J. D. TAYLOR.

RAILWAY SIGNALING MECHANISM.

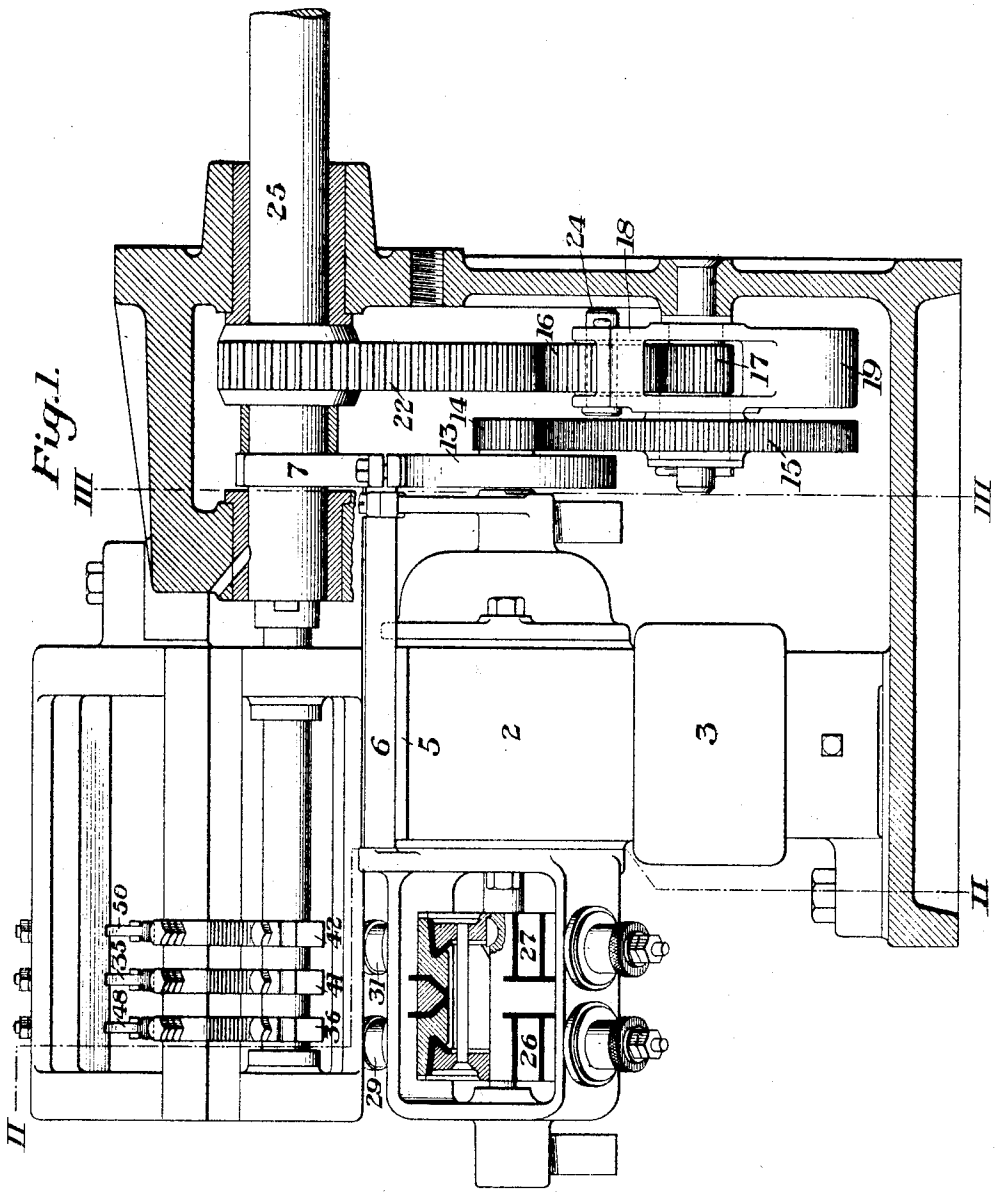
APPLICATION FILED MAY 26, 1910.

1,036,373.

Patented Aug. 20, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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Fig. 3.

