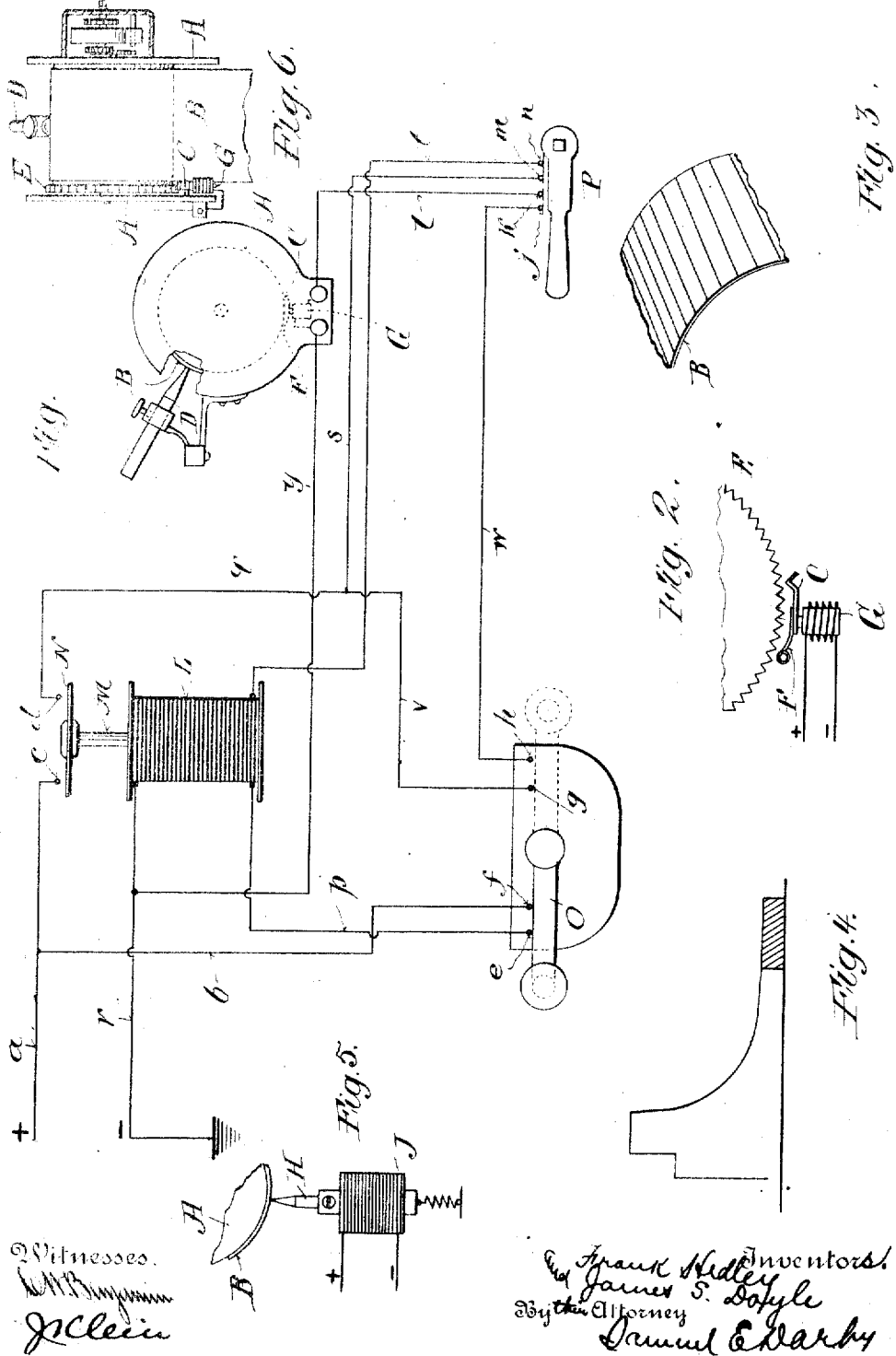


F. HEDLEY & J. S. DOYLE,
COASTING RECORD DEVICE.
APPLICATION FILED JAN. 18, 1909.

940,810.

Patented Nov. 23, 1909.



UNITED STATES PATENT OFFICE.

FRANK HEDLEY AND JAMES S. DOYLE, OF NEW YORK, N. Y.

COASTING-RECORD DEVICE.

940,810.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed January 18, 1909. Serial No. 472,842.

