Oct. 6, 1931. F. DELOISON 1,825,899

RAILWAY CAR RETARDER

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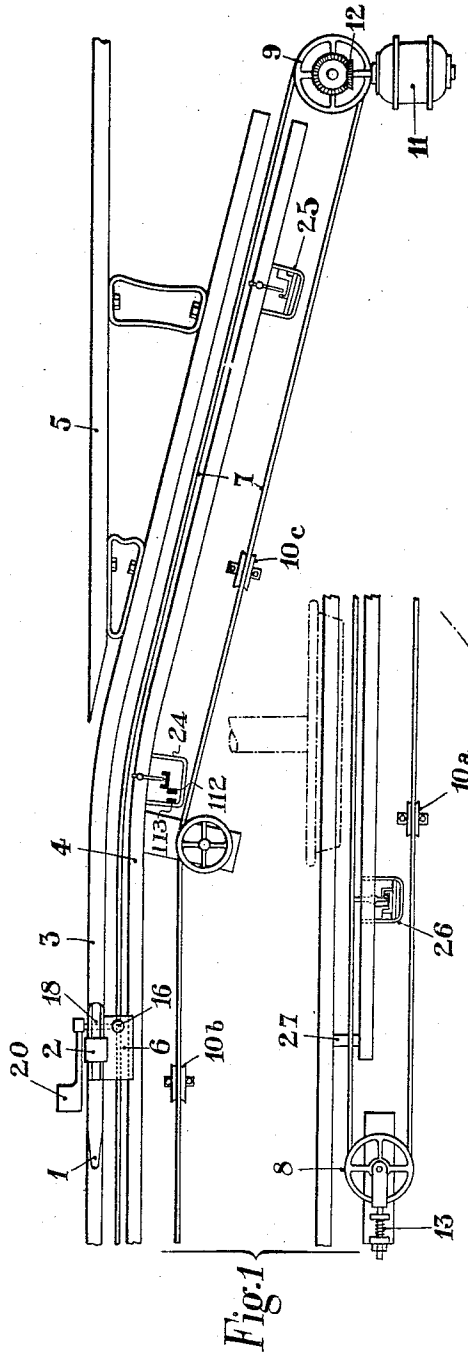


Fig:1

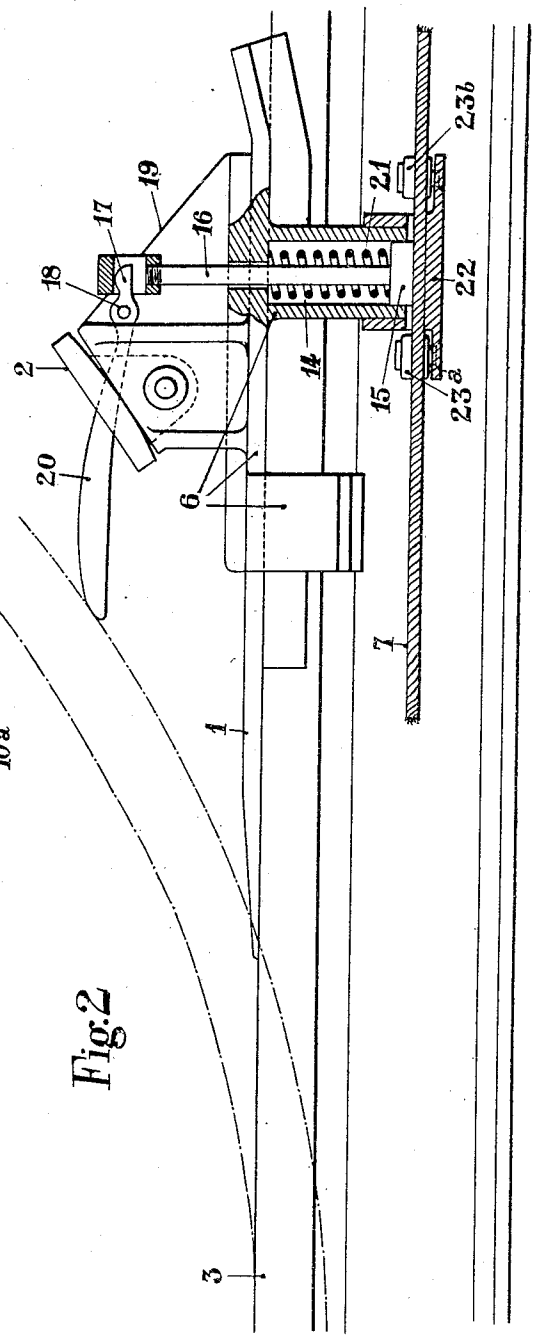


Fig:2

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Fig. 3

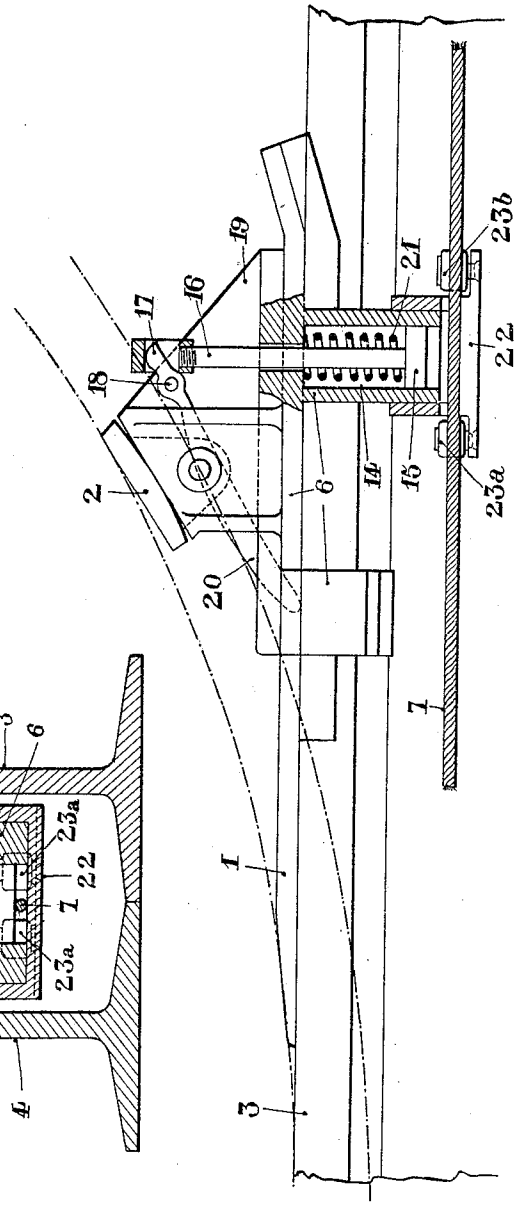
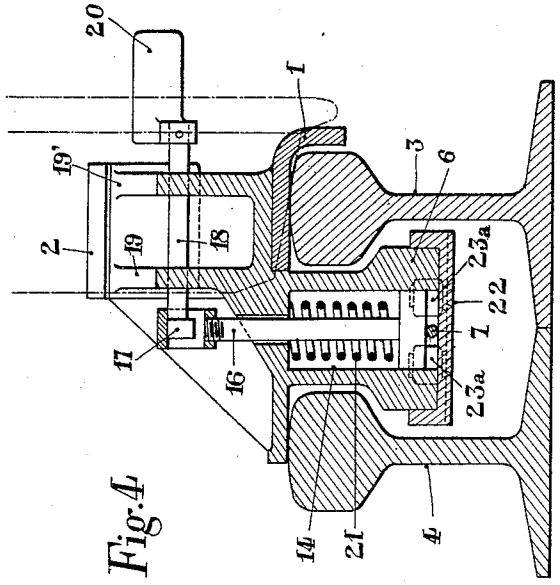