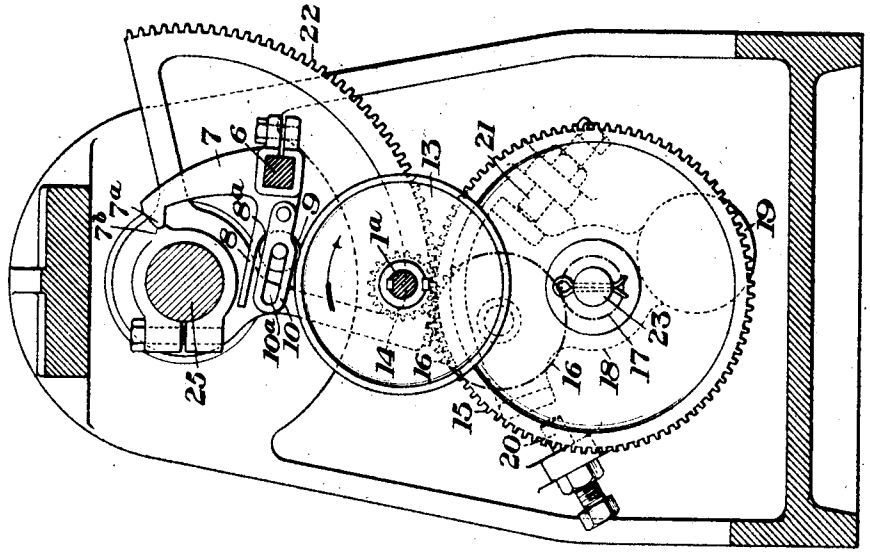
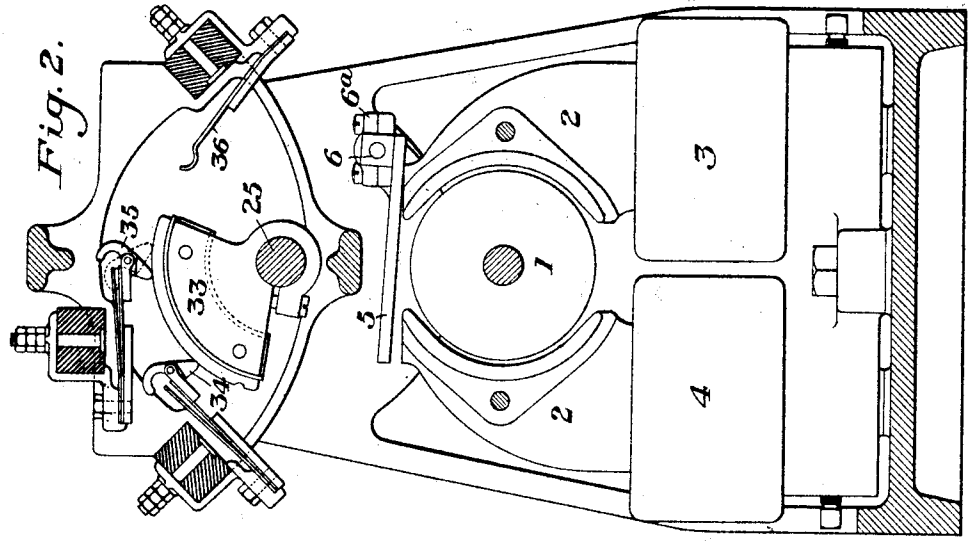


Fig. 2.



