit, it is automatically thrown out of gear with the clock mechanism by reason of the cam flange or ring P, and is held out of engagement at this point by means of the dog R, until another train passes the signal point as already described.

The clock herein described possesses many

points of merit, and the operation involved may be also secured by slight modifications of the construction specified, and I will therefore have it understood that changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In an automatic signal clock, the dial, the revolving clock mechanism shaft having a clutch collar turning therewith, a sleeve loosely mounted on said shaft and having a clutch end adapted to engage said clutch collar and at its opposite end a spring socket, a spring arranged in said socket and having one end engaging the sleeve to normally hold the clutch end thereof in engagement with said clutch collar, a hand attached to the socket end of said sleeve, and means for automatically throwing the sleeve in and out of engagement with said clutch collar, and also for automatically turning the sleeve to a fixed starting point, substantially as set forth.

2. In an automatic signal clock, the combination of the revolving clock mechanism shaft having a clutch collar, a sleeve loosely mounted on said shaft and having a clutch end adapted to engage said clutch collar, and at its other end a socket, a spring attached to the shaft and arranged in the socket of the sleeve to normally hold the same in engagement with said clutch collar, means for automatically throwing the sleeve out of engagement with the clutch collar, a slotted drum removably fitted on the sleeve, a spring coiled in said drum and fastened at one end to a stationary point of attachment, the dial, the hand mounted on one end of the sleeve, and a trip device, substantially as set forth.

3. In an automatic signal clock, a suitably arranged dial, the clock mechanism having an extension shaft carrying a clutch collar, a cam flange or ring encircling the shaft and its collar and having a stop at a high point thereon, a spring pressed sleeve mounted on the extension shaft and having a clutch end normally held into engagement with said clutch collar, and an off-standing disengaging arm adapted to ride on the cam flange or ring up to and into engagement with the stop thereon the hand attached to one end of said sleeve, and an automatic device for releasing the sleeve from said top and turning the same to a fixed starting point, substantially as set forth.

4. In an automatic signal clock, a suitably arranged dial, the clock mechanism having an extension shaft carrying the clutch collar, a cam flange or ring encircling the shaft and its collar and provided with a stop projection, a spring pressed sleeve mounted on the extension shaft and having a clutch end normally engaging said clutch collar, and an off-standing disengaging arm adapted to ride over the cam flange or ring in one direction, and to contact with said stop projection in the opposite direction, a sleeve-revolving spring attached to a suitable point of attachment at one end and at its other end to said sleeve to wind thereon in one direction, and a trip device for said sleeve to permit the revolving spring to act thereon, substantially as set forth.

5. In an automatic signal clock, the dial, the clock mechanism having an extension shaft carrying a clutch collar, a cam flange or ring encircling the shaft and its collar, a spring pressed sleeve loosely mounted on the extension shaft and carrying an indicating hand at one end, said sleeve having an inner clutch end normally engaging said clutch collar, an off-standing disengaging arm adapted to ride over the cam flange or ring in one direction, and a shoulder intermediate of its ends, a spring-actuated shouldered dog pivoted to the cam flange or ring and adapted to automatically engage under said disengaging arm to hold the same at the limit of its movement in one direction, a sleeve revolving spring attached to a suitable point of attachment at one end and at its other end to said sleeve, a hanging lever embracing the sleeve at one side of its shoulder, a trip wire attached to one end of said lever, and an automatic rail device connected with said trip wire, to draw the lever against the sleeve shoulder to relieve the sleeve from the clutch collar, as well as its disengaging arm from said dog, substantially as set forth.

6. In an automatic signal clock, the dial, the clock mechanism having an extension shaft carrying a clutch collar, a spring pressed sleeve loosely mounted on the extension shaft and carrying an indicating hand at one end, said sleeve having an inner clutch end normally engaging the clutch collar, and a flanged shoulder, an off-standing bracket arm secured at one end to a suitable point of attachment above said arm and the sleeve thereon, a grooved drum disk mounted fast on the sleeve, a shaft revolving spring attached at one end to said bracket arm and winding and unwinding on said drum disk, a weighted hanging pendulum lever pivoted at its upper end to one end of said bracket arm and having an intermediate hook or yoke loosely embracing the sleeve at one side of its flange shoulder, and an automatically controlled trip wire attached at one end to the lower end of said pendulum lever, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ELI H. ADAMS.

Witnesses:
EDWIN WARREN,
WALTER E. ELLIS.