To all whom it may concern:

Be it known that we, FRANK HEDLEY and JAMES S. DOYLE, both citizens of the United States, and residents of the city, county, and State of New York, have made a certain new and useful Invention in Coasting-Record Devices, of which the following is a specification.

This invention relates to coasting record devices for use in connection with the operation of street cars, railway trains or the like.

The object of the invention is to provide means for recording the coasting time or distance of street or other cars, railway trains or the like, that is, the time consumed or distance covered by a street car, train or the like when running with the motive power shut off, as, for instance in coming to a street crossing, or station, thereby indicating the saving effected in the amount of current or power consumption required in the operation of the train.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawing, and finally pointed out in the appended claims.

In the drawing,—Figure 1 is a view in diagram showing an arrangement of coasting record device embodying the principles of our invention. Fig. 2 is a broken detail view showing a form of record controlling release mechanism employed in connection with our invention. Fig. 3 is a detail view of a record sheet. Fig. 4 is a diagram of a power or current curve showing graphically the portion of operating current, the saving of which is to be recorded. Fig. 5 is a view similar to Fig. 2 showing another form of recording mechanism included within the scope of our invention. Fig. 6 is a detail view in side elevation, parts in section, showing the record moving mechanism.

In the practical operation of street or other cars, railway trains or similar or other devices, the operating power is cut off from the driving motor before the car, train or the like reaches the point where a stop is to be made. In such cases the headway or momentum of the car or train carries the same along until the brakes are finally applied.

This movement of the car or train during the time the power is cut off is commonly called "coasting", and the time consumed in coasting represents a saving, during such interval of time, of current or other power employed to operate the train or car. Heretofore, so far as we are aware, no effort has ever been made to keep a record of the saving of power effected in this manner, the motormen or engineers, without special incentive, merely exercising their individual discretion as to when to shut off the power in approaching a stopping point, and without regard to the idea of effecting a measurable saving of power or current with prearranged calculation. The result has been in practice, that one motorman will shut off his power at one point and another will shut off the power at another point, with total lack of system, and, frequently without effecting the degree of saving of power or current consumption that otherwise might be possible.

In accordance with our invention we propose to employ a recording apparatus, controlled conjointly by the power controller and the brake controller, whereby the "coasting" record of the car or train may be made. This record may be of the time consumed during the "coasting" travel of the train or car, or it may be of the distance covered during such coasting travel, or it may be of some other element which may be made to calculate the saving of current or other power by reason of the "coasting" travel of the car or train.

With such a record as above indicated, an incentive on the part of motormen or engineers to systematically control their cars or trains with reference to the "coasting" travel thereof, in such manner as to effect the greatest amount of saving of operating power or current, thereby reducing the cost of operation of the system, may be afforded by offering to such motormen or engineers, as a bonus, a percentage of the saving, thereby effected, in the power or current consumption. Any disposition on the part of the motorman or engineer to build up a large "coasting" record at the expense of the time schedule for the operation of his car or train may be prevented or controlled by a strict maintenance of the time schedule, or a proportionate deduction from the "coasting" bonus by reason of any loss from the

time schedule. Of course other methods of management based on the records of "coasting" travel of the car or train secured by the operation of our invention might readily occur to those familiar with the conditions and circumstances of street or other railway management.

From the foregoing description it will be seen that, in its broadest scope our invention contemplates the provision of means controlled conjointly by the motor and brake controllers for making a record of the "coasting" travel of cars, trains or other moving bodies.

The specific structure of the record apparatus is immaterial. In one form of arrangement, as exemplifying the principles of our invention, we employ a cylinder, indicated at A, upon which may be carried a record sheet B, suitably prepared and ruled. This record sheet is merely indicated diagrammatically in Fig. 1. A pencil or other marker, indicated at D, may be arranged to bear upon the record sheet carried by the cylinder A. This cylinder may be driven by any suitably arranged motor, such, for instance as a clock spring motor, indicated at S. Under normal running conditions of the train the record cylinder driving mechanism is locked against operation by a releasable and controllable locking mechanism. One form of controllable locking mechanism which is of simple construction is shown wherein a locking dog C, coöperates with a ratchet disk E, the latter forming part of the cylinder driving mechanism. This dog may be normally held in locking engagement with the ratchet disk E, in any convenient manner, as, for instance, by means of a spring F, and the release of the dog from engagement with the ratchet disk may be effected by any suitable means controlled by the proper conjoint manipulation of the motor controller and brake controller.