Fig. 4



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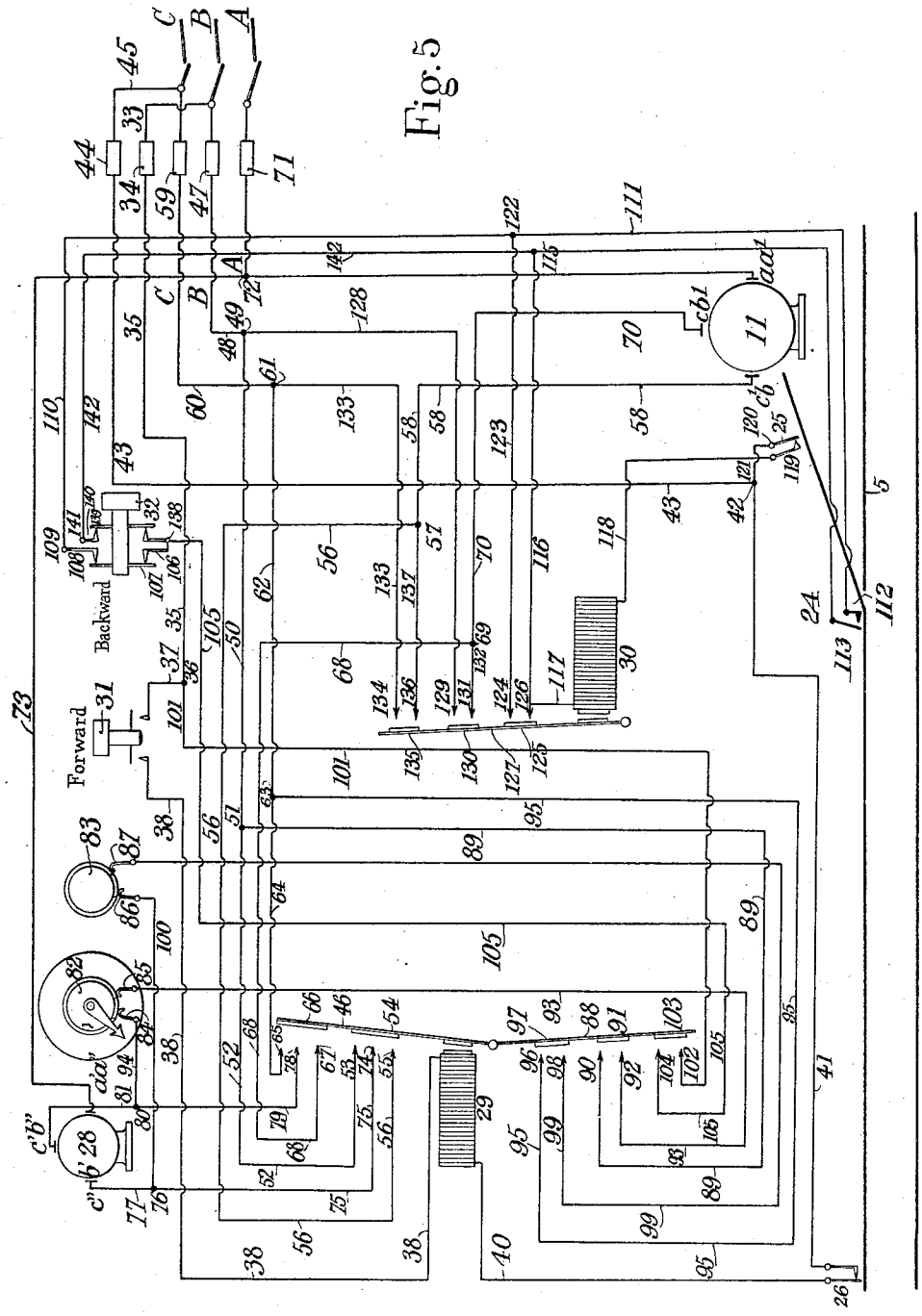
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Fig. 5



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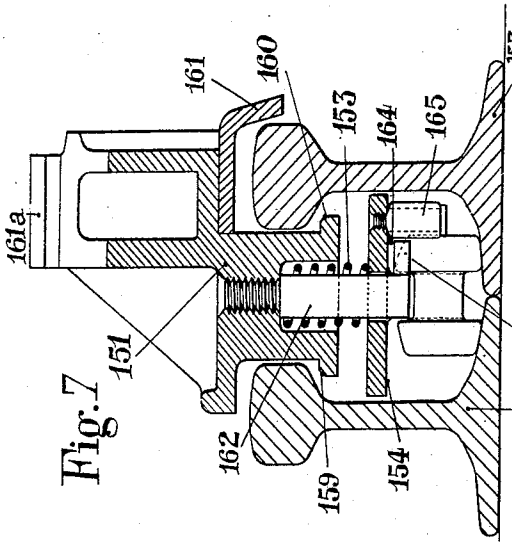


