L. H. CRAFT.

RAILWAY SIGNALING MECHANISM.

APPLICATION FILED SEPT. 23, 1907.

910,911.

Patented Jan. 26, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

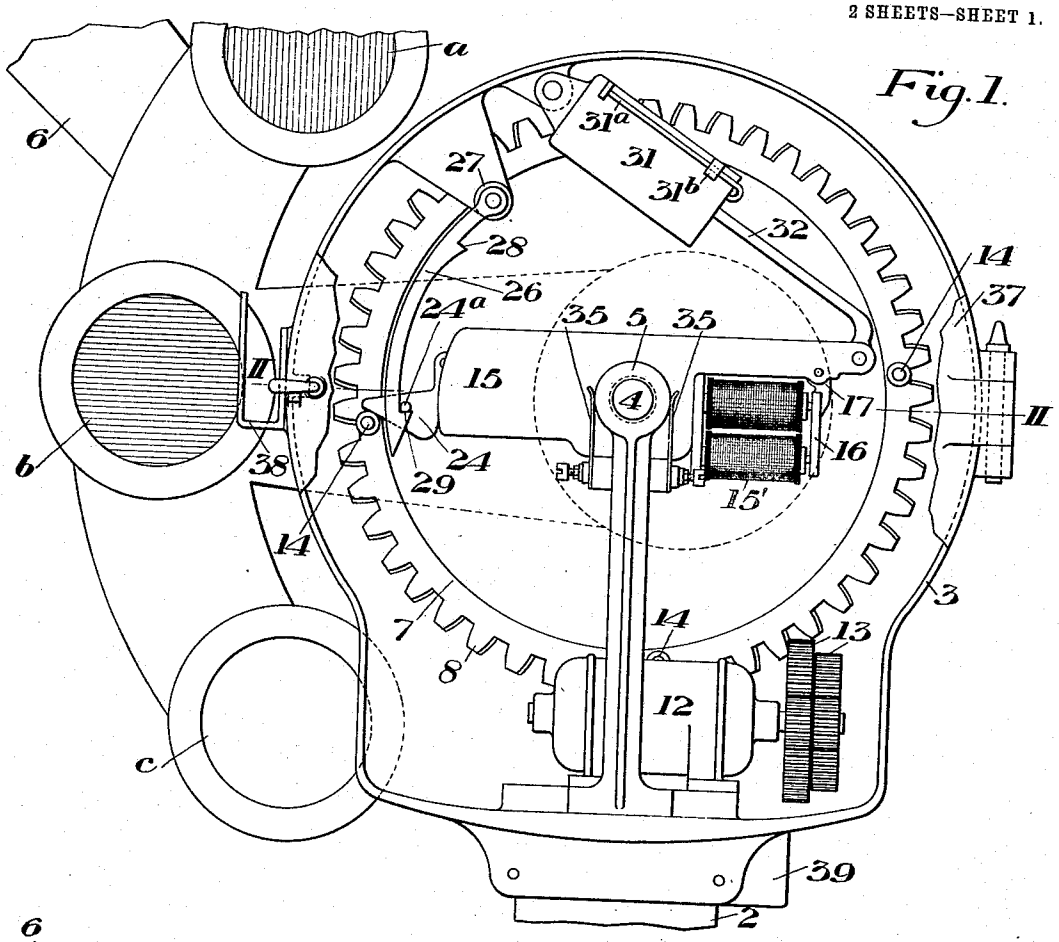
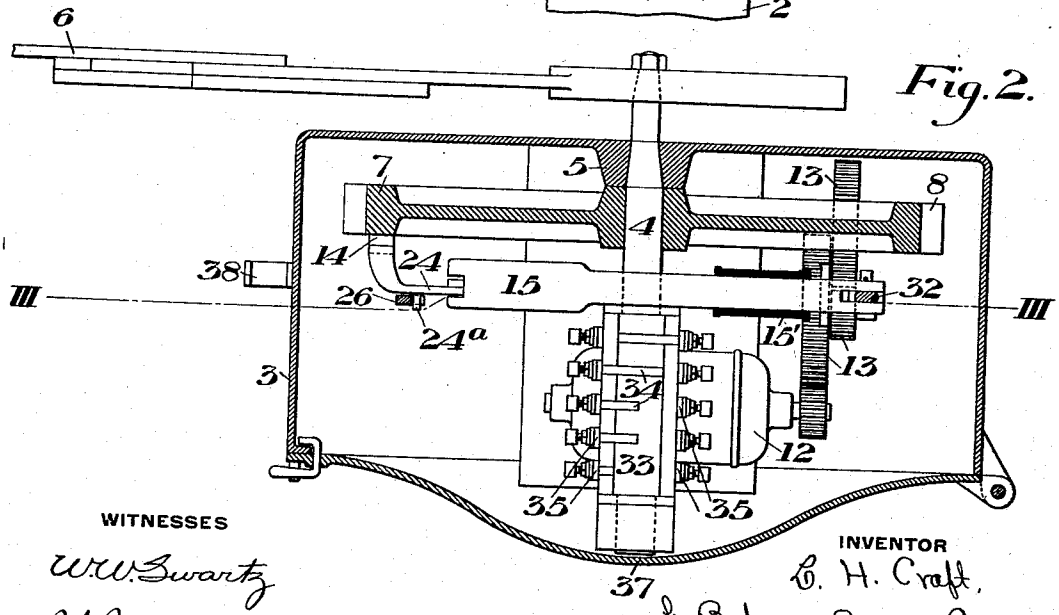


