(No Model.) 4 Sheets—Sheet 1.

G. H. SPRING.

STORE SERVICE SYSTEM.

No. 306,547. Patented Oct. 14, 1884.

Fig. 1.

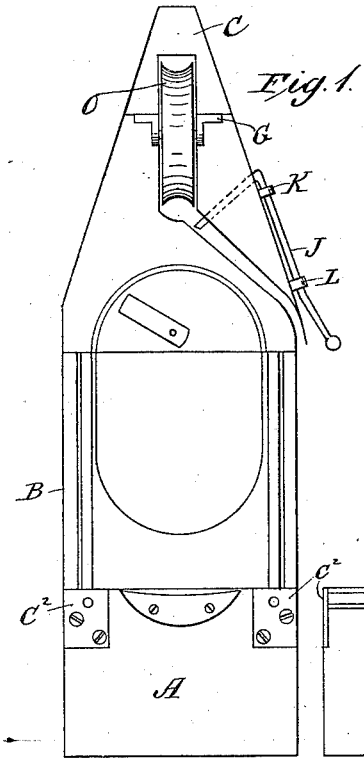


Fig. 2.

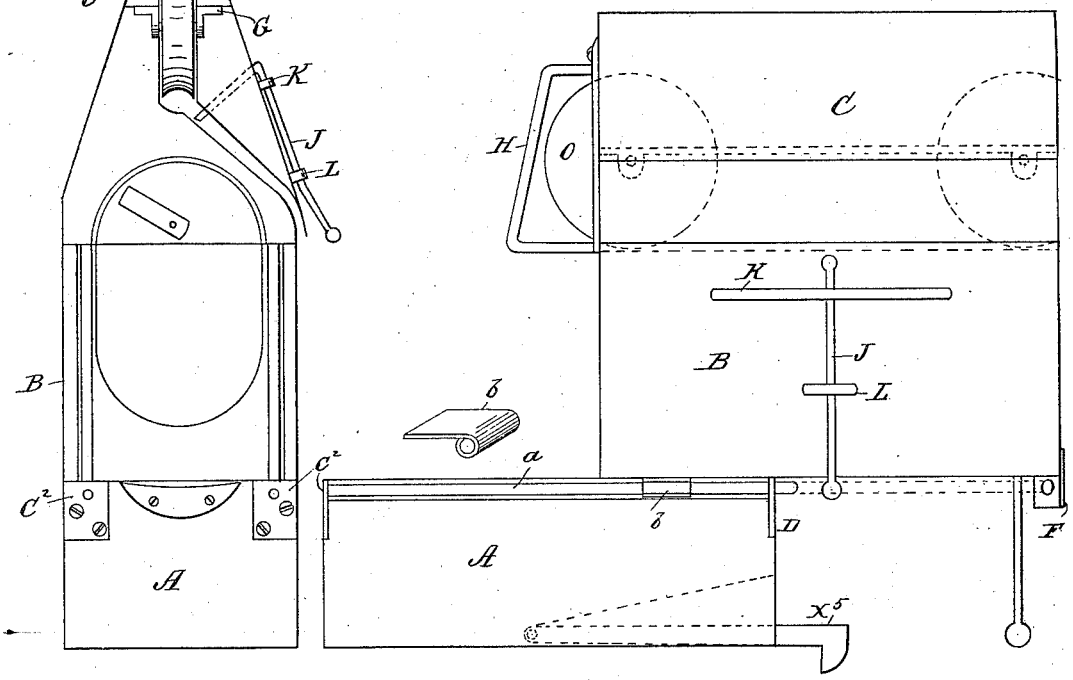


Fig. 3.

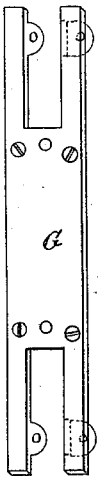
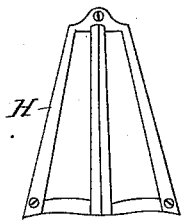


Fig. 4.



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STORE SERVICE SYSTEM.

No. 306,547. Patented Oct. 14, 1884.

