C. C. DE MOCOMBLE.

SYSTEM FOR BRAKING MOVABLE PLATFORMS.

APPLICATION FILED DEC. 22, 1906.

934,085.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.

Fig. 2

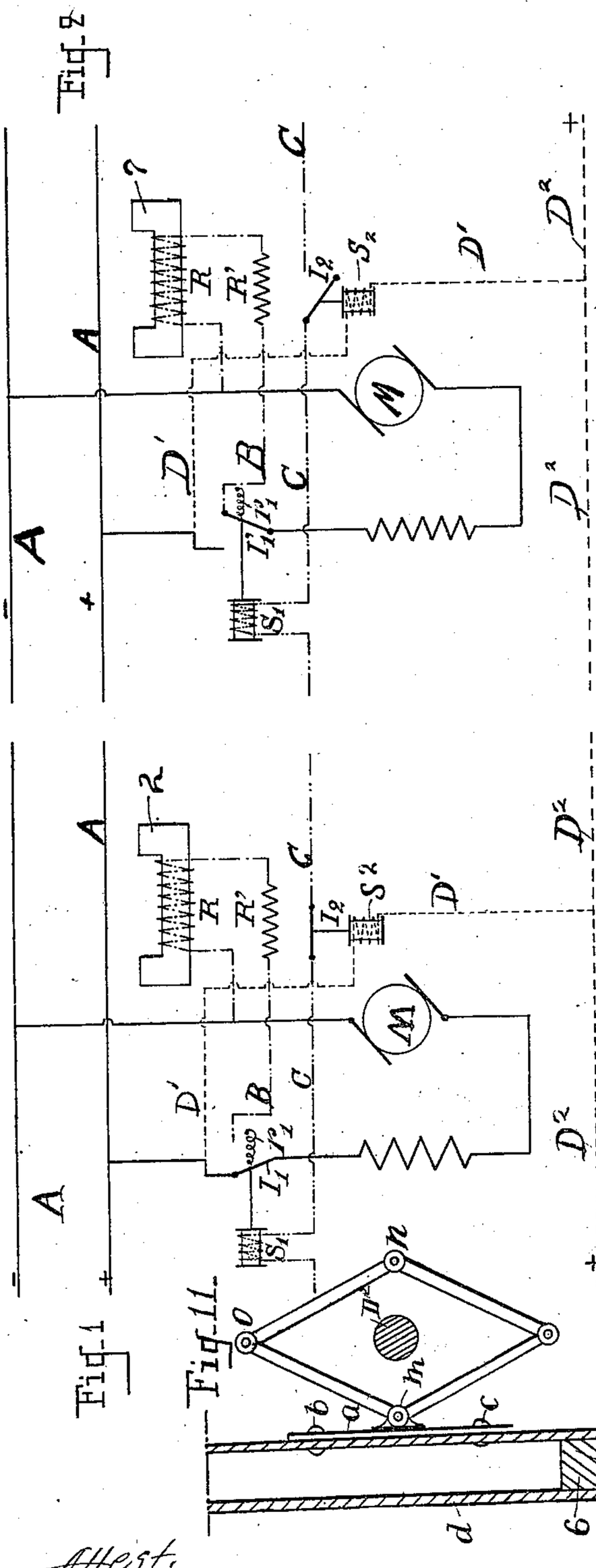


Fig. 1

Fig. 11

Fig. 9

