

Feb. 19, 1924.

1,484,086

F. H. RUTHERFORD

SWITCHING APPARATUS FOR RAILWAY SWITCH YARDS

Filed June 24, 1922

4 Sheets-Sheet 1

Fig. 1

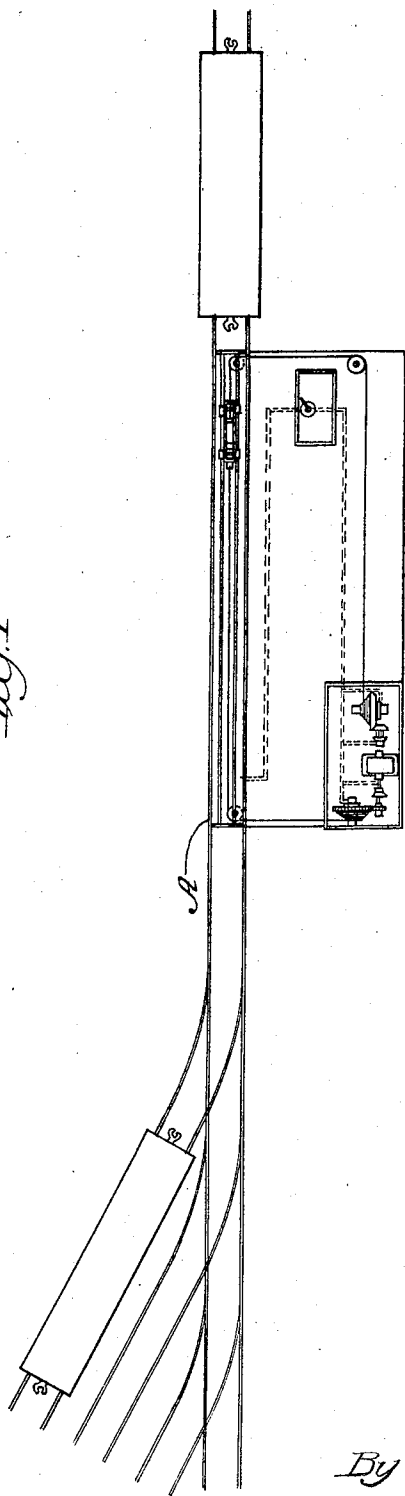
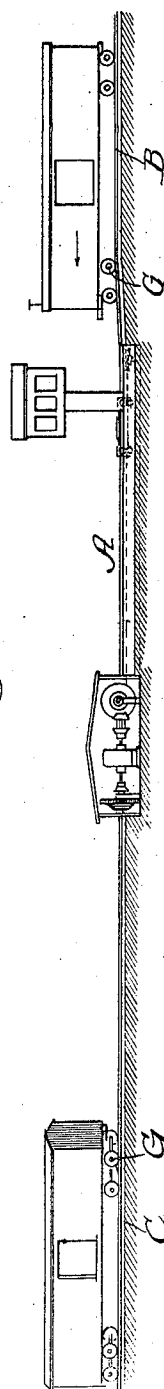