Fig. 7

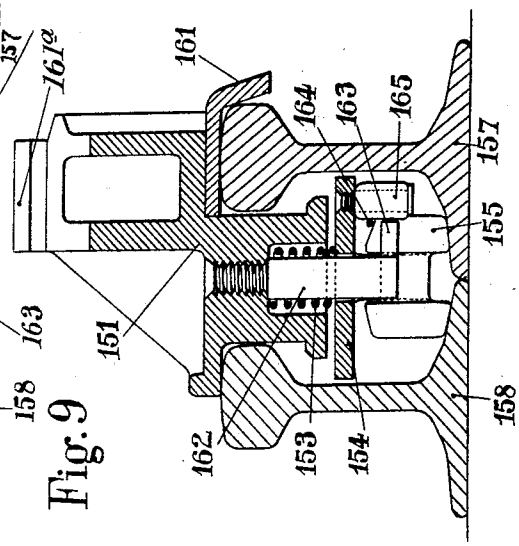


Fig. 9

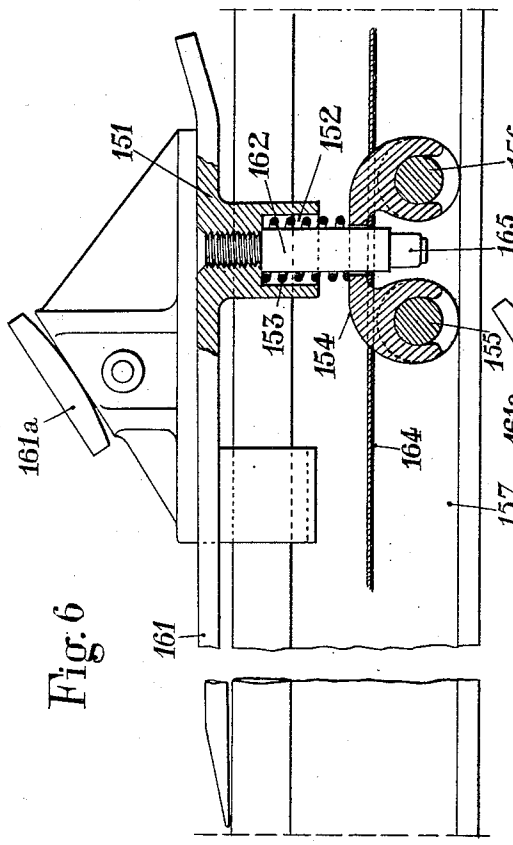


Fig. 6

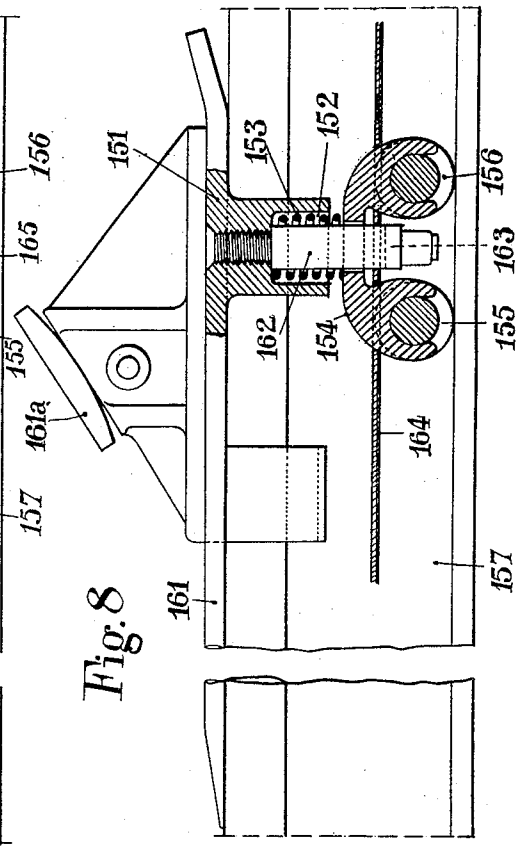


Fig. 8

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Fig. 12.

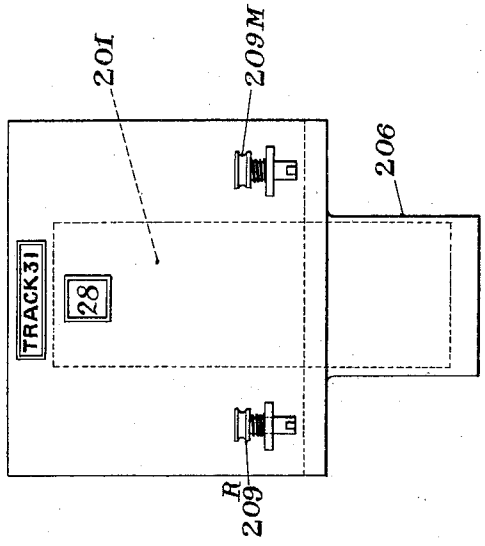


Fig. 10

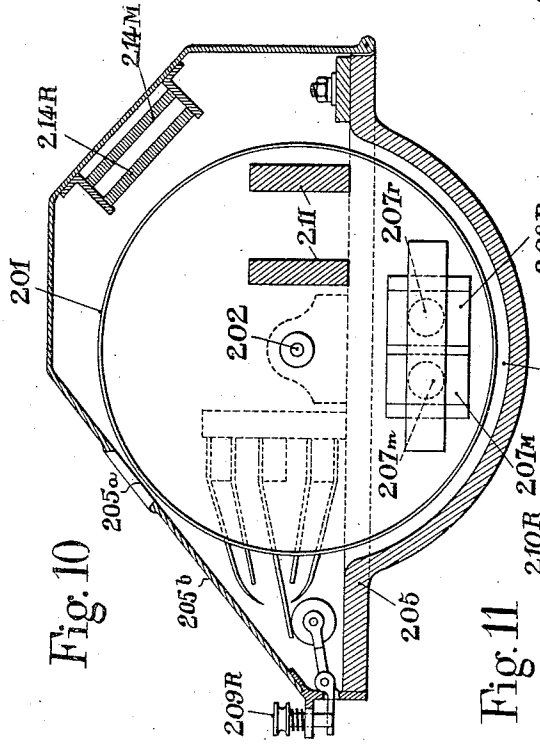
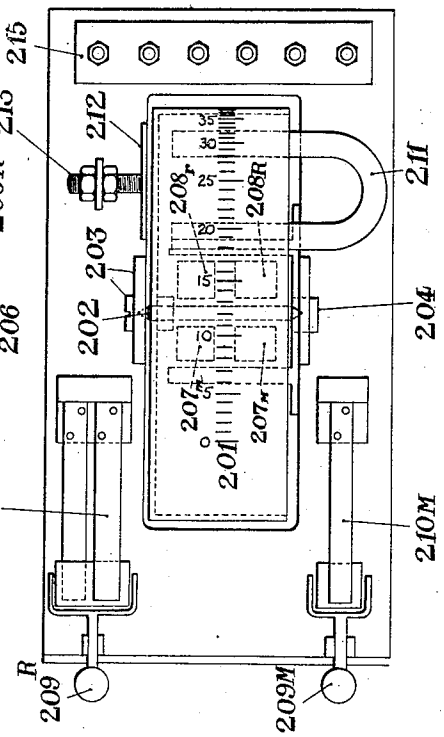