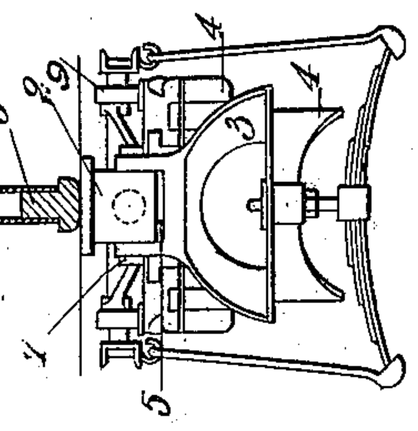


Fig. 8

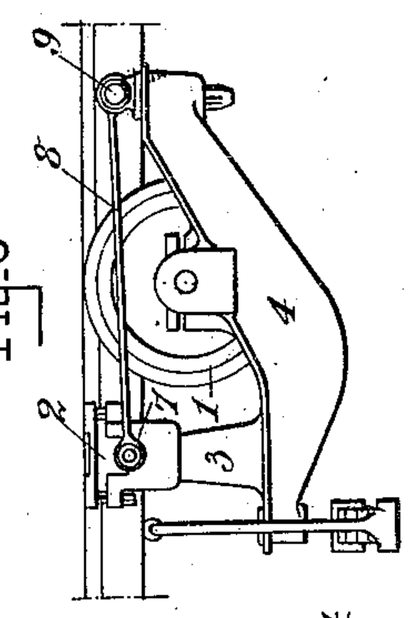


Fig. 7

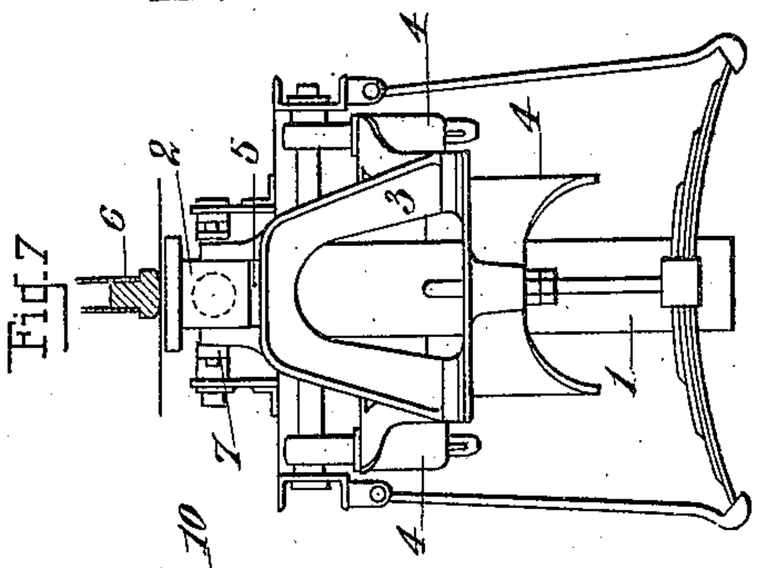


Fig. 6

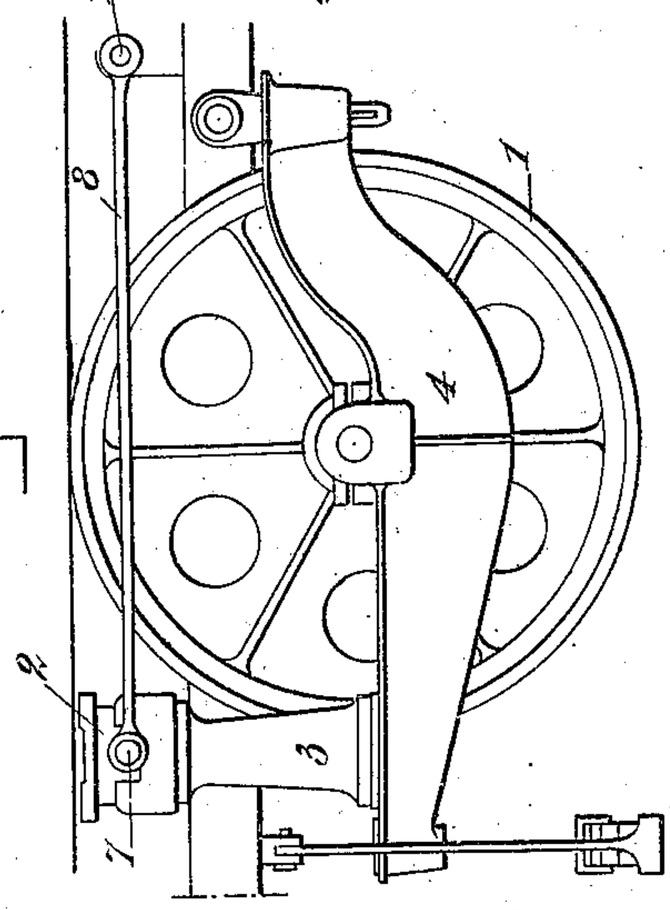
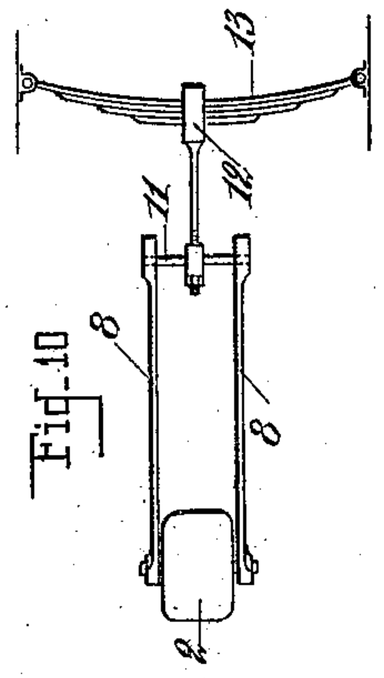