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

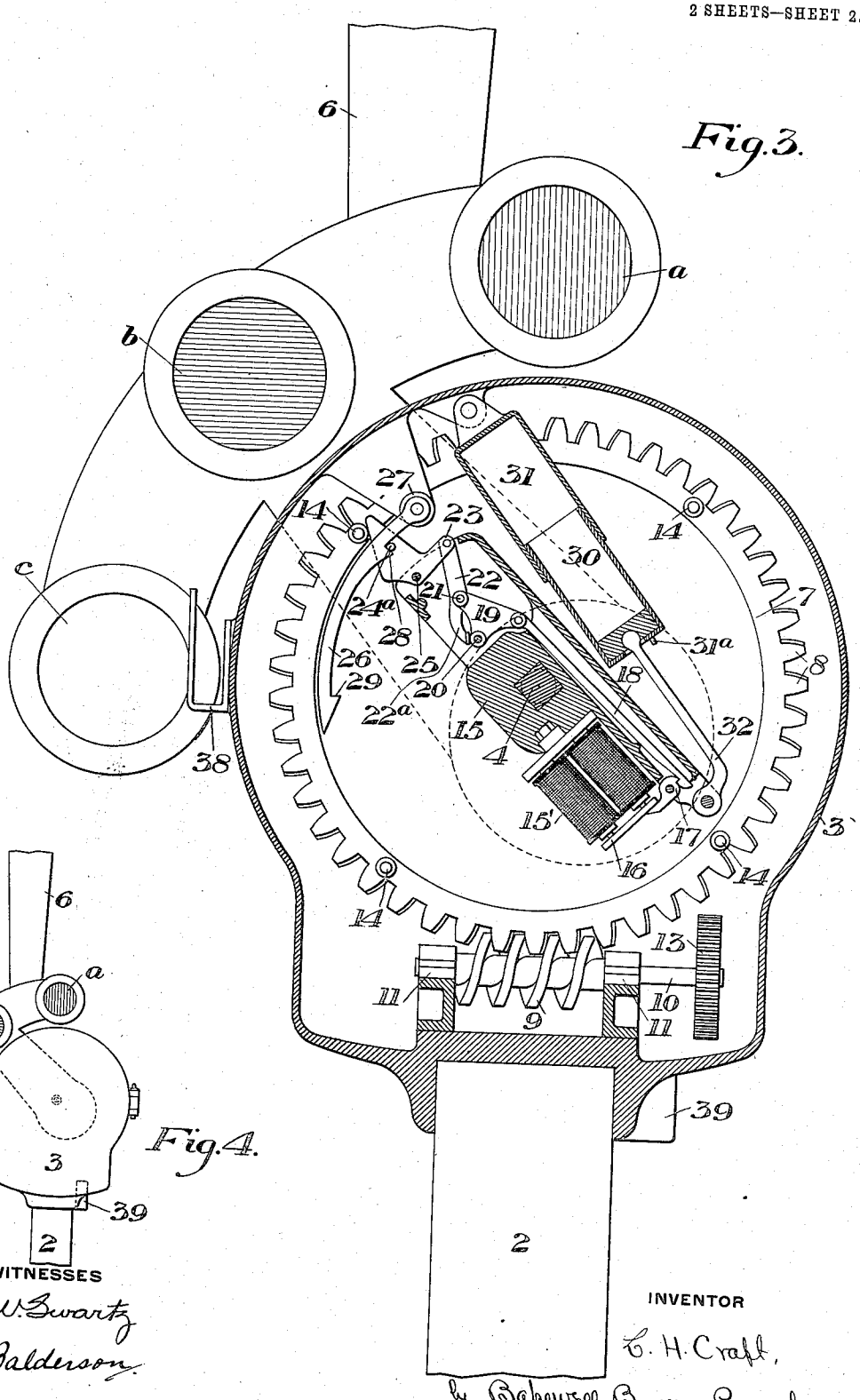


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

LEVI H. CRAFT, OF DENNISON, OHIO, ASSIGNOR TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAILWAY SIGNALING MECHANISM.

No. 910,911. Specification of Letters Patent. Patented Jan. 26, 1909.

Application filed September 23, 1907. Serial No. 394,067.

To all whom it may concern:

Be it known that I, LEVI H. CRAFT, of Dennison, Tuscarawas county, Ohio, have invented a new and useful Railway Signaling Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of signaling mechanism involving my invention, with one side of the casing removed; Fig. 2 is a horizontal section on the line II—II of Fig. 1; Fig. 3 is a vertical section on the line III—III of Fig. 2; and Fig. 4 is a side elevation, on a smaller scale, showing the semaphore arm.

The invention described herein relates to certain improvements in automatic signaling apparatus of the general class described and claimed in the patent to J. G. Schreuder No. 611,943, dated October 4th, 1898, in which the signal is set and operated by and in accordance with train movements.

The object of the present invention is to simplify the signal operating mechanism, and to provide operating mechanism of simple and compact form which can be applied directly to the semaphore shaft and inclosed within the casing attached to the semaphore post or support.

My invention is also designed to provide means whereby the semaphore arm may be locked in intermediate or cautionary position, so that a single arm may take the place of home and distant signals, the intermediate position of the single arm corresponding to the cautionary position of a distant signal.

With these objects in view my invention consists in the novel construction, arrangement, and combination of parts all substantially as hereinafter described and pointed out in the appended claims.