In one form illustrated in the drawing the release of the locking dog is effected by means of a magnet G, the circuit of which is controlled by the main motor controller and the brake controller conjointly as will be explained hereinafter. In this form of application of our invention it will be observed that the record cylinder is held against rotation during the normal running of the car or train under its usual power. As the car or train approaches a station or stopping point the power is cut off from the main motor and the car or train continues its travel under its gathered headway or momentum. The cutting off of the supply of motive power effects a release of the record cylinder operating mechanism, as, for instance, by completing the circuit of magnet G, and consequently the pencil or other marker D, effects a record of the "coasting" time or distance of the car or train, and

when finally the brakes are applied to stop the car or train the record cylinder is again arrested, and the time consumed, or the distance covered by the train or car in the interval between the shutting off of the motive power and the application of the brakes, marks the saving effected in power consumption.

In Fig. 5 we have indicated another arrangement embodying the principles of our invention wherein instead of starting and stopping the record cylinder, the pencil or other marking device H, is automatically moved into and out of marking position with reference to the record sheet. This result is accomplished in this instance by means of a solenoid J, the core of which carries the pencil or other marker, and the circuit of the coil of which is controlled conjointly by the main motor controller and the brake controller.

It is obvious that many other specifically different arrangements of recording mechanism may be employed and still fall within the spirit and scope of our invention as defined in the claims.

We will now describe an arrangement for effecting the control of the recording apparatus through the conjoint operation of the main motor controller and the brake controller and embodying the principles of our invention.

Reference sign L, designates a solenoid, the core M, of which, operates a bridging contact piece N, arranged to open and to close a circuit between the contact points *c, d*.

The main motor controller handle is designated by reference sign O, and is arranged, when in one position to close circuit between contacts *e, f*, and when in another position to close circuit connection between contacts *g, h*.

The brake controller handle is indicated by the reference sign P, and is arranged when in "off" or release position to close circuit connection between contacts *j, k*, and between contacts *m, n*.

The motor controller handle O, is shown in full lines in position to close circuit connection between contacts *e, f*, and to open the circuit between contacts *g, h*, and the brake controller handle P, is shown in "off" or release position, thereby completing the circuits between contacts *j, k*, and between *m, n*. Under these conditions, circuit is completed from any suitable or convenient source through main supply wire *a*, wire *b*, contact *f*, handle O, contact *e*, wire *p*, coil L, and return or ground wire *r*, thereby energizing coil L, and causing the contact strip N, to close the circuit between contacts *c, d*. Thereupon another circuit through the coil L, is completed as follows:—from main supply wire *a*, through contact *c*, contact *d*,

wire *g*, wire *s*, contact *m*, brake control handle *P*, contact *n*, wire *t*, coil *L*, and to return or ground wire *r*. The completion of this circuit supplies energizing current to coil *L*, even though the circuit through contacts *e*, *f*, above traced, is broken by the manipulation or movement of the main control handle *O*. In other words the movement of the handle *O* into the position indicated in full lines serves to establish a preliminary energizing circuit for the coil *L*, but once this coil is energized by the completion of this preliminary circuit, the resulting actuation of the contact strip *N*, establishes another circuit through the brake control handle and the coil *L*, energized without regard to the main motor control handle *O*. Ordinarily the handle *O* is moved into position to close circuit between contacts *e*, *f*, preliminary to the movement of said handle into complete "off" position to shut off power from the main motor. This handle *O*, is then moved into its "off" position as indicated in dotted lines thereby closing circuit between contacts *g*, *h*. Thereupon a circuit is completed through the record controlling mechanism as follows:— from wire *a*, through contacts *c*, *d*, wire *q*, wire *r*, contact *g*, handle *O*, contact *h*, wire *w*, contact *j*, handle *P*, contact *k*, wire *l*, the record controlling device, as coil *G*, or coil *J*, wire *y*, to return or ground wire *r*. The completion of this circuit results in the proper actuation of the recording devices to effect the desired record, and since this operation is inaugurated coincidently with the shutting off of power from the main motor, and continues as long as the brake controlling handle is in full release position it results that the record made is of the "coasting" travel of the car or train and may be, as above explained, either the distance, or the time or other element of such travel, as may be desired, in order to furnish a basis for a calculation of the power saving and economy of operation effected by such "coasting" travel. By the movement of the brake control handle *P*, to effect an application of the brakes the circuits of both the recording mechanism and also of the control magnet coil *L*, are broken and the recording operation is arrested. This, of course, marks the end of the free coasting travel of the car or train, and the apparatus is placed in condition for the next operation.