Fig. 10



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2 SHEETS—SHEET 2.

934,085.

Fig-12.

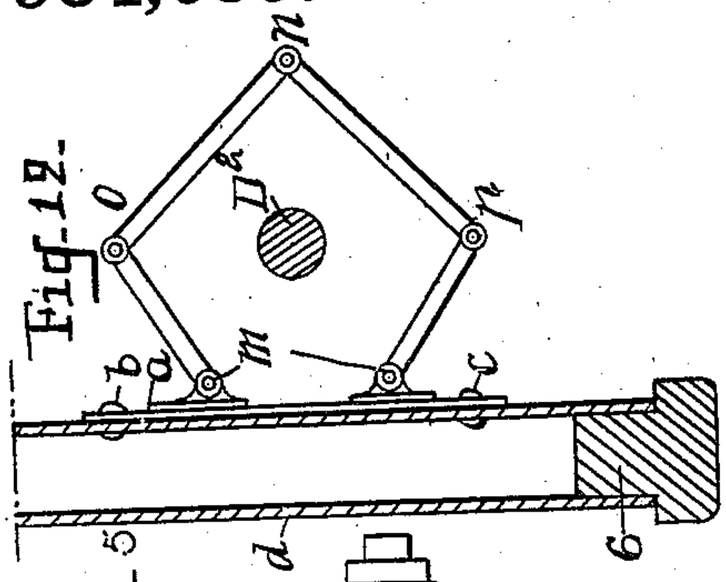
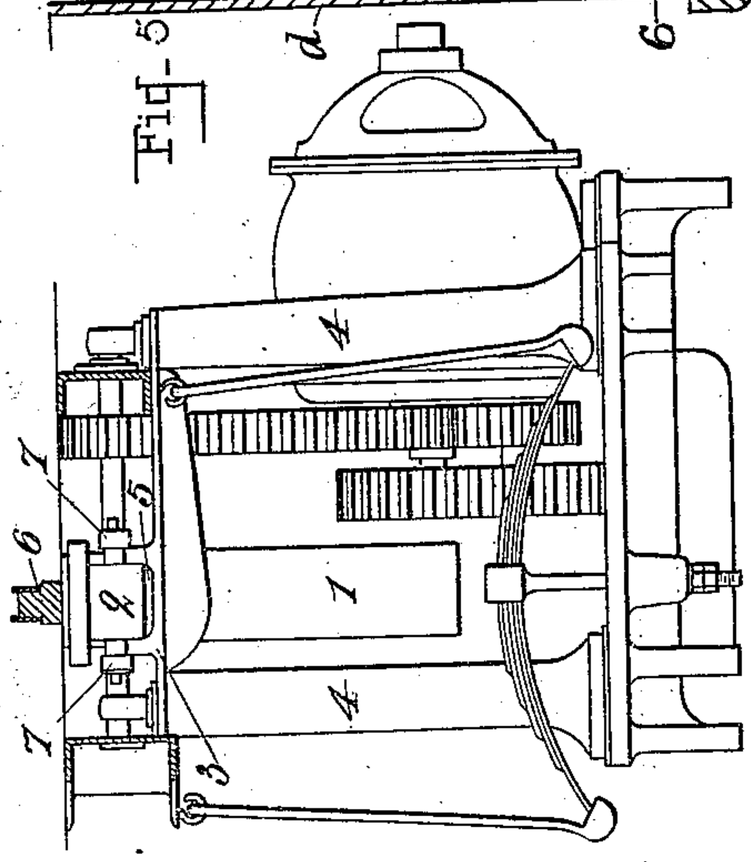