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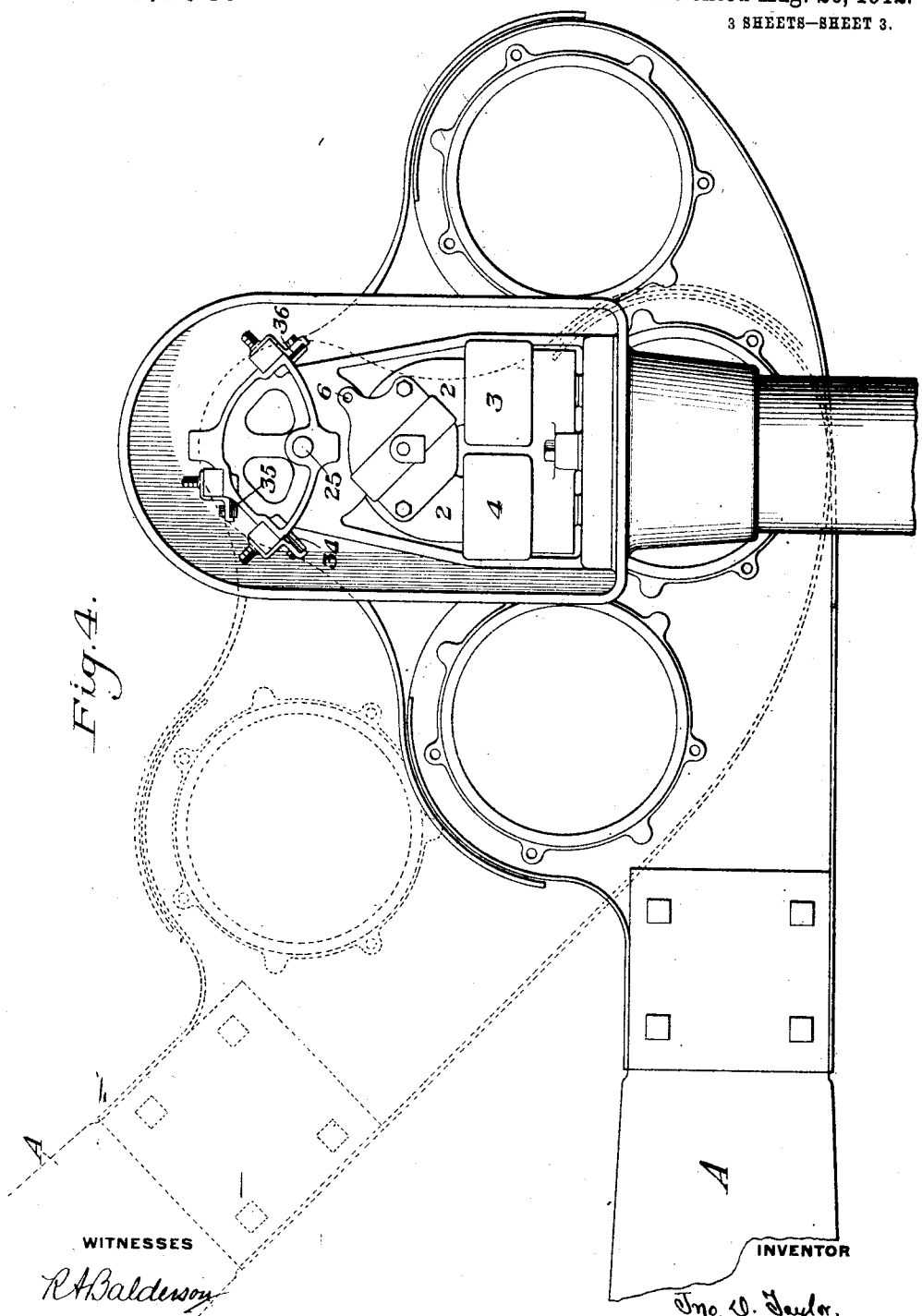

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN D. TAYLOR, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAILWAY SIGNALING MECHANISM.

1,036,373. Specification of Letters Patent. Patented Aug. 20, 1912.

Application filed May 26, 1910. Serial No. 563,608.

To all whom it may concern:

Be it known that I, JOHN D. TAYLOR, of Edgewood Park, Allegheny county, Pennsylvania, 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, partly in vertical section of signal actuating mechanism embodying my invention, the outer casing being removed; Fig. 2 is a section on the irregular line II—II of Fig. 1; Fig. 3 is a section on the line III—III of Fig. 1; Fig. 4 is an elevation showing the signal actuating mechanism in position on the upper end of a pole, a portion of the signal arm being shown in danger position in full lines and in cautionary position in dotted lines.

My invention has relation to railway signaling mechanism, and is designed to provide signal-actuating means of simple and efficient character, in which many of the parts heretofore required in apparatus of this kind, such as the holding-clear magnet and dash-pot, or other means for retarding the fall of the counterweight when the signal is going to the normal or danger position, may be omitted, thereby largely reducing the cost as well as the chances for disarrangement of the parts and failure to operate properly.

In accordance with my invention, I utilize the magnetism produced by the field-winding of the signal actuating motor for the purpose of holding the signal in its clear position.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown the preferred embodiment thereof, and which will now be described, it being premised that various changes may be made in the construction and arrangement of the several parts by those skilled in the art without departing from the spirit and scope of my invention.