Fig. 11



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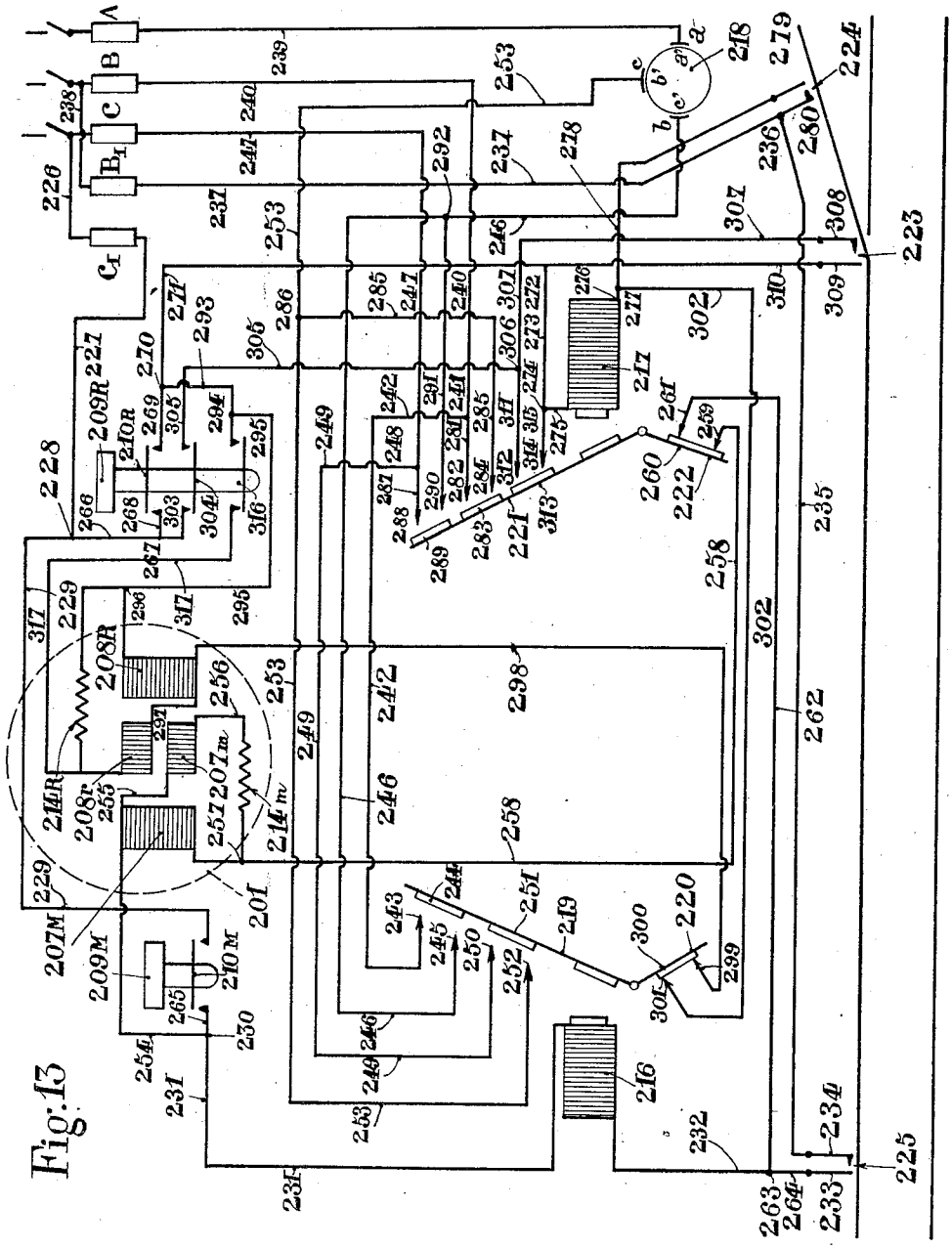


Fig. 13

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Patented Oct. 6, 1931 1,825,899

UNITED STATES PATENT OFFICE

FERNAND DELOISON, OF LA DELIVRANCE PAR LOMME, FRANCE

RAILWAY CAR RETARDER

Application filed January 3, 1930, Serial No. 418,273, and in France January 7, 1929.

The present invention relates to apparatus for retarding railway cars in shifting yards wherein a skidder is mechanically shifted onto one of the track rails, and onto which the first wheel of the car will climb before causing said skidder to slide until the same is shifted aside by a deviated portion of the rail, thus allowing the car to go on running at reduced speed as it engages an additional rail located at the beginning of the deviated portion of the first mentioned rail in alignment with the rectilinear portion of the said rail.

In accordance with the present invention, the shoe which is normally placed on the siding formed by the deviated portion of the rail, is drawn on to the track by an endless cable which winds on a pulley actuated by an electric motor.

The connection of the cable and of the shoe is mechanically effected for the placing in position of the brake-shoe on the track, but the shoe is rendered independent from the driving members at the time the waggon approaches the same before drawing it along in its sliding movement on the said track.

The accompanying drawings illustrate, by way of example two forms of construction of the subject-matter of the invention.

Fig. 1 is a plan view of the entire apparatus placed on the track.

Fig. 2 is an elevation showing in elevation, partly in section, the connecting device of the cable and of the shoe when the wheel has not climbed on the shoe, that is to say during the periods of rest or of placing in position of the shoe.

Fig. 3 is an elevation showing in section the same mechanism during the braking period, that is to say during the sliding movement of the shoe, on the sole of which the wheel of the waggon has mounted.

Fig. 4 is a sectional side view of this mechanism during the periods in which the shoe is released from the wheel of the waggon, as in the case of Fig. 2.

Fig. 5 is a diagram of the electric connections allowing the electro-mechanical control, from a distance, of this apparatus.

Fig. 6 shows in elevation, partly in section, another form of construction of the mechanism for connecting the cable and the shoe, when the wheel has not mounted on the shoe, that is to say during the periods of rest or of placing in position of the shoe.

Fig. 7 is a sectional side view of the same mechanism when the shoe is released from the wheel of the waggon, that is to say during the same periods as in the case of Fig. 6.

Fig. 8 is an elevation, showing in elevation, partly in section, the same connecting mechanism during the braking period, that is to say during the sliding movement of the shoe, on the sole of which the wheel of the waggon has mounted.

Fig. 9 is a sectional side view of the same mechanism during the braking period as in the case of Fig. 8.

Fig. 10 is an elevation showing in elevation and in section the mechanism of a control handle for the electric apparatus.

Fig. 11 is a plan view thereof.

Fig. 12 is a side view of the same apparatus.

Fig. 13 is a diagram showing the whole of the electric fittings for a brake-shoe combined with this control mechanism.

According to Figs. 1 to 4, the shoe has a steel sole member, one end of which is thinned and the other end of which carries a stop piece 2 against which abuts the front wheel of the waggon.

The guiding of the shoe is ensured by the rail 3 of the track, to which is assembled a parallel outer counter-rail 4 of variable length. Both these rails are slightly deflected at one of their ends, so as to form a siding on which the shoe is shunted.

At the beginning of the deflected portion of the rail 3; and in alignment with the rectilinear portion of the latter, is assembled another rail 5, one end of which is bevelled, providing between the two rail heads a depression for the passage of the side cheek of the shoe.

The sole member 1 of the shoe is secured by means of bolts or rivets on a slide-block 6, the side faces of which exactly fit the profile of the heads of both rails and which slides in the slide formed by the latter.