Fig-5



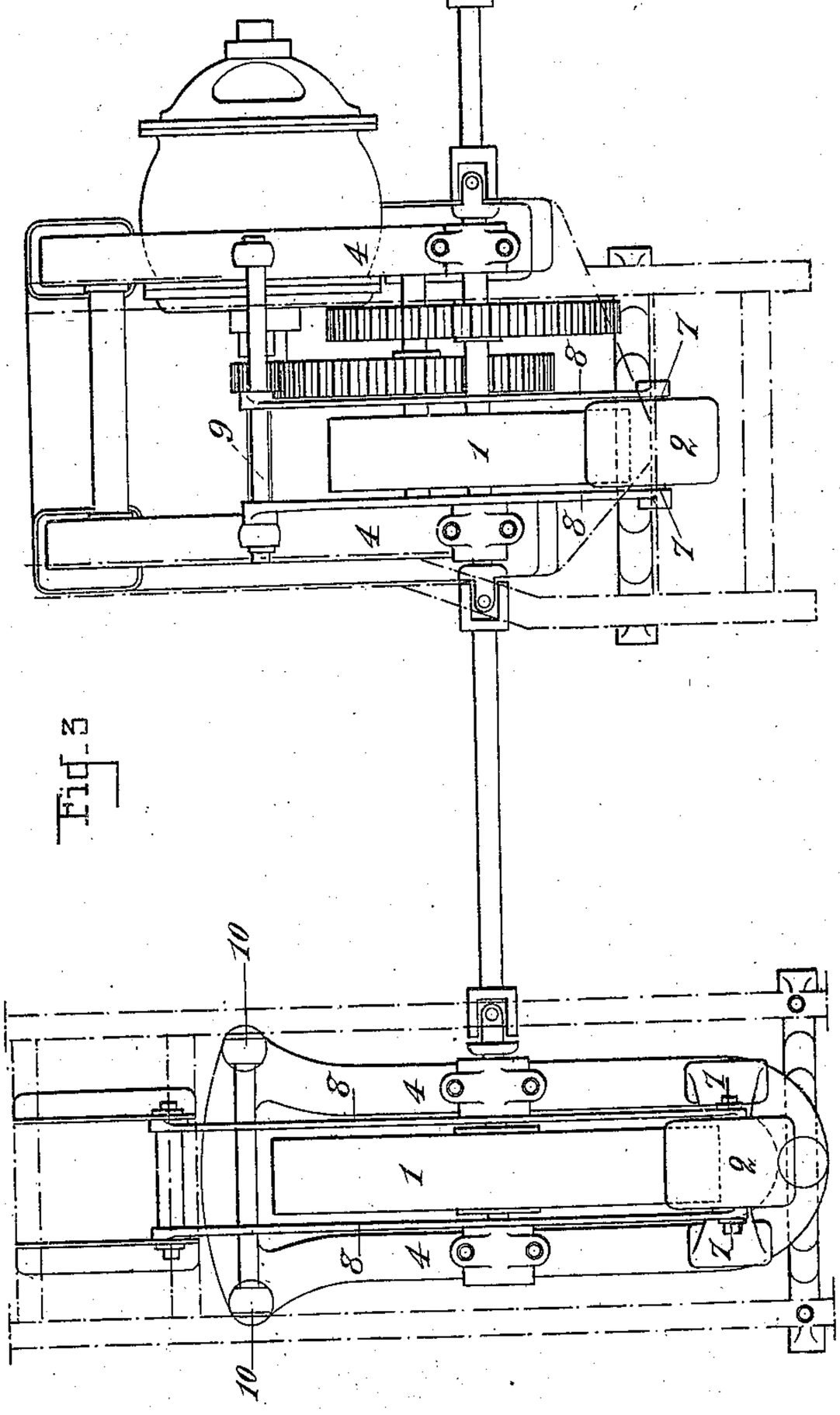


Fig-3

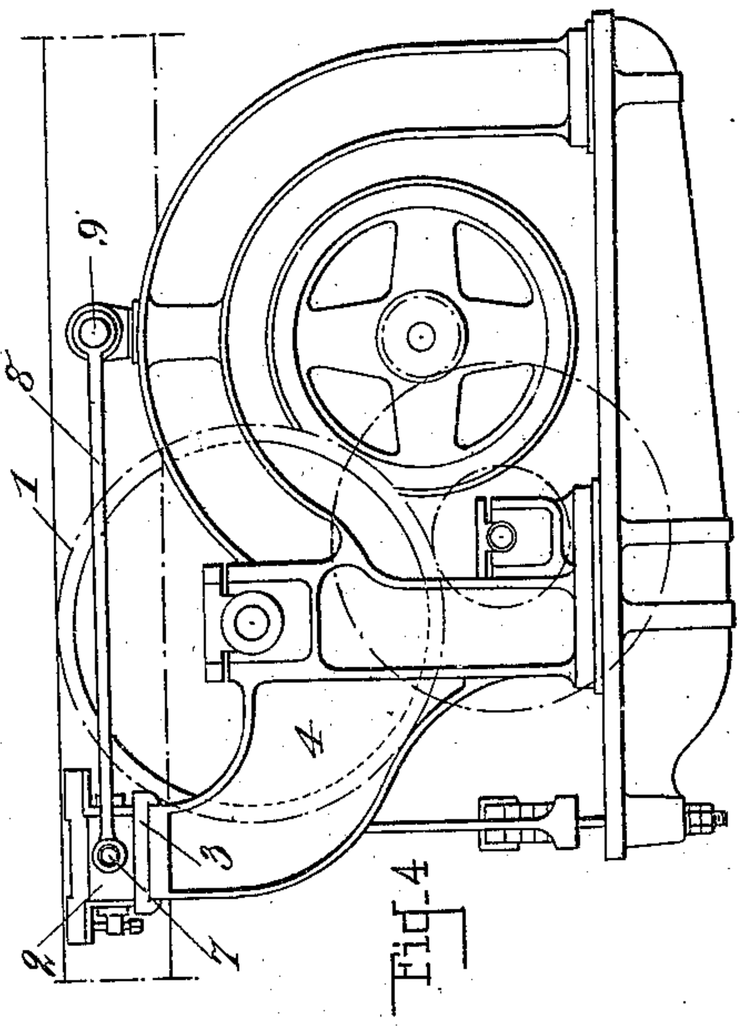


Fig-4

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UNITED STATES PATENT OFFICE.

CHARLES CAVELIER DE MOCOMBLE, OF PARIS, FRANCE.

SYSTEM FOR BRAKING MOVABLE PLATFORMS.

934,085. Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed December 22, 1906. Serial No. 349,158.

To all whom it may concern:

Be it known that I, CHARLES CAVELIER DE MOCOMBLE, citizen of France, residing at Paris, in the said Republic, have invented new and useful Improvements in Systems for Braking Movable Platforms, (for which I have obtained a patent in France No. 360,892, bearing date December 23, 1905,) of which the following is a specification.

The present invention has for its object a brake-contrivance for movable platforms moved by means of rollers or wheels acting on rails fixed beneath the truck-structures of the platform. The trucks are joined to each other and form a continuous platform. The wheels are established in a stationary way at a certain distance from each other and they are actuated by motors. The whole of the motor-system is erected in such a manner that it may oscillate around a horizontal axis in such a manner as to be able to press more or less upon the aforenamed rails.