Fig. 2



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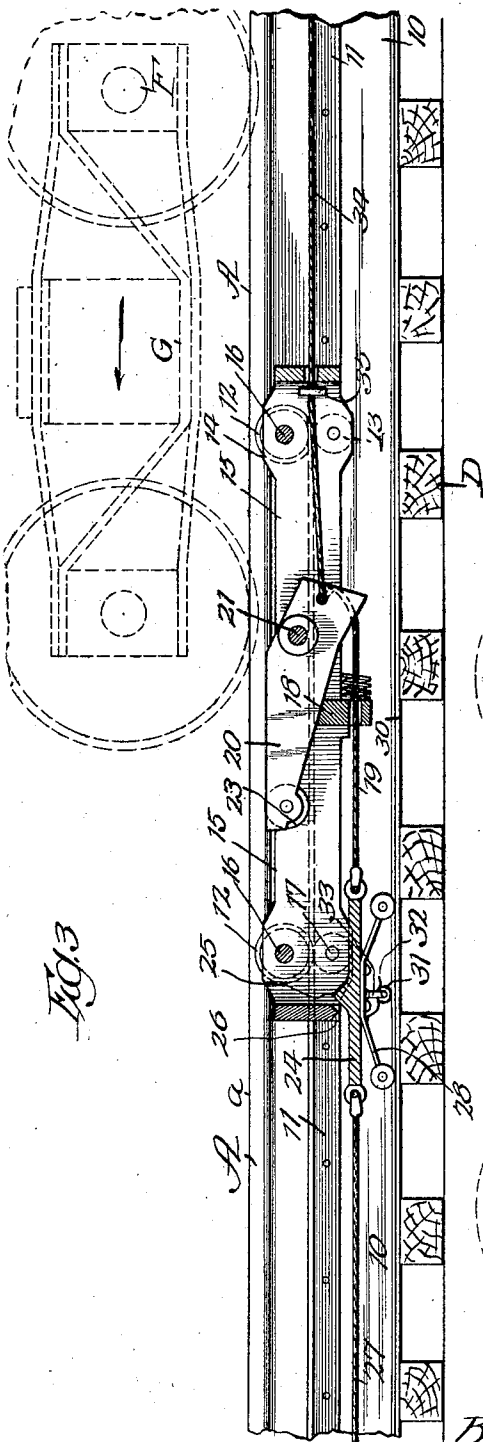
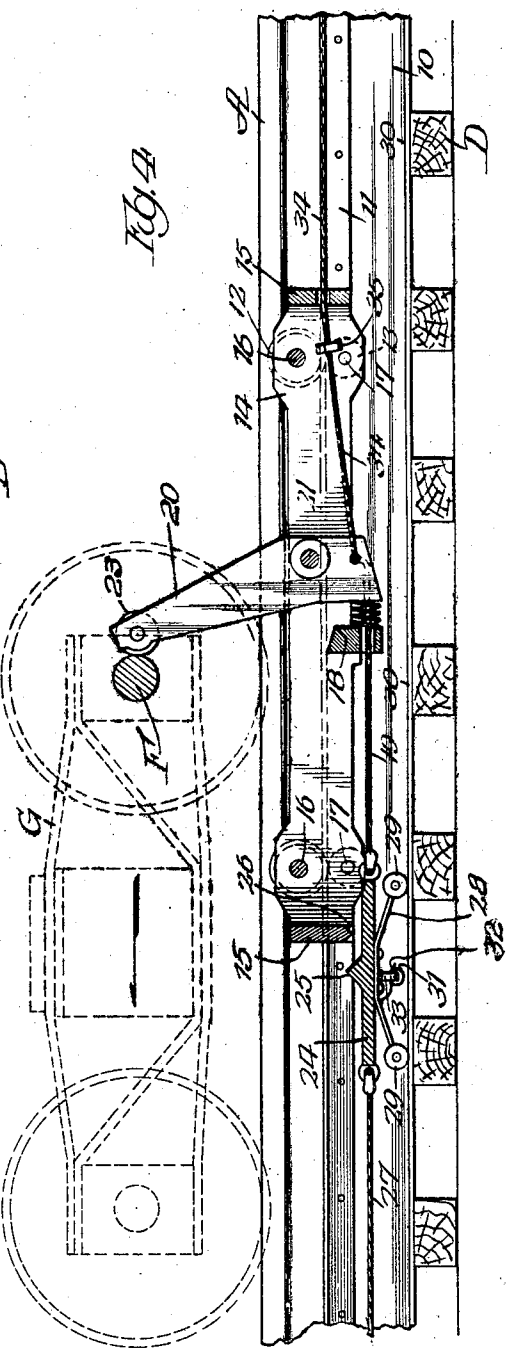
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SWITCHING APPARATUS FOR RAILWAY SWITCH YARDS