The shoe and its slide-block are moved in both directions on the track by means of a driving endless cable 7 which passes round the apparatus for guiding the shoe and winds on two pulleys 8 and 9 placed at each end of this apparatus.

One of the runs of the cable passes within the slide constituted by both rails, the other run is situated outside the counter-rail 4. This latter run is supported by small intermediate pulleys 10*a*, 10*b*, 10*c*, etc., which are arranged at intervals on the sleepers of the track so as to ensure the guiding of the cable.

The pulley 9 is driven in both directions of rotation by a motor 11 connected to this pulley through the medium of a speed reducing gear 12.

The connection between this motor 11 and the pulley 9 can be effected by any other suitable device.

The pulley 8 is secured on a stretcher 13 allowing to maintain the tension of the cable 7.

The cable and the shoe are connected by causing the run of the cable 7 laying between both rails to pass in the slide-block 6 of the shoe, devised for receiving the connecting device hereinafter described:

In a bore 14 vertically formed in the slide-block 6, is arranged a piston 15, the upper part of the rod 16 of which is connected to the lever 17 mounted on an axis 18 carried by two ribs 18 and 19', this lever being rigid with a pedal 20 placed on the side of the shoe.

A spring 21 is arranged between the bottom of the bore 14 of the slide-block 6 and the upper-face of the piston 15.

A plate 22 secured to the slide-block 6, obdurates the lower part of the bore 14. It clamps the cable 7 between its upper face and the lower face of the piston 15. A pair of rollers 23*a* are mounted on one end of the plate 22 while a further pair of rollers 23*b* are mounted on the opposed end, and the cable passes between both rows of two rollers.

The operation of the apparatus is as follows:

The shoe being shunted on the siding constituted by the deflected portion of the rails 3 and 4, is connected to the cable 7 which is clamped between the piston 15 and the plate 22 owing to the pressure of the spring 21.

By means of a remote control, the construction of which will be described later on, it is possible to close the circuit of the motor 11 which causes the pulley 9 to rotate, through the medium of the speed reducing gear 12, in the suitable direction for moving the cable 7 so as to draw the shoe on the track 3.

The adjustment of the position of the shoe is obtained by means of a driving controller which allows to obtain an infinite number of positions of the shoe by actuating the driving apparatus during the time equal to a definite period of running of the motor 11.

When the motor 11 ceases to rotate, the shoe stops on the track and remains secured to the cable 7, until the first wheel of the waggon to be braked comes in contact with the pedal 20, by coming in engagement with the sole member 1.

The pivot of the pedal 20 which inclines downwardly has for effect to rock the lever 17 which raises the rod 16 of the piston 15.

In this displacement, the piston 15 releases the cable 7 and compresses the spring 21.

The waggon then draws the shoe with a sliding movement on the rail 3 and separates therefrom at the time the shoe deviates on the deflected portion of the slide constituted by the rails 3 and 4, and continues to run on the track by coming in engagement with the rail 5.

The tyre of the wheel by abandoning the pedal 20 allows the spring 21 to expand and push back the piston 15 towards the plate 22, clamping against the cable 7, which again becomes connected with the shoe.

For preventing the wheels of the axles of the waggon to come in engagement with the shoe in an oblique position at the entrance of the siding, a contact device 24 is arranged at this place on the counter rail 4. When the finger of the contactor is struck by the passing slide block of the shoe, it momentarily closes the circuit of an electric relay which causes the motor to start in the suitable direction for drawing the shoe towards the rear portion of the siding, until the shoe strikes the branch of a contactor 25, placed on the counter-rail 4, which cuts off the current for the motor 11.

The equipment of the apparatus is completed by the adjunction of a contactor 26 which is arranged at the opposite end of the counter-rail 4, and the branch of which is struck by the shoe when it comes to its longest length of braking in order to avoid the breaking of the cable which might occur if the shoe should strike the stop abutment 27 which prevents the shoe from leaving its guide-way.

Fig. 5 illustrates the electric apparatus operating with three-phase current of this device, which comprises a driving controller constituted by a small motor driving a shaft on which are rigidly secured two drums 82 and 83, made of insulating material. These drums are each incompletely surrounded by a conducting ring on which wipe two contacts, one of which rests on the conducting ring, and the other on the insulating sector during the period of rest of the small motor, two phases of which are cut by the said contacts.

An index rigidly secured at the end of the shaft, moves over a graduated sector during the operation of the motor, and the amplitude of its rotation indicates the extent of the displacement of the shoe.

A relay provided with two coils 29 and 30

controls both movements of rotation of the motor.

The relay of the coil 29 has two sets of vanes 46 and 88; that of the coil 30 has a single set of vanes 127. In the position of rest, the vanes 46 are spaced from their contacts, and their vanes 88 rest on their contacts. The vanes 127 are also spaced from their contacts.

A button 31 placed in the operating box controls the climbing of the shoe on the track.

A button 32 also placed in the operating box controls the return of the shoe towards the end of the siding track.

The electric operation of the apparatus is as follows:

By pressing on the button 31, the circuit I of the coil 29 is closed:

Phase B—conductor 33—fuse 34—conductor 35—terminal 36—conductor 37—button 31—conductor 38—coil 29—conductor 40—contactor 26 for the end of the stroke—conductor 41—terminal 42—conductor 43—fuse 44—conductor 45—phase C.

The attraction of the coil 29 draws the vane 46 against the contacts closing the circuit II of the motor 11 and the circuit III of the small motor 28 of the controller.

Circuit II of the motor 11 actuating the cable:

Phase *a*, directly fed by the source A;

Phase *b*, fed by: source B—fuse 47—conductor 48—terminal 49—conductor 50—terminal 51—conductor 52—contact 53—contact-piece 54—contact 55—conductor 56—terminal 57—conductor 58;

Phase *c*, fed by: source C—fuse 59—conductor 60—terminal 61—conductor 62—terminal 63—conductor 64—contact 65—contact-piece 66—contact 67—conductor 68—terminal 69—conductor 70.

Circuit III of the motor 28: phase *a'* fed by: source A—fuse 71—terminal 72—conductor 73;

Phase *b'* fed by: source B—fuse 47—conductor 48—terminal 49—conductor 50—terminal 51—conductor 52—contact 53—contact-piece 54—contact 74—conductor 75—terminal 76—conductor 77;

Phase *c'*, fed by: source C—fuse 59—conductor 60—terminal 61—conductor 62—terminal 63—conductor 64—contact 65—contact-piece 66—contact 78—conductor 79—terminal 80—conductor 81.

The motors 11 and 28 rotate in the same direction during the time of the pressure exerted on the operating button 31.

During the rotation of motor 28, the contacts 84 and 85 rest on the contacting ring of the drum 82 and the contacts 86 and 87 on that of the drum 83.

When the pressure on the button 31 is released, or when the shoe passes the contactor 26, the circuit I of the coil 29 is opened by breaking the connection between the conductors 37 and 38.

