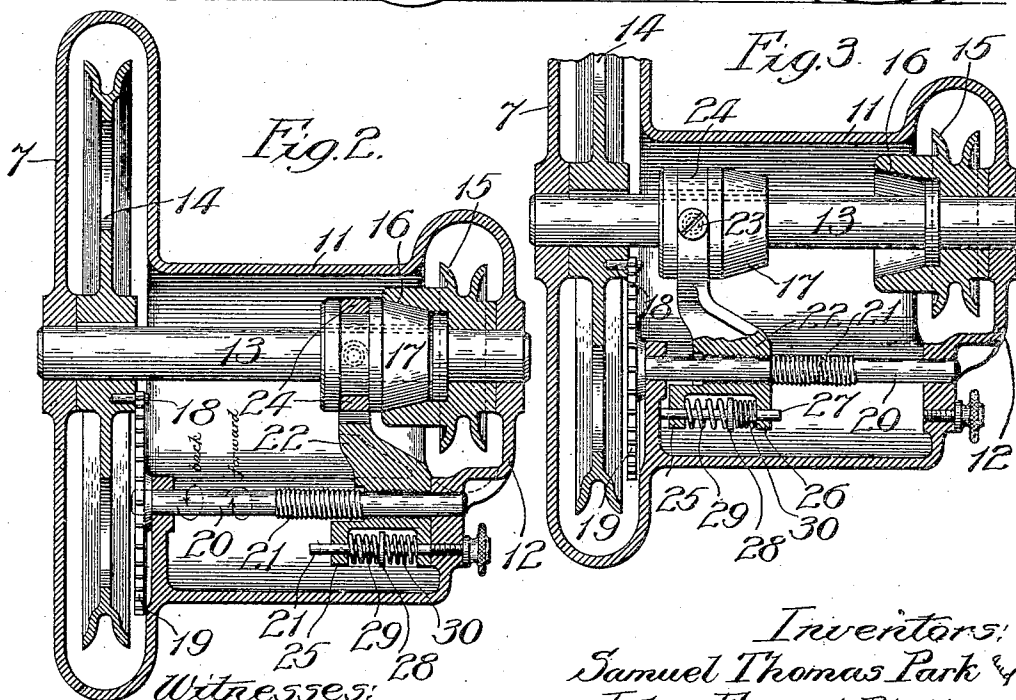
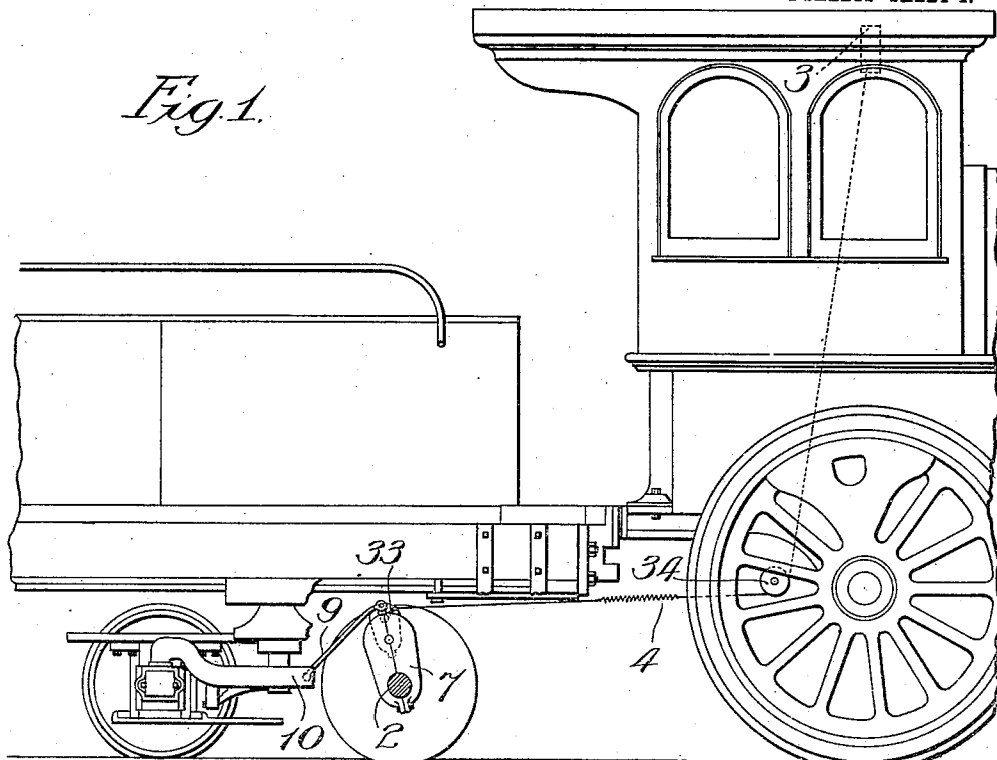