The present invention has for its object to arrest the movement of the platform in case some obstacle stands in the way of its functions. For this purpose the corresponding preparatory means is arranged in such a way as to suppress, at first, the feeding of the current to the electric motors, then to set the brakes on the movable parts (rails) of the platform with the object of braking the motor-force and of slackening the live power of the parts in motion. To obtain this result, the invention is to establish, in each of the derivations of the principal circuit feeding each of the motors, an interrupter automatically actuated at the moment when the accident occurs and cutting off the feeding current of the motor, while the said dynamos then continue to run for a certain length of time under the action of the inertia of the platform which now carries them along instead of being carried along by them, and furnishing during this period of time the current which excites the elements of the brake-device.

The invention is illustrated in the accompanying drawings in which:

Figures 1 and 2 are diagrammatical views showing, respectively, the system during the normal working and during the braking. The Fig. 3 is a plan view of the main driver and of the wheels corresponding respectively to the high and to the low speed, the whole combined with electro-magnetic braking devices. The Figs. 4 and 5 are respectively, front and side elevations, showing said main driver combined with the bed of median speed. The Figs. 6–7 and 8–9 are views corresponding to Figs. 4 and 5 of the driving friction wheels, combined respectively with the beds of high and of low speeds. Fig. 10 is a detail view showing a device constituting an elasting coupling between the driving wheels and the frame work of the system. Figs. 11 and 12 are views showing the supports fixed on the frame work of the trucks of the system.

Similar references designate similar elements in the several figures of the drawings.

In order to actuate the rails carried by the truck-structures the rollers 1 are used which are operated by the motors M which are set up parallel, as indicated by Figs. 1 and 2 on the principal circuit A, and that by means of the interrupters I'_1.

If the movement of the whole sustains damage, then the interrupter I_1 takes up the position of I'_1, as will be explained hereinafter: in this position the feeding-current of the motor M is suppressed. But the motor carried along by the live impetus of the platform continues to run as a generator; the interrupter I'_1 then occupies such a position that the produced current passes through the circuit B. This circuit comes from the dynamo M and returns to it by the interrupter I'_1 by the resistance R′ (which may be regulated) and by the spool R of the electro-magnet 2. The latter is placed exactly beneath the rail 6 fastened to the platform and thus exerts an attractive influence upon the latter, an influence the value of which may be varied at will by the regulation of the resistance R′.

For the automatic management of the interrupter I_1 the following device is used: The interrupter I_1 is subjected to the action of a spring r_1 which pulls this interrupter to the position convenient (Fig. 2) for closing the circuit B when the solenoid S_1 is no longer energized. In order to cause the energization of this solenoid to stop at the desired moment, there is placed in the circuit C an interrupter I_2 which is normally closed, but which opens when a solenoid S_2 is energized. The solenoid is placed in a circuit D^1 set up parallel with the conductor A. On the other side the said circuit is connected with the insulated conductor D^2, which ex-

tends throughout the entire length of the platform. Normally the two extremities of the circuit D^1 terminate at the positive conductor and are consequently at the same potential, no current therefore passes in this circuit, the electro-magnet S^2 is not energized and the interrupter I_2 remains closed. When however, owing to an abnormal displacement of one of the trucks, the conductor D^2 comes into contact with some one of the parts of the parallelograms *m*, *n*, *o*, *p*, the conductor is earthed and consequently the same is the case with circuit D^1. The current then passes through this latter owing to the difference of potential existing between the conductor 1 and the earth, the electro-magnet is energized, and the interrupter I_2 opened.

The devices mentioned above may be established by means of an articulated polygon, in the form of a parallelogram or pentagon (Figs. 11 and 12) in such a manner that, in the planes *m*—*n* and *o*—*p*, the liberty necessary for the play of the springs and the flexibility of the hanging devices of the trucks may be obtained. This arrangement presents the advantage of enabling a practical adjustment on the spot, the adjustment obtained, the articulations are fixed in position by means of suitable fastening devices. These polygons are fastened by one or two of their vertices upon a plate *a* which is itself secured by pins *b* and *c* upon the member *b* secured to the movable rail 6. Each of the vertices of these polygons bears a nut of a screw *m*, *n*, *o*, *p* which makes it possible to regulate the distance separating its sides from the conductor D^2, at the moment when the device is being installed. After this regulation has once been made, the polygons in question remain unchangeable as to form. It is easy to understand, then, that if, under such conditions of arrangement, one of the trucks of the platform happens to become subject to an abnormal displacement, the result will be that the three polygons borne by this truck and by the two neighboring trucks are no longer arranged in a line parallel to the axis of the track, and that one of the sides of these polygons will meet with the conductor D^2, thereby causing the latter to be grounded, and, in this manner, perform the brake-action, as above described. The previous regulation of the sides of the polygons by means of the screw-nuts *m*, *n*, *o*, *p* has the aim to determine the amplitude of the aforesaid displacement, necessary to ground the conductor D^2.