Having now set forth the object and nature of our invention, and an arrangement embodying the principles thereof, and having explained the same and its purposes, function and mode of operation, what we claim as new and useful and of our joint invention and desire to secure by Letters Patent is:—

1. In a coasting record apparatus for cars, trains or the like, the combination with a

motor controller, a brake controller, and recording mechanism of means controlled by the main motor controller and the brake controller for controlling said recording mechanism.

2. In a coasting record apparatus for cars, trains or the like, the combination with recording mechanism, a motor controller and a brake controller, of means controlled conjointly by said controllers for controlling the recording mechanism.

3. In a coasting record apparatus for cars, trains or the like, the combination with a brake controller and recording mechanism, of means for controlling the same, said controlling means rendered operative only when the motive power is shut off and the brakes released.

4. In a coasting record apparatus for cars, trains or the like, the combination with recording mechanism, electrical means for controlling the same and circuits therefor, of a car motor controller, and a brake controller, said motor and brake controllers arranged to control conjointly the circuits of said electrical means.

5. In a coasting record apparatus for cars, trains or the like, the combination with recording mechanism, a motor controller and a brake controller, of means for controlling said recording means including a magnet coil, the circuits of said coil being controlled by both said motor and brake controllers.

6. In a coasting record apparatus for cars, trains or the like, a motor controller, a brake controller, a recording mechanism and means for controlling the latter including a coil, means controlled by the car or train motor controller for closing a circuit through said coil, and means controlled by the car or train brake controller for closing another circuit through said coil.

7. In a coasting record apparatus for cars, trains or the like, a brake controller, a recording mechanism, and means for rendering said recording mechanism operative only when the car or train motive power is shut off and the brakes are released.

8. In a coasting record apparatus for cars, trains or the like, a recording mechanism, electric means for controlling said recording mechanism, a circuit breaker, a car motor controller and a brake controller, the circuits of said electric means and said circuit breaker being controlled by both the motor and brake controllers.

9. In a coasting record apparatus for cars, trains or the like, a recording mechanism, controlling devices therefor, a circuit for said controlling devices, a car motor controller and a brake controller both arranged, when in "off" position, to close said circuit, a contact device also arranged to open and close said circuit, and means for controlling said contact device.

10. In a coasting record apparatus for cars, trains or the like, a recording mechanism, controlling devices therefor, a circuit for said controlling devices, a car motor controller and a brake controller, both arranged, when in "off" position to close said circuit, a contact device also arranged to open and close said circuit, said motor and brake controllers also arranged to control said contact device.

11. In a coasting record apparatus for cars, trains or the like, a recording mechanism, controlling devices therefor, a circuit for said devices, a car motor controller and a brake controller, both arranged, when in "off" position to close said circuit, a contact device also arranged to open and close said circuit, a magnet coil for operating said contact device, and a circuit for said coil arranged to be closed by the car motor controller.

12. In a coasting record apparatus for cars, trains or the like, a recording mechanism and means for controlling the same including a magnet coil, a contact device operated thereby, a circuit for said coil, a car motor controller arranged to control said circuit, an auxiliary circuit for said coil, said contact device, when operated, serving to close said auxiliary circuit, and a brake

controller arranged when in "off" position, to close said auxiliary circuit.

13. In a coasting record apparatus for cars, trains or the like, a recording mechanism and means for controlling the same including a magnet coil, a preliminary and an auxiliary circuit for said coil, a motor controller arranged to control said preliminary circuit and a brake controller arranged to control said auxiliary circuit.

14. In a coasting record apparatus for cars, trains or the like, a record mechanism and means for controlling the same, including a magnet coil, a preliminary and an auxiliary circuit for said coil, a motor controller arranged to control said preliminary circuit, a brake controller arranged to control said auxiliary circuit, and a contact device operated by said coil for also controlling said auxiliary circuit.

In testimony whereof we have hereunto set our hands in the presence of the subscribing witnesses, on this 12th day of January A. D., 1909.

FRANK HEDLEY.
JAMES S. DOYLE.

Witnesses:

J. KLEIN,
S. E. DARBY.