S. T. PARK & J. E. PHILLIPS.
GEARING FOR LOCOMOTIVE RECORDING INSTRUMENTS.
APPLICATION FILED DEC. 21, 1908.

935,682.

Patented Oct. 5, 1909.

2 SHEETS—SHEET 1.

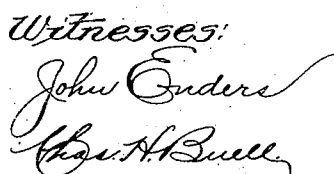


Witnesses:
John Cuders
Chas. H. Bull.

Inventors:
Samuel Thomas Park &
John Emmet Phillips.
By Sheridan & Wilkinson
Attys

935,682.

2 SHEETS—SHEET 2.



4
Inventors:
Samuel Thomas Park and
John Emmet Phillips.
By Sheridan & Wilkinson
Attys. 44

UNITED STATES PATENT OFFICE.

SAMUEL THOMAS PARK AND JOHN EMMET PHILLIPS, OF DANVILLE, ILLINOIS, ASSIGNORS TO LOCOMOTIVE RECORDING DYNAMOMETER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

GEARING FOR LOCOMOTIVE RECORDING INSTRUMENTS.

935,682.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed December 21, 1908. Serial No. 468,511.

To all whom it may concern:

Be it known that we, SAMUEL THOMAS PARK and JOHN EMMET PHILLIPS, citizens of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Gearing for Locomotive Recording Instruments, of which the following is a specification.

The object of our invention is to provide efficient gearing for use in actuating the paper feeding mechanism and other parts of a locomotive recording instrument by means of power derived from one of the track wheels. In devices of this type, it is desirable to record the tractive force exerted by the locomotive, the steam pressure, the air pressure in the brake system, etc., or any one or more of these forces upon a sheet of paper which moves at a speed directly proportionate to the speed of the locomotive. In this manner the information derived from any point in the record curves will appear in its proper relation to the part of the track over which the locomotive was passing at the time the information was recorded. Such relation may be established by previously printing upon the record sheet a profile of the road, a line indicating track curvature, and lines representing any other landmarks or characteristics desired, such profiles and other lines being made upon a ratio to the length of the road identical with the ratio between the speed of movement of the record sheet and the locomotive. If desired, the profile line, line representing track curvature and other data may be made upon a separate transparent sheet to be superimposed over the record sheet after it is taken from the recording instrument. It frequently happens, however, that owing to the exigencies of traffic a train cannot proceed directly to its destination, but may frequently be obliged to move backward upon switches and for other purposes. If the mechanism is so arranged that upon backward movement of the train no movement whatever is imparted to the record sheet, difficulty arises from the fact that the record sheet begins to move immediately upon resumption of the forward movement of the train. If this were permitted to take place, the relation between the data recorded while the train was in transit, would not bear a

proper relation to the profile line, the line representing curvature, and other permanent data previously printed upon the record sheet or upon a separate transparent datum sheet.

It is the purpose of our invention to provide means whereby when a train moves backward the paper feeding movement will cease, and will not be resumed until the train is moved forward to the point where the backward movement commenced.