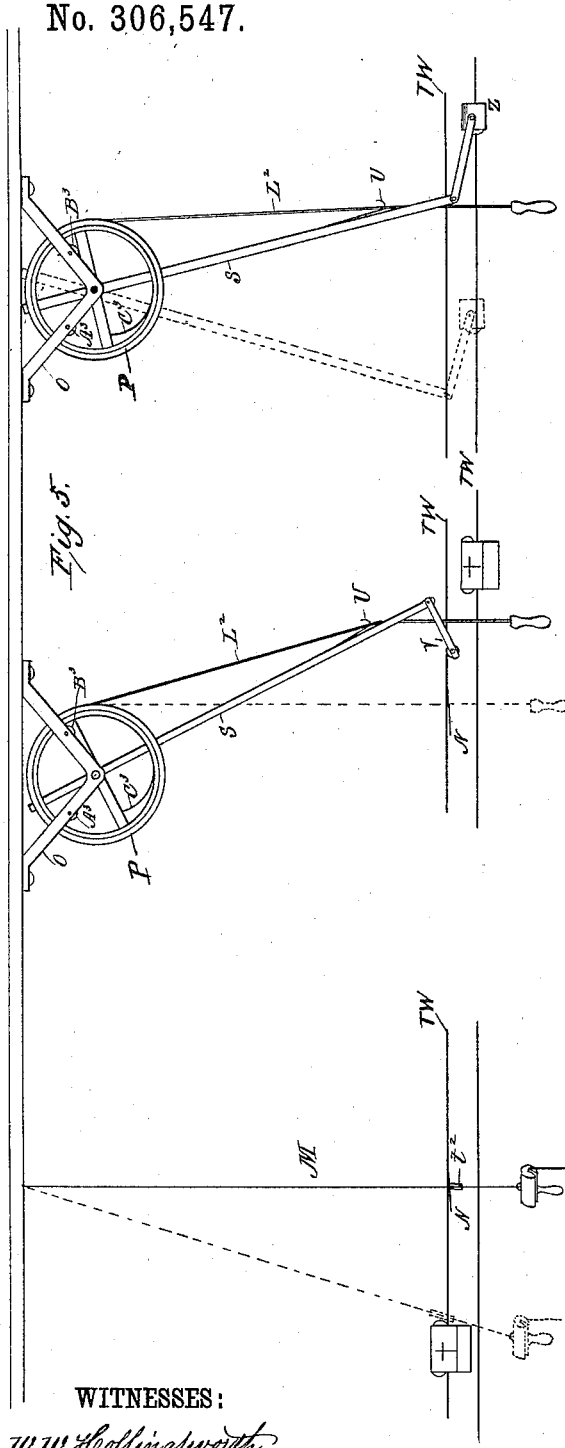

Fig. 8.

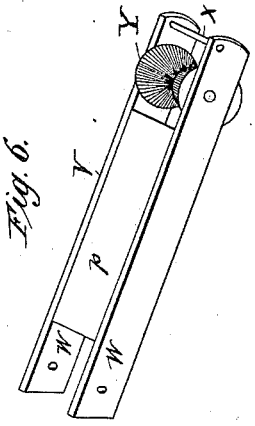

Fig. 6.

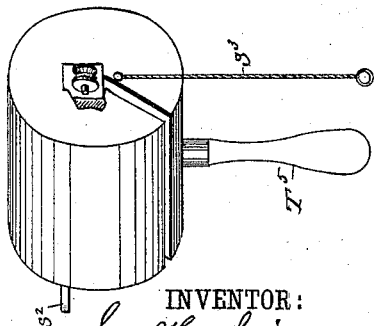

Fig. 9.

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STORE SERVICE SYSTEM.

No. 306,547. Patented Oct. 14, 1884.

Fig. 7.