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4 Sheets-Sheet 2



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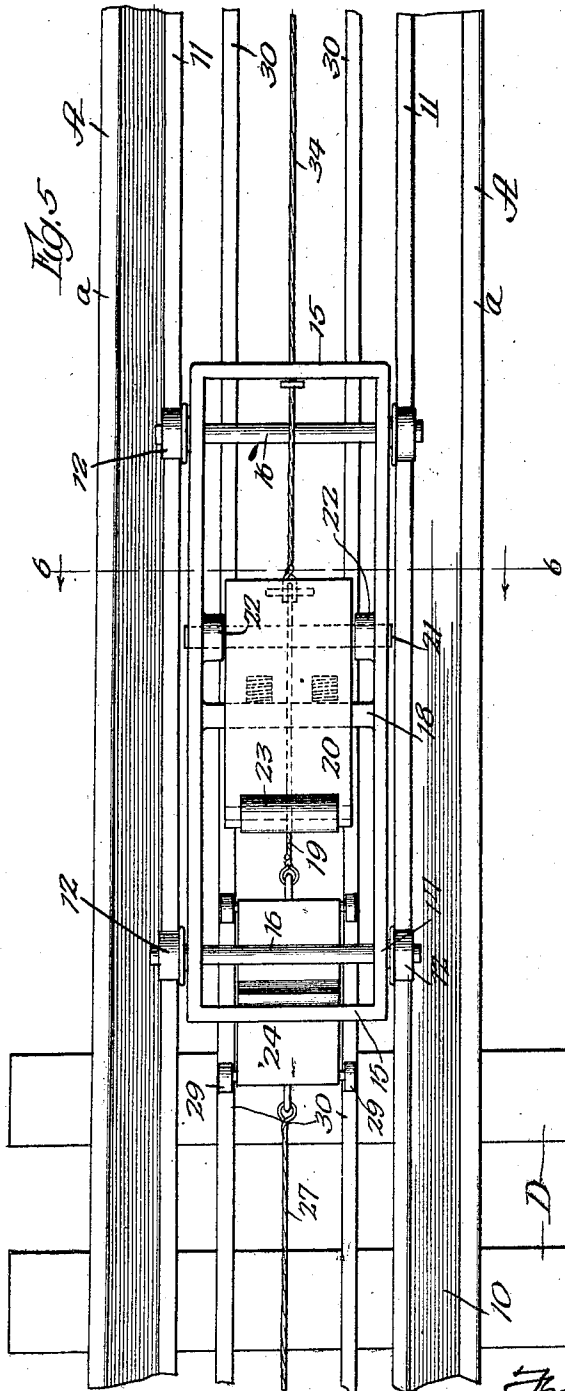
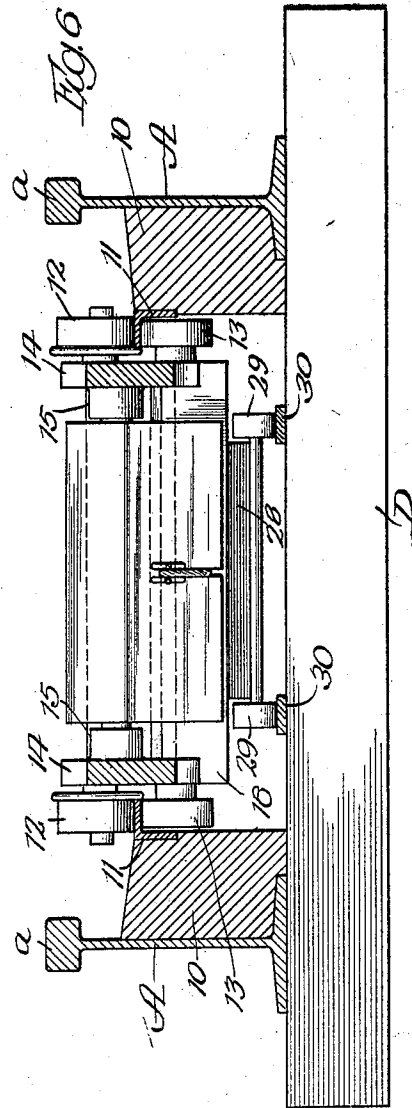
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SWITCHING APPARATUS FOR RAILWAY SWITCH YARDS