The objects of our invention will more clearly appear from the description and claims, taken in connection with the drawings, in which—

Figure 1 is a side view of part of a locomotive and tender equipped with our invention. Fig. 2 is a sectional view of the gearing and automatic clutch mechanism, the section being on line 2, 2 of Fig. 5. Fig. 3 is a view similar to Fig. 2, but showing the parts in a different position. Fig. 4 is a sectional view on the line 4, 4 of Fig. 5, and Fig. 5 is a sectional view on the line 5, 5 of Fig. 4.

A split pulley 1, the sections of which are clamped around one of the track wheel axles, in the present instance axle 2 of the tender, is the original source of power for the paper feeding mechanism forming part of the recording instrument 3, which is mounted at some convenient point in the locomotive cab. The details of the recording instrument and of the paper feeding mechanism therein need not be described in this application for the reason that such details form no part of the invention herein claimed. It is sufficient to state that movement is communicated to the paper feeding mechanism and to such other parts of the recording instrument as derive power from the track wheel axle by means of a succession of impulses or pulls upon the flexible cord 4 which extends from the gearing mounted upon the track wheel axle 2 to said recording instrument 3. Any suitable pawl and ratchet or other mechanism may be adopted for the purpose of transforming the impulses of the flexible cord 4 into the rotary movement necessary for winding the paper web. The sections of the split pulley 1 are clamped together by means of bolts 5. The internal bore of the pulley, however, is shown as somewhat larger than the diameter of the axle 2, and the pulley is

centered on the axle and clamped thereto by means of screws 6. Surrounding the pulley 1 and other members of the train of gearing is a casing 7 formed in two parts and provided with bolts 8 for the purpose of clamping the same around the track wheel axle 2 and the attached gearing. From the upper part of the casing 7 a link 9 extends to a fixed part of the vehicle, in the present instance the side frame 10 of the truck. The link 9 is pivoted at its ends to the side frame 10 and the casing 7, the purpose of this link being to hold the casing 7 and inclosed gearing against rotation around the axle 2, while at the same time avoiding a rigid connection which might lead to strains due to the movement of the vehicle upon its springs or other causes. The casing 7 is formed with an offset part 11 at the end of which is an extension 12. A shaft 13 revolvably mounted in the ends of the offset 11 carries a pulley 14, the latter being keyed to the shaft 13. Rotatably mounted upon the end of the shaft 13 opposite the pulley 14 is a second pulley 15 provided with a conical recess 16 which forms one member of a clutch. Splined upon the shaft 13 is the other conical member 17 of the clutch, the arrangement being such that when the parts are in the position shown in Fig. 2 the rotation of the shaft 13 will be communicated to the pulley 15. The pulleys 1 and 14 are belted together, the belt being omitted from the drawings for the purpose of clearness.

We will next proceed to describe the mechanism whereby the clutch members 16 and 17 are thrown out of engagement when the locomotive moves backward, and are reengaged only after the locomotive has moved forward to the point where the backward movement commenced.

The hub of the pulley 14 is provided with a pin 18, which engages one of the teeth of the star-wheel 19 upon each rotation of the pulley 14, thus imparting a step by step movement to said star-wheel. The star-wheel 19 is fixed to a shaft 20 journaled in the extension 11 of the casing 7. Intermediate its length the shaft 20 is provided with a screw-thread 21, the end portions of said shaft 20 being smooth and unthreaded. A nut or carrier 22 is provided with an interiorly screw-threaded aperture, and the thickness of the carrier 22 at the point where the screw threaded aperture is located is such that there is room upon the smooth end portions of the shaft 20 for said carrier to rest with its screw-threaded aperture out of engagement with the screw-threaded central portion 21 of said shaft. The end of the carrier 22 is forked as shown in Fig. 5 and trunnions 23 therein engage a ring 24, shown in Figs. 2 and 3, which rotatably embraces the clutch member 17. The end of the carrier 22 beyond the shaft 20 is formed with