The attraction of the vanes 46 ceases: the contact-piece 54 moves away from the contacts 53—55—74, and the contact-piece 66 moves away from the contacts 65—67 and 78, opening the circuits II and III of the motors 11 and 28.

But the fall of the vane 46 causes the vane 88 to fall upon its contacts and thus determines the closing of the circuit IV of the small motor 28 which immediately rotates in reverse direction owing to the reversal of the phases *b'* and *c'*:

Circuit IV for reversing the motor 28: phase *a''*, fed by: source A—fuse 71—terminal 72—conductor 73;

Phase *b''*, fed by: source B—fuse 47—conductor 48—terminal 49—conductor 50—terminal 51—conductor 89—contact 90—contact-piece 91—contact 92—conductor 93—contact 85—conducting ring 82—contact 84—conductor 94—terminal 80—conductor 81;

Phase *c''*, fed by: source C—fuse 59—conductor 60—terminal 61—conductor 62—terminal 63—conductor 95—contact 96—contact-piece 97—contact 98—conductor 99—contact 87—conducting ring 83—contact 86—conductor 100—terminal 76—conductor 77.

The rotation of the small motor 28 and consequently that of the drums 82 and 83 takes place until the contacts 84 and 86 come in engagement with the insulating sectors of the drums 82 and 83, thus cutting two feeding phases of the motor 28, which stops.

The return backward of the shoe from its position on the track and its re-entrance on the siding track can be obtained by causing the motor 11 to rotate in a reverse direction to that serving for the climbing of the shoe by the putting in action of its induction coil 30, the circuit of which can be closed either by the action of the pedal 24 on a contact, or by the pressure exerted on the operating button 32. The closing of the circuit V of the coil 30, under the action of the pedal 24, is effected as follows:

Phase B—conductor 33—fuse 34—conductor 35—terminal 36—conductor 101—contact 102—contact-piece 103—contact 104—conductor 105—contact 106—vane 107—contact 108—terminal 109—conductor 110—terminal 122—conductor 111—contact 112 and flexible vane 113 of the pedal 24—conductor 114—terminal 115—conductors 116 and 117—coil 30—conductor 118—contact 119 and flexible vane 120 of the contactor 25—conductor 121—terminal 42—conductor 43—fuse 44—conductor 45—phase C.

The attraction of the coil 20 draws the vane 127 against its contacts and the circuit remains closed, although the movable vane 113 moves away from the contact 112 after passage of the wheel of the waggon on the

pedal 24, because the current then follows the following circuit VI:

Phase B—conductor 33—fuse 34—conductor 35—terminal 36—conductor 101—contact 102—contact-piece 103—contact 104—conductor 105—contact 106—vane 107—contact 108—terminal 109—conductor 110—terminal 122—conductor 123—contact 124—contact-piece 125—contact 126—conductor 117—coil 30—conductor 118—contact 119 and flexible vane 120 of the contactor 25—conductor 121—terminal 42—conductor 43—fuse 44—conductor 45—phase C.

The closing of the circuit VII of the coil 30 takes place as follows, under the pressure of the operating button 32:

Phase B—conductor 33—fuse 34—conductor 35—terminal 36—conductor 101—contact 102—contact-piece 103—contact 104—conductor 105—contact 138—movable vane 139—contact 140—terminal 141—conductor 142—terminal 115—conductors 116 and 117—coil 30—conductor 118—contact 119 and flexible vane 120 of the contactor 25—conductor 121—terminal 42—conductor 43—fuse 44—conductor 45—phase C.

The closing of the circuits V or VII of the coil 30 determines the attraction of the vane 127 against its contacts and closes the circuit VIII of the motor 11 which rotates in reverse direction to the direction of rotation it takes when it is fed by the circuit II, owing to the reversal of the phases *b* and *c*.

Circuit VIII for reversing the motor 11; phase a^1 directly fed by the source A:

Phase b': source B—fuse 47—conductor 48—terminal 49—conductor 128—contact 129—contact-piece 130—contact 131—conductor 132—terminal 69—conductor 70.

Phase c^1: source C—fuse 59—conductor 60—terminal 61—conductor 133—contact 134—contact-piece 135—contact 136—conductor 137—terminal 57—conductor 58.

The motor 11 rotating in reverse direction, draws the shoe on to the siding track until the shoe meets the branch of the contactor 26 which moves the flexible blade 120 away from the contact 119, thus opening the circuits VI or VII of the coil 30.

The induction of the coil 30 being broken, the attraction of the vane 127 against its contacts ceases and the circuit VIII of the motor 11 is broken; the contact-piece 130 moves away from the contacts 129 and 131 by cutting the phase b', and the contact-piece 135 moves away from the contacts 134 and 136 by cutting the phase c'.

The above-description refers to the cases in which the apparatus are fed with alternating current. It is to be understood that direct current could be used for the same purpose, without departing from the scope of the invention.

Likewise, the use of a pedal with retarded contact could be substituted for that of the pedal 24.

The cable 7 could be wound on the pulleys 8 and 9, with the two runs passing outside the counter-rail 4, and an attaching device with an extensible arm for instance, could be used for rendering the cable integral with the shoe and serving to draw the latter on the track, whilst remaining within the scope of the present invention.

As shown in Figs. 6 to 9, the connection of the shoe with the cable is obtained by means of a device slightly different from that illustrated in Figs. 1 to 4.

In the slide 151 of the shoe, is formed a bore 152 adapted to receive a spring 153, which is placed between the bottom of the bore 152 and the top of the cable of a carriage 154, the rollers 155 and 156 of which roll on the inner feet of the rails 157 and 158 for guiding the shoe. The relaxation of the spring 153 raises the rear part of the shoe, owing to a sufficient play provided between the side guides 159 and 160 of the slide 151 and the heads of the rails 157 and 158.

In this way, the sole 161 of the shoe takes an inclined position relatively to the cable of the head of the rail 157.

In the axis of the bored portion of the slide 151, and concentrically with the spring 153, is secured a rod 162 which passes through the table of the carriage 154, thus rendering the shoe rigid with this carriage in its displacements.

The rod 162 terminates at its lower part by a claw 163.

The cable 164 for driving the carriage, is placed between this claw 163 and the table of the carriage 154, and it is laterally maintained by a roller 165 vertically secured on this carriage, opposite the claw 163.

When the spring 153 has relaxed, the claw 163 of the rod 162 presses the cable 164 against the lower face of the table of the carriage 154.

The cable is thus connected with the carriage and, consequently, with the shoe which accompanies this carriage in all its displacements in the guideway.

If the cable is actuated, the carriage and the shoe are driven in the same direction.

But, when the wheel of the waggon rides up on the sole 161 of the shoe, the slide 151 lowers under the weight of the wheel and compresses the spring 153.

The rod 162 also lowers and the claw 163 moves away from the lower face of the table of the carriage 154.