In Figs. 3–9 is indicated by way of example the application of the improved system in question to the friction mechanism described in my Letters Patent #633,881.

In order to apply the braking device specified above each of the driving rollers 1 is provided with an electro-magnet 2, serving as a brake shoe by acting respectively upon each of the movable rails 6. The said shoe 2 is established on a special support 3, arranged in the front of the cast frame 4, which supports the driving roller. The support 3 presents at its upper part a slide 5, in which the brake shoe rests freely. The said shoe is provided, in each of its ends, with a stud 7, acting by traction upon a connecting rod 8 which bears against either the hanging axle 9 (Figs. 4, 5, 8, 9) or an independent axle 10 (Figs. 3, 6, 7).

The braking device being thus constituted, it is obvious that upon the electro-magnet being excited, the shoes adhere to the movable rails, with an intensity which may be always regulated as desired, by means which consists in placing in the circuit B, indicated by the lines —. —. —. —. —, a suitable resistance R′, which may be graduated by means of suitable plates. The braking effort, is therefore immediately transmitted to the connecting rods and the frame-work, without shocks, and without affecting the casting frame of the mechanisms. On the other hand, the system above specified insures an instantaneous working of the brake, as such is the object of any braking device which must act in the case of danger or accident. If, however, it is desirable to obtain a progressive braking, in state of transmitting the effort either to the fixed point or to the frame-work through rigid connecting pieces, it is sufficient to intercalate between the connecting rods and the frame-work, an elastic coupling device. For this purpose, it is sufficient (Fig. 10), to join together the two connecting rods 8 by means of a cross-bar 11 having an eye and receiving a bolt 12 provided with a strap, said strap being fixed on a flat spring 13 which is fixed at its extremities on the frame work of the system. Under these conditions, the shoe 2 which sets itself at first upon the rail 6 will not directly, with all its force of adherence, rub upon the latter, but it will, on the contrary, be dragged on by it to a small extent, this being due to the elasticity of the spring 13 which permits of this very slight dragging on of the shoe 2. As soon as the tension of the said spring (which is caused thereby) has become superior to the adherence of the shoe, the latter will act upon the rail as if the spring 13 were a fixed point, since it does not permit the said shoe to be dragged on by the rail, and then the braking by friction takes place just as before. It is obvious that in this latter case, it is necessary to provide on the support a free space necessary for the course of the shoe, and that the studs of the connecting rods would be disposed at the upper part of the shoe, above the slide.

The two modifications above specified may be indifferently applied to friction driving

mechanism for movable platforms indicated in the drawings; they are equally efficient, the first being only more rapid.

From the above specification, it results that, in normal working, the friction driving wheels serve also to produce the stop by borrowing from the platform, during its motion, the energy necessary for the dynamo exciting the electro-magnets.

What I do claim as my invention and desire to secure by Letters Patent, is:

A device for the purpose of arresting the movement of movable platforms when some obstacle stands in the way of their functions, comprising a motor, interrupters I_1 I_2, a solenoid S′ normally actuating said interrupter I_1 to close the motor circuit, a solenoid S_2 which becomes energized in case of accident, and then actuates the interrupter I_2 which cuts off the circuit of the solenoid S_1, thus freeing the interrupter I_1 and breaking the motor circuit, the impetus of the platform then causing said motor to run as a generator sending a current into the circuit of solenoid, already closed by the interrupter I_1, of an electromagnet whose vertebrated core presses against the rail of the platform and there causes a braking-friction.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES CAVELIER DE MOCOMBLE.

Witnesses:
JULES FAYOLLET,
EUGÈNE PICHON.