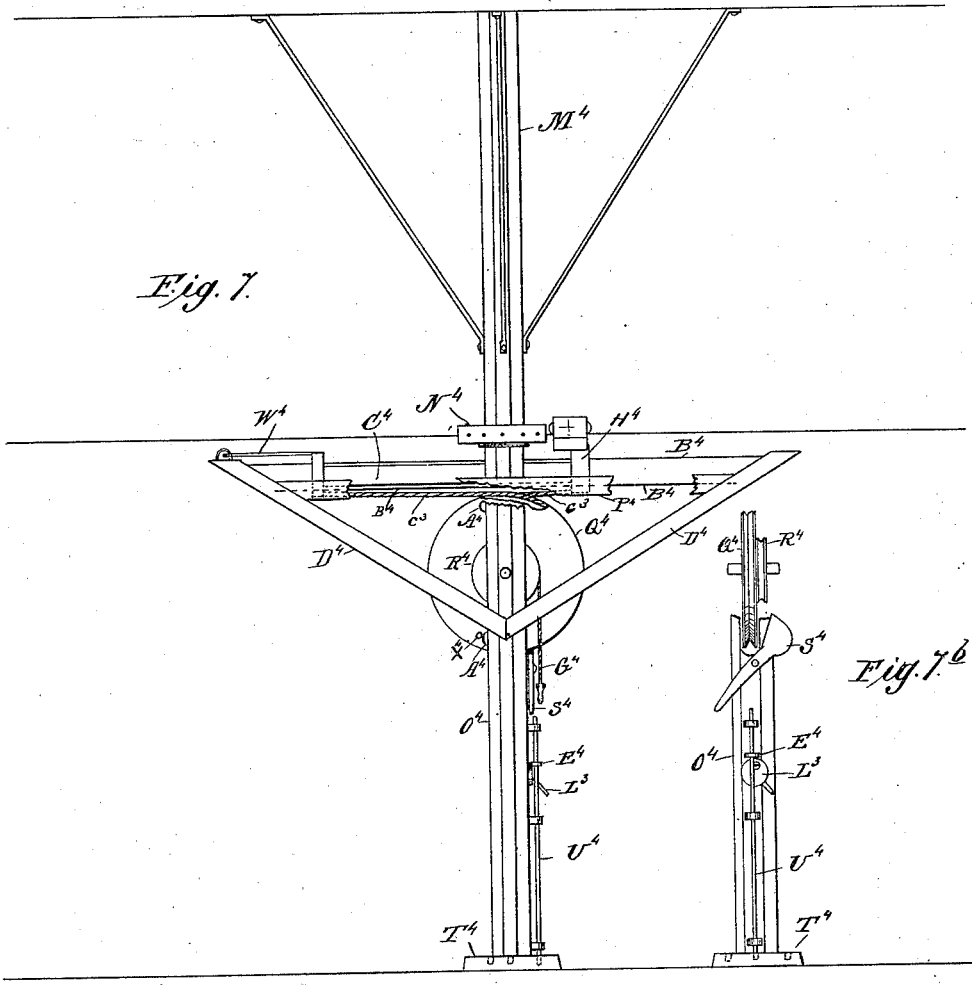
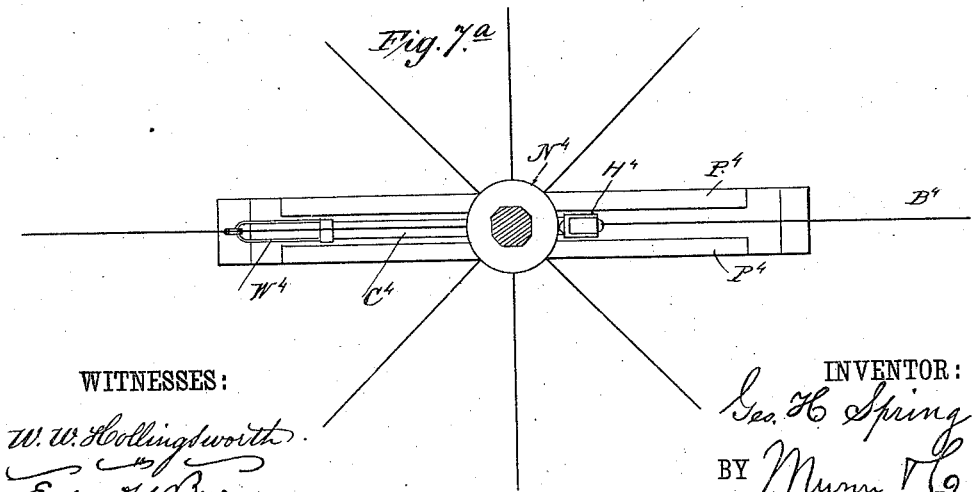


Fig. 7b.

Fig. 7a.



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(No Model.) 4 Sheets—Sheet 4.

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STORE SERVICE SYSTEM.

No. 306,547. Patented Oct. 14, 1884.

Fig. 8 a.

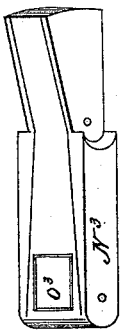
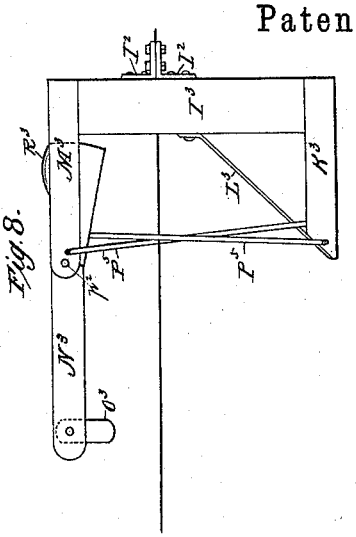


Fig. 8.