The cable 164 is thus released, and the carriage 154, as well as the shoe 151, become independent from the cable for the entire duration of the sliding movement of the shoe under the push or thrust of the waggon.

When the wheel moves away from the sole 161, at the time the shoe moves on to the shifting track, the spring 153 expands and

pushes back the shoe, the sole of which again takes a position slightly inclined relatively to the rail.

The rod 162 also rises, and the cable 164 again becomes rigid or integral with the carriage 154 and with the shoe, owing to the pressure exerted on this cable by the claw 163 against the lower face of the table of the carriage 154.

The shape of the carriage and the mode of clamping of the cable are simply given by way of example, and could be carried out in other conditions without departing from the scope of invention.

The mechanism for the electric control of the brake-shoe is preferably devised as illustrated in Figs. 10 to 13.

The operating handle comprises a cylindrical drum 201, preferably made of aluminum, rigidly secured at its center on an axis 202, the ends of which rotate in bearings 203 and 204 secured on a frame 205, provided with a cup 206 in which are arranged two sets of induction coils 207M, 207*m*, 208R, 208*r*, which create a rotating field, causing the drum 201 to pivot on its axis 202, in one direction or the other, when an electric current is caused to pass through one of the groups of coils 207 or 208, by pressing on one of the operating buttons 209M or 209R which actuate the sets of contacts 210M or 210R.

A magnet 211 and a sheet-iron plate 212, which latter can be moved away from this magnet by means of an adjusting screw 213, are arranged on either side of the vertical cheek of drum 201, in order to permit of varying the magnetic field and to regulate the speed of rotation of the drum 201. Marked on the periphery of the drum 201 is a scale (Fig. 11) which is visible through a window 205*a* in a casing 205*b* and serves to indicate the distances from the point of deviation at which the brake shoe is to be brought onto the track. Such adjustment of the magnetic field makes it possible to cause the said scales to correspond exactly to the positions occupied by the brake-shoe on the track.

Rheostats 214M and 214R can be inserted in the circuit of the induction coils 207M, 207*m*, or 208R, 208*r*, for limiting the power of the rotating field they develop upon passage of the current.

A small plate 215 receives all the connections of the wires necessary for the operation of the apparatus.

Fig. 13 shows a diagram of the connections of an equipment of the braking apparatus controlled by this device.

It comprises the above-mentioned operating handle, placed in the operating station, which handle is diagrammatically shown in this figure by the drum 201, the sets of induction coils 207M, 207*m*, 208R, 208*r*, the rheostats 214M 214R, and the operating buttons 209M and 209R, one of which, 209M, controls the riding up of the shoe upon the track, and the other, 209R, controls the return of the shoe towards the end of the shifting track.

The equipment also comprises a relay provided with two coils 216 and 217 controlling both movements of rotation of the motor 218 driving the shoe.

The relay of the coil 216 has two sets of vanes 219 and 220, and that of the coil 217 has two sets of vanes 221 and 222. In the position of rest, the vanes 219 and 221 are spaced away from their contacts, and the vanes 220 and 222 rest on their contacts.

The equipment of the apparatus also comprises a contactor 223, placed at the entrance of the shifting track, which is actuated by the shoe when it passes during its return movement, and which momentarily closes the circuit of the electric relay for starting the motor in the suitable direction, in order to drive the shoe towards the rear part of the shifting track, until the shoe strikes the branch of a contactor 224 placed on the counter-rail, thus cutting off the current of the motor 218.

This equipment is completed by the adjunction of a contactor 225 placed at the end of the braking zone for limiting the stroke of the shoe.

The electrical operation of the apparatus is as follows:

By pressing upon the button 209M, the circuit I of the coil 216 is closed as follows: source C—conductor 226, fuse C^1—conductor 227, terminal 228—conductor 229—vane 210M, conductor 265, terminal 230, conductor 231—coil 216, conductor 232, terminal 263, conductor 264, vanes 233 and 234 of the contactor 225, conductor 235, terminal 236, conductor 237, fuse B^1, conductor 238, source B.

The pulling action of the coil 216 draws the vane 219 against the contacts closing the circuit II of the motor 218 actuating the cable.

Phase *a*: fed directly by the source A and the conductor 239.

Phase *b*: fed by: source B, conductor 240, terminal 241, conductor 242, contact 243, contact-piece 244, contact 245, conductor 246.

Phase *c*: fed by: source C, conductor 247, terminal 248, conductor 249, contact 250, contact-piece 251, contact 252, conductor 253.

The motor 218 rotates, as long as a pressure is exerted on the button 209M, in the required direction for drawing the cable and the shoe on the braking zone.

But during the same time, the following circuit III of the induction coils 207M and 207*m* of the operating handle is closed by:

Source C, conductor 226, fuse C^1, conductor 227, terminal 228, conductor 229, vanes 210M, conductor 265, terminal 230, conductor 254, coil 207M, conductor 255, coil 207*m*, conductor 256, rheostat 214*m*, terminal 257, conductor 258 contact 259, contact-piece 260, con-

tact 261, conductor 262, terminal 263, conductor 264, vanes 233 and 234 of the contactor 225, conductor 235, terminal 236, conductor 237, fuse B^1, conductor 238, source B.

The passage of the current in these coils creates a rotating field which causes the graduated drum 201 to rotate thus giving the indication of the position of the shoe on the braking zone.

When the pressure on the button 209M is released, or when the shoe passes beyond the contactor 225, the circuits I and III are opened by cutting the connection between the conductors 229 and 265, in the first case, and that between the conductors 264 and 235, in the second case. The pulling of the vane 219 ceases, the contact-piece 244 moves away from the contacts 243 and 245, and the contact-piece 251 moves away from the contacts 250 and 252, opening the circuit II of the motor 218.

The return backwards of the shoe, from its position on the track, and its re-entrance on the shifting track, can be obtained by causing the motor 218 to rotate in a direction reverse to that serving for the raising of the shoe, for putting in action the coil 217, the circuit of which can be closed either by the pressure exerted on the operating button 209R, or by the action of the contactor 223.

The closing of the circuit IV of the coil 217 by the pressure exerted on the button 209R is effected as follows:

Source C, conductor 226, fuse C^1, conductor 227, terminal 228, conductor 266, terminal 267, conductor 268, vane 210R, conductor 269, terminal 270, conductor 271, terminal 272, conductor 273, terminal 274, conductor 275, coil 217, conductor 276, terminal 277, conductor 278, vanes 279 and 280 of the contactor 224, terminal 236, conductor 237, fuse B^1, conductor 238, source B.

The pulling action of the coil 217 draws the vane 221 against its contacts, thus closing the following circuit V of the motor 218 which rotates in reverse direction to that in which it rotates when it is fed by the circuit II, owing to the reversal of the phases *b* and *c*:

Phase *a'*, directly fed by source A and conductor 239.