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4 Sheets-Sheet 3



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1,484,086

SWITCHING APPARATUS FOR RAILWAY SWITCH YARDS

Filed June 24, 1922

4 Sheets-Sheet 4

Fig. 7

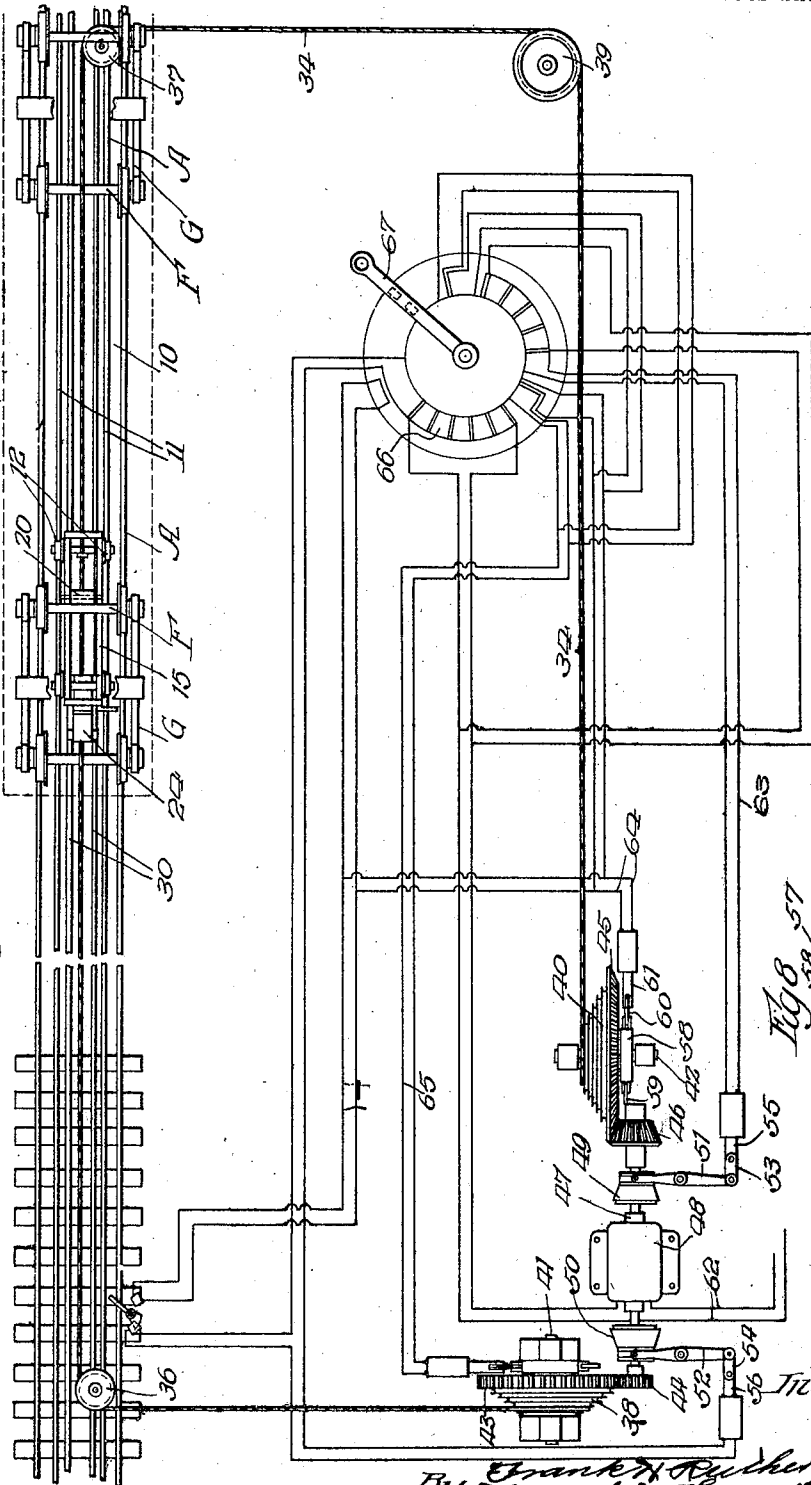
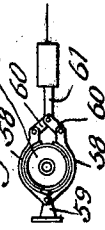


Fig. 8



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UNITED STATES PATENT OFFICE.

FRANK H. RUTHERFORD, OF CHICAGO, ILLINOIS.

SWITCHING APPARATUS FOR RAILWAY-SWITCH YARDS.

Application filed June 24, 1922. Serial No. 570,638.

To all whom it may concern:

Be it known that I, FRANK H. RUTHERFORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Switching Apparatus for Railway-Switch Yards, of which the following is a full, clear, and exact description.

My invention relates to switching apparatus for railway switch yards and particularly for switching freight cars to make up new trains.

Heretofore this switching, principally has been done by hand and by switching humps or hills. The former is very slow and the more or less dangerous and the second method is unsatisfactory because of the inability to control the speed of the cars as they drift from the hump or hill.

The object of my invention is to switch cars quickly and with safety under the control of one man, after they have been placed within the range of his control. This I accomplish by the means hereinafter fully described and as particularly pointed out in the claims.