Referring to the accompanying drawings, the numeral 1 designates the armature of a signal actuating motor, 2 the pole pieces thereof, and 3 and 4 the field energizing coils. The motor is provided with an additional armature 5, which is preferably in the shape of a flat piece of iron bridging the two pole pieces 2 as best shown in Fig. 2, and is connected at one end to a shaft 6, which is journaled in bearings 6^a fastened to the pole pieces of the motor. The shaft 6 carries a crank 7 having an arm 8 extending over a brake wheel 13, which is keyed to the armature shaft 1^a. Between the arm 8 and the brake wheel 13 is placed a roller 9, which is held in place by the stirrup 10. When the roller is in the position shown in Fig. 3, it is in a position to transmit the pressure from the lever arm 8 to the brake wheel 13, and thus form a friction brake to hold the signal arm in the clear position. The pressure on the roller is produced by the attraction between the armature 5 and the pole pieces 2 of the motor. In this position, when the field coils are energized, the pressure on the roller 9 prevents rotation of the brake wheel 13 in the direction of the arrow, and thereby prevents rotation of all the connected parts, holding the signal in the clear position. The roller is prevented from moving by a shoulder 8^a on the arm 8. The brake wheel 13 is, however, free to turn in the opposite direction, because then, the roller 9 will move freely toward the opposite end of the slot 10^a in the stirrup 10 pivoted to the crank 7, at which point the distance between the arm 8 and the brake wheel 13 is too great to cause any friction between said wheel and the roller. The upper arm of the crank 7 has a projecting lug 7^a, which engages with a cam projection 7^b carried by the signal shaft 25, when the signal is in normal position. This is for the purpose of holding the pressure off the roller 9 and thereby permitting the motor to run in the direction indicated by the arrow, for the purpose of producing the indicating current which is used in connection with an interlocking mechanism. In any other position of the signal, the arm 8 is free to press on the roller 9. In clearing the signal, the motor runs in a direction opposite to that indicated by the arrow, and in this direction the brake offers no resistance whatever to the rotation. The signal arm A (Fig. 4), which is attached to the end of the shaft 25, moves upwardly from the horizontal danger position shown in full lines in Fig. 4 to the oblique cautionary position shown in dotted lines in said figure, and in its clear position points upwardly in a vertical direction.

The armature shaft 1^a carries a pinion 14, which meshes with a gear 15 keyed to the hub of a pinion 17. The pinion 17 is arranged to turn loosely on a stud 23. Mounted loosely on the hub of the pinion 17 is a frame 18; and pivoted in the fork of this frame is a pinion 16, which engages the pinion 17, and also the segmental gear 22 in certain positions of the frame 18, said gear 22 being rigidly secured to the signal shaft 25. Attached to the opposite end of the frame from the pinion 16 is a counterweight 19 which is sufficient to balance the weight of the pinion 16. When the motor is running in the direction of clearing the signal, the frame 18 is turned by the friction between it and the hub of the pinion 17 so as to cause the engagement of the pinion 16 with the segmental gear 22. When the motor turns in the opposite direction, as it does when generating the indication current, the pinion 16 is moved out of engagement with the segmental gear 22, and no resistance is offered to its rotation and no effect is produced on the signal blade. The frame 18 is limited in its movement in both directions by the respective stops 20 and 21, the stop 21 being adjusted to allow the proper mesh of the pinion 16 and the segmental gear 22, while the stop 20 is set at such distance that the pinion 16 may be entirely clear of the gear 22. So long as the motor is running in the direction to clear the signal, and while the signal is returning to normal position and is driving the motor backward, the pinion 16 and gear 22 remain in mesh; but as soon as the signal reaches the normal position and rests on the limiting stop provided for the purpose, the momentum of the motor armature, if it is sufficient to still continue the rotation, will cause the disengagement of the pinion 16 with the gear 22 and thus prevent any shock to the mechanism.