lugs 25—26 spaced apart in the direction of the length of the shaft 20. A spindle 27 is slidably fitted to apertures in the lugs 25—26. Near its center the spindle 27 is formed with an abutment 28 rigidly secured thereto, and springs 29 and 30 occupy the spaces between the abutment 28 and the lugs 25 and 26, respectively. Upon movement of the vehicle forward the shaft 20 will be rotated in clockwise direction as viewed from the right of Fig. 2. If the carrier 22 occupies the position shown in Fig. 2 the rotation of the shaft 20 will have no effect thereon as such rotation is not in the right direction to engage the screw-thread 21 with the screw-threaded apertures of the carrier. If, however, the carrier occupies the position shown in Fig. 3, or any intermediate position upon the screw-threaded part 21 of the shaft 20 at the time the vehicle moves forward, the screw-threads will engage and the carrier will be moved to the right as viewed in Fig. 3 until the clutch member 17 is carried into engagement with the clutch member 16 of the pulley 15, such movement ceasing when the carrier has moved to the extreme position shown in Fig. 2 where the carrier has passed beyond the screw-thread 21. The effect of the engagement so caused between the clutch members 17 and 16 will be to impart rotation to the pulley 15. The complete chain of gearing extends from the axle 2 through the pulley 1 and connecting belt to the pulley 14, then to the shaft 13, clutch members 17 and 16 to the pulley 15, thence by means of a belt to the pulley 30. As shown in Fig. 4 the shaft 31 of the pulley 30 extends through the casing and upon the exterior thereof is provided with a crank arm 32 and crank pin 33. The cord 4 is connected to the crank pin 33, as shown in Fig. 1, and through this connection the desired impulses are communicated to the mechanism upon the locomotive. The cord 4 is shown in the present instance as passing around a pulley 34 mounted upon a fixed part of the locomotive and thence upward to the recording instrument 3.

Assuming that the parts are in the position shown in Fig. 2 and that the locomotive is reversed, the backward movement of the locomotive reverses the direction of rotation of the shaft 20, causing it to move in counter clockwise direction as viewed from the right of Fig. 2. Rotation of the shaft 20 in this direction causes the screw-thread 21 to engage the screw-threaded aperture in the carrier 22 and to move the same to the left from the position shown in Fig. 2, thus disengaging the clutch members, and moving the carrier to the left a distance proportionate to the backward movement of the locomotive. Upon moving forward again the locomotive will again reverse the direction of movement of the shaft 20 and move the car-

rier 22 to the right, and as the movement of the carrier to the left caused by the backward movement of the locomotive has been directly proportionate to the amount of such backward movement, the carrier 22 upon resumption of forward movement will carry the clutch members 16 and 17 into engagement at the precise point where the backward movement commenced.

10 The purpose of the springs 29 and 30 and spindle 27 is to cause an initial pressure between the screw-threads in the carrier 22 and the screw-thread 21 when the carrier is at either of its extreme limits of movement, as shown in Figs. 2 and 3. The length of the spindle 27 and the tension of the springs 29 and 30 are so proportioned that when not under restraint the spindle 27 will project beyond the lugs 25 and 26. When the carrier is moved to the position shown in Fig. 2, therefore, the spindle 27 will be forcibly moved to the left from its position of equilibrium, thus compressing the spring 29, and the reaction of the spring 29 upon the lug 25 tends to force the carrier 22 to the left, thus insuring prompt engagement of the screw-thread 21 with the screw-threaded aperture in the carrier 22 whenever the shaft is rotated in the right direction to bring about such engagement. When the carrier 22 has been carried to its extreme left-hand position, as shown in Fig. 3, the spindle 27 abuts against the other side of the casing, thus compressing the spring 30, and the reaction of spring 30 against the lug 36 tends in like manner to move the carrier to the right, thus insuring engagement between the screw-threads when the shaft 20 is rotated in the direction to cause such engagement.

In the mechanism illustrated the amount of rotation imparted to the shaft 20 through engagement of the pin 18 with the star-wheel 19, and the pitch of the screw-thread 21 are such that the locomotive may be moved backward a distance of three miles before the parts reach the position shown in Fig. 2. Of course any backward movement after the parts have reached the position shown in Fig. 3 would not be corrected by the mechanism illustrated, but by a suitable adjustment of the gearing. The amount of backward movement allowed for may be increased.