Referring to the accompanying drawings, the numeral 2 designates the upper portion of a semaphore post or support and 3 a suitable box or casing secured thereto and containing the operating mechanism for the semaphore arm.

4 designates the semaphore shaft, which is rotatably supported in the bearings 5 and to the outer projecting end portion of which is secured the semaphore arm 6.

7 designates a gear wheel loosely mounted on the semaphore shaft 4 and having worm teeth 8 on its outer periphery which are engaged by a worm 9 on a shaft 10 supported in bearings 11 in the lower portion of the casing. This worm wheel is driven by a motor 12 through the train 13 of reducing gears. Secured to one of the faces of the gear wheel 7 at intervals are laterally projecting stud rollers 14.

15 designates a slot arm which is rigidly secured to the semaphore shaft 4. 15′ designates electro-magnets, which are carried by the rear portion of said arm, and whose armature 16 has a latch engagement 17 with one end portion of a connecting rod 18 whose opposite end is connected to an angle lever 19 pivoted at 20. Connected to the third arm of this angle lever at 21 is a link 22 connected at its opposite end at 23 to one arm of an angle lever 24, pivoted at 25. These parts are all carried by the slot arm, as shown in Fig. 3. The link 22 is provided with a tail extension 22^a which is arranged to bear against the angle lever 19 to prevent free movement of the link 22 in one direction.

26 designates a latch arm, which is pivoted to the casing 3 at 27, and which is provided with an upper latch shoulder 28 and a lower latch shoulder 29. A pneumatic cushion, consisting of the two telescoping cylinders 30 and 31 is connected to the rear end of the slot arm by a rod 32, the purpose of this cushion being to steady the movement of the arm when its opposite end drops to set the signal to danger position.