In the drawings:

Figure 1 is a diagrammatical general view of my invention.

Figure 2 is a side view of the same.

Figure 3 is a longitudinal central section of the pilot car used in connection with said invention showing the pusher arm in one position, segregated, and drawn to a larger scale.

Figure 4 is a similar view showing said arm in the opposite position.

Figure 5 is a plan view of Figure 3.

Figure 6 is a transverse section taken on dotted line 6, 6, Figure 5.

Figure 7 is a plan view of the actuating mechanism drawn to a larger scale than in Figure 1.

Fig. 8 is a detail of the electrical solenoid brake mechanism.

In the drawings A, A, represent the rails of a railway track, which, for a certain portion of its length, say, two hundred feet, are higher than the rails of the tracks B and C, used in connection with my improvements and are supported by depressed ties D within the area of said portion which is depressed.

Secured in any suitable manner to the inside surface of rails A, A of said depressed

area are corresponding longitudinal sleepers 10, the upper surfaces of which incline from the rails to their inner vertical sides, where they are provided with angle-irons 11 secured or bolted thereto, so that their horizontal portions overhang the inner vertical sides of the sleepers, and project toward each other in substantially the same plane. These sleepers 10 and angle-irons 11 extend the entire length of the depressed portion of the track, and the angle-irons serve as tracks for the wheels 12 and 13 of a pilot-car.

This pilot-car comprises suitable sidesills 14 and endsills 15, that connect the ends thereof. The axles 16 of the wheels 12 are journaled in the sidewalls of the pilot-car, and are, preferably, flanged and retained upon the angle-irons 11 by the wheels 13 that are mounted upon studs 17 projecting laterally from the sideframe.

At about their centers of length, the sidesills are connected by a transom 18 or cross-bar, the lower edge of which depends below the plane of the axle 16 and below the lower edges of the sidesills. This transom is perforated, and a cable 19 extends therethrough and has its rear end secured to the lower portion of a lever 20. Lever 20 is fulcrumed on a transverse bar 21, whose ends are journaled in bearings 22, 22, in the sideframes of the pilot-car at points, preferably, above the plane of the cross-bar 18. The width of this lever corresponds to the distance between the bearings 22, 22, and when raised, it is of a height corresponding a little higher than the axles F of an overhead freight car. It has a roller 23 journaled in its bifurcated end, that, as will be hereinafter more fully explained, engages the axle when the lever is up. The cable 19 is attached to the lower shorter arm of this lever and between said lever and the transom 18 a coil spring 27 is interposed so as to provide a yielding contact for the lower portion of the lever which comes in contact therewith. Cable 19 when the lever is up extends from said lever to a point immediately under axle 16 and is attached in any suitable manner to the adjacent end of a small truck 24. This truck consists of a rectangular platform, which is, preferably, of a width less than that of lever 23, and is of a length extending beyond the adjacent endsill 15 of the pilot-car. At its center of length it is provided with a transverse ridge 25 the sides

of which incline from a point that is normally above the horizontal plane of the lower edge of said endsill 15.

The platform of this truck 24 is normally just below the lower edge of the adjacent sill of the pilot-car, which latter has its lower edge 26 preferably bevelled or sharpened and said truck has a pulling cable 27 secured to the front edge thereof, substantially midway its longitudinal sides.

The truck 24 is supported in such position that, as it reciprocates, the hump 25 will engage the lower bevel edge 26 of the endsill of the pilot-car, and be depressed. Its support consists of a plate of spring steel 28 or other elastic medium that has four small wheels 29 suitably journaled to its ends. These wheels normally engage and roll upon tracks 30, which latter consists, as shown in the drawings, of flat bars of metal secured to ties D midway between the rails A, A, of the track. Truck 24 has arms 31, 31, pivotally secured to and depending down from its center of length, and these arms have a roller 32 journaled in their lower ends. These arms are prevented from oscillating forward by a suitable stop 33 secured to and depending from the bottom of the truck, in position to be engaged thereby, but can oscillate to the rear which prevents its oscillating forward from its vertical position. The length of arms 31 and the dimensions of the roller 32 are such that, when said truck is in its normal plane, the roller will not engage tracks 30, and its disengagement occurs when the truck is being drawn forward. When the truck is moved to the rear and depressed by the endsill 15, roller 32 will come in contact with the rails 40 while the arms are in a vertical position, and limit the downward depression of the truck.