Phase *b'*, fed by: source B, conductor 240, terminal 241, conductor 281, contact 282, contact-piece 283, contact 284, conductor 285, terminal 286, conductor 253.

Phase *c'*, fed by: source C, conductor 247, terminal 248, conductor 287, contact 288, contact 289, contact 290, conductor 291, terminal 292, conductor 246.

But during the same time, the following circuit VI of the induction coils 208R, 208*r* is closed as follows:

Source C, conductor 226, fuse C^1, conductor 227, terminal 228, conductor 226, terminal 267, conductor 268, vane 210R, conductor 269, terminal 270, conductor 293, terminal 294, conductor 295, terminal 296, rheostat 214R, coils 208*r*, conductor 297, coil 208R, conductor 298, conductor 299, contact-piece 300, contactor 301, conductor 302, terminal 277, conductor 278, vanes 279 and 280 of the contactor 224, terminal 236, conductor 237, fuse B^1, conductor 238, source B.

The rotating field produced by the energization of these coils develop for causing the graduated drum 201 to rotate in a direction reverse to that in which it rotates when the circuit III is closed.

When the energization of the coil 217 takes place under the action of the contactor 223 upon return of the shoe, the following circuit VII is closed as follows:

Source C, conductor 226, fuse C^1, conductor 227, terminal 228, conductor 266, terminal 267, conductor 303, vane 304, conductor 305, terminal 306, conductor 307, vanes 308 and 309 of the contactor 223, conductor 310, terminal 272, conductor 273, terminal 274, conductor 275, coil 277, conductor 276, terminal 277, conductor 278, vanes 279 and 280 of the contactor 224, terminal 236, conductor 237, fuse B^1, conductor 238, source B.

Although the contact between the vanes 308 and 309 of the contactor 223 is only momentarily closed, the energization of the coil 217 remains maintained, because the current then passes through the following circuit VIII:

Source C, conductor 226, fuse C^1, conductor 227, terminal 228, conductor 266, terminal 267, conductor 303, vane 304, conductor 305, terminal 306, conductor 311, contact 312, contact-piece 313, contact 314, conductor 315, terminal 274, conductor 275, coil 217, conductor 276, terminal 277, conductor 278, vanes 279 and 280 of the conductor 224, terminal 236, conductor 237, fuse B^1, conductor 238, source B.

During the same time, the energization of the coils 208R and 208*r* of the operating handle is effected by the closing of the following circuit IX.

Source C, conductor 226, fuse C^1, conductor 227, terminal 228, conductor 266, terminal 267, conductor 303, vane 304, conductor 305, terminal 306, conductor 311, contact 312, contact-piece 313, contact 314, conductor 315, terminal 274, conductor 273, terminal 272, conductor 271, terminal 270, conductor 293, terminal 294, vane 316, conductor 317, coil 208*r*, conductor 297, coil 208R, conductor 298, contact 299, contact-piece 300, contact 301, conductor 302, terminal 277, conductor 278, vanes 279 and 280 of the contactor 224, terminal 236, conductor 237, fuse B^1, conductor 238, source B.

As the current does not pass through the rheostat 214*r* for passing into the coils, the rotation of the graduated drum 201 is more rapid and the graduation comes back to the

initial point during the very short time taken by the shoe for travelling over the distance separating the contactors 223 and 224. The driving apparatus is ready for a new operation.

When the shoe reaches the branch of the contactor 224, this branch moves the vanes 279 and 280 away, thus breaking the circuits IV, VII or VIII of the coil 217, and the circuits VI, or IX of the coils 208R, 208r of the handle.

The induction of the coil 217 being broken, the pulling of the vane 221 against its contact ceases and the circuit V of the motor 218 is opened, the contact-piece 283 moving away from the contacts 282 and 284 by opening the phase b' and the contact-piece 289 moving away from the contacts 288 and 290 by opening the phase c'.

The drum 201 above described can be advantageously replaced by a disc actuated in a similar manner and bearing the required graduation on one of its faces.

Claims:—

1. In a brake-shoe with electro-mechanical control for the braking of waggons on shifting tracks, the combination of a main track, a siding track, a shoe adapted to slide on the two tracks, an endless cable adapted to draw the said shoe on to the main track and a spring clip for coupling said shoe with said cable.

2. In a brake-shoe with electro-mechanical control for the braking of waggons on shifting tracks, the combination of a main track, a siding track, a shoe adapted to slide on the two tracks, an endless cable adapted to draw the said shoe on to the main track a spring clip for coupling said shoe with said cable and means for releasing said clip under the action of the contact between one wheel of a waggon and the said shoe.

3. In a brake-shoe with electro-mechanical control for the braking of waggons on shifting tracks, the combination of a main track, a siding track, a shoe adapted to slide on the two tracks, an endless cable adapted to draw the said shoe on to the main track a spring clip for coupling said shoe with said cable, said clip comprising a lower jaw connected to the shoe, a spring piston guided in cavity of said shoe, a pedal lever adapted to control the said piston and linked on said shoe, said lever being arranged as to be controlled by the wheel of a waggon when it strikes against said shoe.

4. In a brake-shoe with electro-mechanical control for the braking of waggons on shifting tracks, the combination of a main track, a siding track, a shoe adapted to slide on the two tracks, an endless cable adapted to draw the said shoe on to main track a contact device placed at the beginning of the siding track and arranged as to be controlled by the said shoe, a motor adapted to be inserted in the circuit by the said contact device and to draw the said cable on the siding track.

5. In a brake-shoe with electro-mechanical control for the braking of waggons on shifting tracks, the combination of a main track, a siding track, a shoe adapted to slide on the two tracks, an endless cable adapted to draw the said shoe on to the main track a contact device placed across the stroke of said shoe near the end of the siding track and adapted to cut out the electric current at the return stroke of the shoe before the latter arrives at this end.

6. In a brake-shoe with electro-mechanical control for the braking of waggons on shifting tracks, the combination of a main track, a siding track, a shoe adapted to slide on the two tracks, an endless cable adapted to draw the said shoe on to the main track an indicating device for the upward stroke of said shoe said indicator comprising an electric three-phase motor, an index upon a graduated scale adapted to be controlled by the said motor, two insulated drums comprising each a conducting sector and an insulated sector two contact pieces adapted to rub upon said sectors and adapted to cut out two phases of said motor at rest.

7. In a brake-shoe with electro-mechanical control for the braking of waggons on shifting tracks, the combination of a main track, a siding track, a shoe adapted to slide on the two tracks, an endless cable adapted to draw the said shoe on to the main track a control handle placed in the control house and comprising a graduated drum, bobbins with rotating field adapted to rotate said drum, the circuits of the said bobbins being controlled by means of hand switches and their action being regulated in such a manner that the drum rotates in correlation with a cable driving motor and indicates in this manner the value of the displacements of the shoe.

In testimony whereof I have hereunto affixed my signature.

FERNAND DELOISON.