The friction between the frame 18 and the hub of the pinion 17, on which it is pivoted, is not depended upon to hold the pinion 16 in mesh with the gear 22. The friction is only required to cause the pinion to come into mesh with the gear, after which the force applied by the motor in clearing the signal will hold them in mesh. When the signal is going toward the danger position, force is exerted by the signal counterweight, which drives the gearing and motor backward. This force also tends to hold the gears in mesh. The force exerted by the motor, when moving the signal toward the clear position, has the same effect on the gear as the force exerted by the counterweight in rotating the train of gearing in the opposite direction.

For use in connection with interlocking apparatus presently described, the motor is provided with two commutators 26 and 27, which are connected to two independent windings on the armature. These two sets of windings are coupled in series during the time that the motor is acting simply as a motor and while clearing the signal. When the motor is being used for developing the indication current, it is driven through one set of windings only, while the other set acts as a generator to produce the indication current. This is more fully described in my Patent No. 916,220, of March 23rd, 1909, and to which reference may be made for a more complete description.

By utilizing the motor fields for holding the signal in the clear position, I am able to do away with the use of the holding clear magnet, dash-pot, and connected parts usually required for this purpose, and greatly simplify the apparatus.

The floating gearing described also forms means of simple, novel and efficient character for disengaging the motor from the signal.

It will be obvious that the invention is susceptible of wide modifications and changes by those skilled in the art, with respect to the construction and arrangement of the various parts, this being particularly true of the parts shown diagrammatically.

What I claim is:—

1. In signal actuating mechanism, a motor for clearing the signal, means for maintaining the poles of the motor energized while the signal is in clear position, and means actuated by such pole pieces for holding the signal in clear position; substantially as described.

2. In railway signaling mechanism, a motor for clearing the signal, means for maintaining the pole pieces of the motor energized while the signal is in clear position, a supplemental armature, and a brake device controlled by said armature for holding the signal in clear position; substantially as described.

3. In combination, a railway signaling mechanism having a movable signal arm, a signal actuating motor having a supplemental armature, a brake device controlled by said armature and acting upon the motor to hold the signal arm in a predetermined position when the supplemental armature is attracted by the energized field magnet of the motor; substantially as described.

4. In railway signaling mechanism, a signal arm, a motor for moving the arm to clear position, and having means for maintaining the energization of its field poles, a supplemental armature coöperating with the field poles, a brake device arranged to act upon the main armature of the motor, and connections between said brake device and the supplemental armature; substantially as described.

5. In signal actuating mechanism, the combination with a signal, of a motor for

clearing the same, a gearing between the motor armature and the signal shaft, the motor having a supplemental armature, a brake device for said gearing, and an actuating connection between the brake device and the supplemental armature to apply the brake when the supplemental armature is attracted; together with means for energizing the field coils of the motor to operate said armature to effect the holding action of the said device substantially as described.

6. In signal actuating mechanism, the combination with a signal, of a motor for clearing the same, a gearing between the motor armature and the signal shaft, the motor having a supplemental armature, a brake device for said gearing, an actuating connection between the brake device and the supplemental armature, and means operated by the signal for releasing the action of the brake device; substantially as described.

7. In signal actuating mechanism, a signal arm, a motor for actuating said arm in one direction, said motor having a supplemental armature, a brake device for the motor connected to the supplemental armature, said brake device being effective when the supplemental armature is attracted by the motor field magnet to hold the signal in a predetermined position by holding the motor against rotation in one direction while permitting free rotation in the opposite direction; substantially as described.

8. In signal actuating mechanism, a signal arm, a motor for actuating said arm in one direction, said motor having a supplemental armature, a brake device for the motor having actuating connections with the supplemental armature, said brake device being arranged to hold the motor against rotation in one direction in a predetermined position of the signal arm but to permit the motor to rotate in the opposite direction, and means controlled by the movement of the signal for releasing the brake device; substantially as described.

9. In signal actuating mechanism, a signal shaft having a gear thereon, an actuating motor, a member pivoted on a shaft connected to the motor, a gear journaled to the pivoted member and meshing with a pinion on the pivotal shaft, there being frictional engagement between the pivoted member and pivotal shaft to cause the two gears to come into engagement when the motor moves in a direction to clear the signal, and the tangential force between the gears causing their disengagement when the motor is driven in the opposite direction by current or momentum; substantially as described.

In testimony whereof, I have hereunto set my hand.

JOHN D. TAYLOR.

Witnesses:
C. O. HARRINGTON, Jr.,
HAROLD MCCREADY.