The lower shorter arm of the lever 20, below its fulcrum 21, has a cable 34 attached thereto that extends to and through a suitable aperture in the rear endsill of the pilot-car. This cable is drawn rearward to return the pilot-car to its original position and it has thereon a suitable stop 35, which engages the rear endsill, when the cable has been moved far enough to return the lever 20 to the horizontal position shown in Figure 3 of the drawings.

The pulling cable 27 and the return cable 34 extend to the ends of the depressed area in which the tracks A, A, are placed, and the former passes around a horizontal sheaf 36 and the latter around a horizontal sheaf 37. After leaving the sheaf 36, cable 27 extends laterally to and around a grooved conical drum 38 and the cable 34 extends laterally to and around a sheaf 39 and then to a conical grooved drum 40. The shafts 41 and 42 of drums 38 and 40 are suitably journaled, and the major axis of drum 38

has a spur gear 43 keyed thereto that engages a pinion 44, and the major axis of drum 40 has a bevel-gear 45 keyed thereto that engages a bevel pinion 46 on the same shaft 47, at the opposite end of which pinion 44 is keyed. Shaft 47 is actuated by an electric motor 48, and between said pinions 44 and 46 and said motor 48, it is provided with friction clutches 49 and 50. The loose members of these clutches are engaged by the ends of levers 51 and 52 substantially as shown, and the opposite ends of these levers are connected, through the medium of links 53 and 54 with solenoids 55 and 56.

On shafts 41 and 42 of the drums, between the major axes of said drums and the adjacent brake disks 57, and these disks are engaged circumferentially by segmental shoes 58, 58, which are pivoted at one end, preferably, to the same lug 59, and have their opposite ends connected by links 60 to a solenoid 61.

The motor, the clutches, and the brakes are connected by means of separate electrical circuits 62, 63, 64, and 65, to an electrical controlling device, 66, by manipulating the handle 67 of which said drums are actuated according to the desire of the operator. I do not herein claim the control-device 66, which will be made the subject of a separate application. Any electrical controlling apparatus, capable of accomplishing the objects of my invention, will answer.

The cable 27 is wound upon drum 38 in a different direction from that in which cable 34 is wound upon drum 40, thus when the brake disks 57 are released, the motor actuated, and the clutches closed, the drums will be revolved and the said cable 27 will first pull the lever 20 into a vertical position and move the truck under and to the front of the front endsill. Before this is done the truck of the railway car, it is desired to drift onto one of the switch tracks, substantially as shown in Figure 1 is moved over the pilot-car, and when the lever 20 is raised and said pilot-car is drawn forward by the cable 27, said lever engages the axle of the railway car and pushes it forward until the car is near the end of the depressed area between the rails A, A, of the track, whereupon the operator applies the brakes, and reverses the drums, whereupon the cable 34 pulling upon the lever moved into the horizontal position, as shown in Figure 3, and the stop 35 thereon engages the rear endsill of the pilot-car and moves the same back to its original position, ready for engagement of the axle of the truck of the next railway car. This reverse movement of the pilot-car is done very swiftly in order to expedite the work, and the cars of a freight train can be quickly disengaged from the train and scattered onto the switch-tracks to re-

form them into other freight trains, without the danger to the switchmen as at present experienced. My invention dispenses with the use of the switchmen employed in the drifting of the freight cars, and is not only economical in the matter of labor, but also does the work in a much quicker and easier manner.

I do not desire to be confined to the exact details of construction of my improvements as hereinbefore described, and arranged, as it is apparent the parts thereof may be changed in construction without departing from the spirit of my invention.

What I claim as new is:

1. In a freight car drifting apparatus, a section of railway track, a truck reciprocal longitudinally between the rails thereof, a lever on said truck oscillatory from a horizontal to a vertical position, and in the latter position adapted to move a railway car by engaging an axle of the truck thereof, a brake for said truck, and traction cables correlated with said lever and brake whereby one is thrown into operation and the other out.

2. In a freight car drifting apparatus, a section of railway track, a lever oscillatory from a horizontal to a vertical position, and in the latter position adapted to move a car by engaging an axle of the truck thereof, means for retarding the movement of said lever when in a horizontal position and cables for moving said lever in either direction and operating said retarding means.