31^a designates a safety rod forming a loose connection between the two cylinders 30 and 31 to prevent the cylinder from being pulled entirely out of the cylinder 31 by its engagement with the lug 31^b on the cylinder 31.

33 designates a circuit controlling device, which is fixed to the semaphore shaft 4 within the casing 3, and which has a plurality of contacts 34 engaged by the series of contact fingers 35. This circuit-controlling device corresponds generally to that shown and described in the patent to Schreuder above referred to, but instead of being separately mounted and actuated by an indirect connection with the signal mechanism, as in that patent, it is here secured directly to the semaphore shaft so as to be operated directly by the movement of such shaft. I have not herein shown the arrangement of track circuits, as these may be arranged in any suitable manner, as for instance in the said Schreuder patent. It will be understood that these circuits are completed through the

circuit-controlling device 33, and that the latter controls the circuit of the electro-magnets 15′ and of the motor 12.

37 designates a hinged door forming one side of the casing and permitting access to its interior.

38 is a lamp bracket attached to the casing, and 39 is a stop for the semaphore arm in its dropped position.

a, *b* and *c* designate the three lens holders on the semaphore arm, and which are designed to be successively brought opposite the lamp on the bracket 38 in the different positions of the arm 6 to indicate red, green and white lights.

While the semaphore arm is in its ninety degree or clear position, the operating parts are in the position shown in Fig. 3, the slot arm being locked in the position shown by the engagement of a pin 24^a on the angle lever 24, with the upper shoulder 28 of the latch arm 26, said latch lever 24 being held in this position by the attraction of the armature 16 by the magnets 15′.

Fig. 1 shows the semaphore arm in the intermediate or cautionary position, in which it is held by the engagement of the latch lever 24 with the lower latch shoulder 29 of the latch lever 26. The signal is released from the position shown in Figs. 1 and 3 by the breaking of the circuit of the electro-magnet 15′, which releases the armature 16 and thereby causes the disengagement of the pin 24^a from the latch arm 26. The weight of the signal then causes it to fall, carrying the slot arm with it.

When the semaphore arm is in its danger position, it remains there until the motor 12 is energized by the closing of the train-controlled circuit, which also closes the circuit of the electro-magnet 15′ and moves the latch lever 24 into position to be engaged by one of the stud rollers on the gear wheel 7. As the gear wheel 7 revolves, this engagement moves the slot arm upwardly, to carry the pin 24^a beyond the latch shoulder 28 to retain the arm in the cautionary position, the arm will be locked in this position, in the next movement of the motor it will be carried up to the clear position, as shown in Fig. 3.

In cases where it is desired to use both home and distant signals, it is obvious that the described mechanism might be duplicated for each signal.

The advantages of my invention consist in the simple character and compact arrangement of the operating mechanism, which can be applied directly to the semaphore arm, thus avoiding the complicated connections, the whole being capable of being inclosed within a casing of comparatively small size and supported by the semaphore post.

Various changes may be made in the details of construction and arrangement without departing from the spirit and scope of my invention, since

What I claim is:—

1. In signaling apparatus, a casing, a shaft journaled in said casing, a semaphore arm secured to the shaft, a gear wheel loosely mounted on said shaft and having its rim provided with a plurality of projecting studs, means for actuating the gear wheel, a slot arm secured to said shaft, a latch carried by the said arm and projecting into the path of the studs, a magnet also carried by the arm, actuating connections for the latch controlled by the magnet, and a latch provided with two shoulders pivoted to the casing and arranged to engage and support the slot arm in one of two different positions, substantially as described.

2. In signaling apparatus, a casing, a shaft journaled in said casing, a semaphore arm secured to the shaft, a gear wheel loosely mounted on said shaft and having its rim provided with a plurality of projecting studs, means for actuating the gear wheel, a slot arm secured to said shaft, a latch carried by the said arm and projecting into the path of the studs, a magnet also carried by the arm, actuating connections for the latch controlled by the magnet, and a latch provided with two shoulders pivoted to the casing and arranged to engage and support the slot arm in one of two different positions, together with a cushioning or motion-retarding device connected to said arm and also to the casing, substantially as described.

In testimony whereof, I have hereunto set my hand.

LEVI H. CRAFT.

Witnesses:
ROBERT B. ENGLISH,
THOS. WRIGHT.