We would have it understood that we do not desire to limit ourselves to the precise construction and arrangement of parts shown in the drawings as herein described, as various modifications or variations may be made without departing from our original invention.

What we claim is:

1. In a device of the class described, a driving shaft, a driven shaft, means for communicating movement from the driving

shaft to the driven shaft when the driving shaft rotates in one direction, means for interrupting such communication of movement when the direction of rotation of said driving shaft is reversed and for preventing such communication of movement from being resumed until said driving shaft is again reversed and rotated in said first named direction to an extent equal to its reverse rotation.

2. In a device of the class described, a driving shaft, a driven shaft, a clutch between said driving and driven shaft, a screw threaded member adapted to engage one member of said clutch, and means for rotating said screw threaded member.

3. In a device of the class described, a driving shaft, a driven shaft, a clutch between said shafts, one member of said clutch being provided with a screw thread, a second screw threaded member, a spring pressing said screw threaded members into engagement, and speed reducing gearing between said driving shaft and said second screw threaded member.

4. In a device of the class described, a driving shaft, a driven shaft, a clutch between said shafts, one member of said clutch being provided with a screw thread, a second screw threaded member, a spring pressing said screw threaded members into engagement, a pin secured to said driving shaft, and an intermeshing star wheel upon said second screw threaded member.

5. In a device of the class described, a driving shaft, a driven shaft, a clutch between said shafts, means for moving one member of said clutch away from the other through rotation of said driving shaft in one direction, means for moving said first named clutch member toward the other upon reverse rotation of said driving shaft, and means for limiting the movement of said first named clutch member away from the other member.

6. In a device of the class described, a driving shaft, a casing, a driven shaft, clutch members upon said driving and driven members, said driving shaft clutch member being provided with a screw threaded aperture, a rotatable spindle having a screw threaded section intermediate its ends, reduction gearing between said driving shaft and said spindle, a forked extension upon said driving shaft clutch member, a spindle slidably fitted to apertures in said forked extension, a fixed abutment upon said spindle between the prongs of said forked extension, springs between said abutment and each of said prongs, said springs and spindle being so proportioned that the ends of said spindle normally project beyond said prongs to a position where they may contact said casing.

7. In combination with a railway locomotive and tender, a driving shaft geared to

one of the track wheel axles, a driven shaft, a clutch between said shafts, one member of said clutch being provided with a screw thread, a second screw threaded member, a
 5 spring pressing said screw threaded members into engagement, and speed reducing gearing between said driving shaft and said second screw threaded member.

8. In combination with a railway locomotive and tender, a driving shaft geared to one of the track wheel axles, a driven shaft, a clutch between said shafts, one member of said clutch being provided with a screw thread, a second screw threaded member, a
 15 spring pressing said screw threaded members into engagement, a pin secured to said driving shaft, and an intermeshing star wheel upon said second screw threaded member.

20 9. In combination with a railway locomotive and tender, a driving shaft geared to one of the track wheel axles, a casing, a driven shaft, clutch members upon said driving and driven members, said driving shaft
 25 clutch member being provided with a screw

threaded aperture, a rotatable spindle having a screw threaded section intermediate its ends, reduction gearing between said driving shaft and said spindle, a forked extension upon said driving shaft clutch member, 30 a spindle slidably fitted to apertures in said forked extension, a fixed abutment upon said spindle between the prongs of said forked extension, springs between said abutment and each of said prongs, said springs and 35 spindle being so proportioned that the ends of said spindle normally project beyond said prongs to a position where they may contact said casing.

In testimony whereof, we have subscribed 40 our names.

SAMUEL THOMAS PARK.
 JOHN EMMET PHILLIPS.

Witnesses for Samuel Thomas Park:

J. H. BEGGS,
 RICHARD F. LLOYD.

Witnesses for John Emmet Phillips:

CARL F. ASHTON,
 ARTHUR E. CUTLER.