3. In a freight car drifting apparatus, a section of railway track, a pilot-car running longitudinally in opposite directions between the rails of said track, a lever fulcrumed between the sides of the same, cables extending from the ends of said pilot-car in opposite directions, said lever when the pilot-car is moved in one direction being in a horizontal position, and when moved in the opposite direction arising to a vertical position and engaging and pushing against the overhead structure of a railway car, and means for retarding the movement of said pilot-car when moving with the lever in a horizontal position.

4. In a freight car drifting apparatus, a section of railway track, a pilot-car running longitudinally in opposite directions between the rails of said track, a lever fulcrumed between the sides of the same, cables attached to the lower end of said lever and extending from the ends of said pilot-car in opposite directions, said lever when the pilot car is moved in one direction being in a horizontal position, and when said car is moved in the opposite direction arising to a vertical position and engaging and pushing against the overhead structure of a railway car, and an auxiliary brake truck associated with said pilot-car and interposed in the

cable for moving said lever-arm to horizontal position.

5. In a freight car drifting apparatus, a section of railway track, a pilot-car running longitudinally between the rails of said track, a lever fulcrumed between the sides of the same, cables attached to the lower end of said lever, and a stop-button on the cable that draws the car to the rear between said lever and the rear endsill of said car, said cables extending from the ends of said pilot-car in opposite directions, and said lever when the pilot-car is moved in one direction being in a horizontal position, and when said car is moved in the opposite direction arising to a vertical position and engaging and pushing against the overhead structure of a railway car.

6. In a freight car drifting apparatus, a section of railway track, a narrower track, midway between the same, a pilot-car the wheels of which engage the narrower tracks, a lever fulcrumed between the sides of the said pilot-car, a transom connecting said sides, and cables connected to the said lever and extending in opposite directions from the car, said lever when said car moves in one direction being horizontal and when moved in the opposite direction being raised and engaging said transom.

7. In a freight car drifting apparatus, a section of railway track, a pilot-car, a lever fulcrumed between the sides of said car, a transom connecting the sides of the car, cables connected to the said lever and extending in opposite directions therefrom, and a truck connected to the cable extending forward from the lever, said truck being depressed as it is moved under the front end of said car, said lever when the car moves to the rear being horizontal and when it is moved forward being vertical.

8. In a freight car drifting apparatus, a section of railway track, a narrower track between the rails thereof, a pilot-car the wheels of which engage said narrower track, a lever fulcrumed between the sides of said car, cables secured to and extending in opposite directions from said lever, a transom connecting the sides of the car and engaged by said lever when in a vertical position, a truck connected to the forwardly extending cable and extending beneath the front end thereof, and a spring for raising the truck to its normal position after it has been depressed by the said front endsill of the pilot-car.

9. In a freight car drifting apparatus, a section of railway track, a narrower track between the rails thereof, a pilot-car the wheels of which engage said narrower track, a lever fulcrumed between the sides of said car, cables secured to and extending in opposite directions from said lever, a transom connecting the sides of the car that is

engaged by said lever when in a vertical position, a truck connected to the forwardly extending cable, and extending beneath the front endsill of the pilot-car, a spring for
5 raising the truck to its normal position after it has been depressed by said front end, and means for limiting the downward movement of said truck.

10 10. In a freight car drifting apparatus, a section of railway tracks, a device reciprocal longitudinally between said tracks which is below the structure of a railway car when moving in one direction and which arises
15 when moved in the opposite direction and engages the car structure and pushes it along, cables for moving said device in either direction, drums on which the ends of said cables are wound, means for actuating the same, and brake devices for retarding
20 the movement of said reciprocable device when in a recumbent position.

11. In a freight car drifting apparatus, a

section of railway tracks, a device reciprocal longitudinally between said tracks which is below the structure of a railway car when
25 moving in one direction and which arises when moved in the opposite direction and engages the car structure and pushes it along, cables for moving said device in either direction, drums on which the ends
30 of said cables are wound, a spur-gear on one of said drums, a bevelled gear on the other, a motor driven shaft having a pinion on one end and a bevelled pinion on the other connecting said gears, clutches on said
35 shaft on each side of the motor, brakes on the shafts of the drums, and electrical means for operating the same.

In witness whereof I have hereunto set my hand this 13th day of June, 1922.

FRANK H. RUTHERFORD.

Witnesses:

FRANK D. THOMASON,
VIOLET WARDELL.