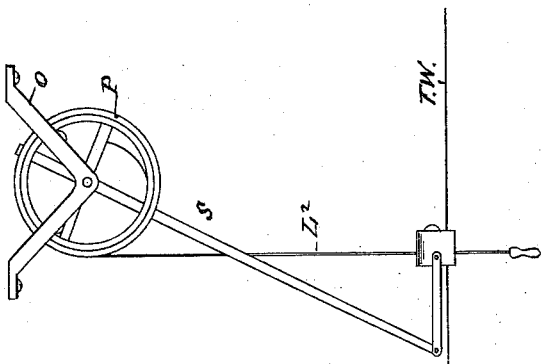


Fig. 10.

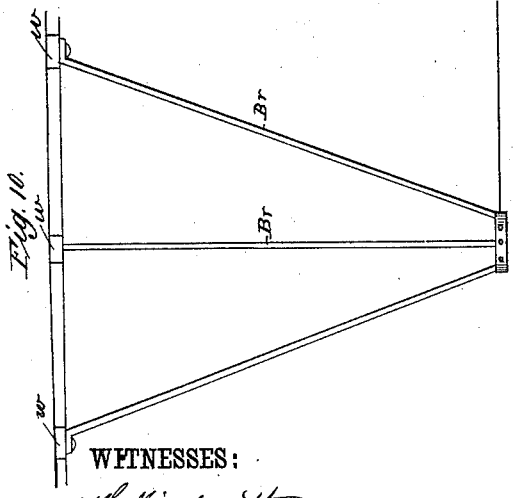


Fig. 11.

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UNITED STATES PATENT OFFICE.

GEORGE H. SPRING, OF LEMARS, IOWA.

STORE-SERVICE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 306,547, dated October 14, 1884.

Application filed June 30, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. SPRING, a citizen of the United States, residing at Lemars, in the county of Plymouth and State of Iowa, have invented a new and useful Improvement in Store-Service System, of which the following is a description.

Figure 1 is an end and Fig. 2 a side view of the cash-carrier, the latter being shown open in Fig. 2. Fig. 3 is a perspective view of plate G. Fig. 4 is a detail of guard H. Fig. 5 are views of different stations on the line, showing forwarders and receivers. Fig. 6 is a detail of the lower portion of the forwarder. Fig. 7 is a side elevation of my general forwarder. Fig. 7^b is a view at right angles to that given in Fig. 7 of the post and its connection. Fig. 7^a is a plan view of Fig. 7, with post M^4 in section. Fig. 8 is a side view of the car receiver and retainer. Fig. 8^a is a perspective view of the tongue N^3. Fig. 9 is a perspective view of the hand forwarder. Fig. 10 is a view of the wire-support and a forwarder, and Fig. 11 is a side view and cross-section of the track-wire.

My invention relates to certain improvements in a cash-carrier for store-service system, which carrier is used on a suspended horizontal wire, (for which I have previously made application for a patent, which was allowed January 30, 1884;) and it relates also to new and better means for propelling the carriers on such lines from station to station, and to new and improved attachments to such lines for detaining the carriers where desired upon them; to an improvement upon the track-wire, and also certain devices and mechanical arrangements for a cashier's office in connection, rendering it possible and convenient to receive there the cash, &c., from various quarters or portions of a store or counting-house, and the ready return of the change to those sending from such quarters.

Referring to Figs. 1, 2, 3, and 4, A B C represent the cash-carrier, which in general construction resembles the carrier already described in my allowed application. Instead, however, of connecting A B by a tongue-and-groove connection, I cut a groove in the upper portion of the sides of A. Then, slipping the threaded end of a No. 8 brass wire, *a*, through the brass cylinder *b*, as shown, I fasten the cylinder by screws onto the under side of B, and do the same with like parts on the other side of the carrier. I then fasten the front brass brackets, C^2, in position, as shown, which have holes in them threaded to match the threaded ends of the wires, which I screw into them. Then brackets D, corresponding with the front ones, but with smooth instead of threaded holes, are slipped onto the rear ends of the wires, and are screwed to A, so as to be flush or square with its rear end. Then a similar bracket, F, is slipped over the tapered rear end of each wire, and fastened to B by screws just above it, keeping these sections from any liability of slipping sidewise. The section B can then slip back or forward freely over A, the cylinders slipping on the wires freely without binding, and avoiding also the danger of getting out of repair which was realized from the breakage of the slight tongues used before, which this cylinder and wire method is designed to supplant.

G is a malleable-iron truck-plate designed to hold the pulley-wheels O in my carrier in exact line with each other, to render their action more free and perfect, and to strengthen the upper part of section B by being screwed to its upper surface, to which it is fitted before the section C is finally screwed down upon it, the screws passing through holes left in this truck-casting, as shown.

H is a malleable-iron skeleton guard or shield projecting beyond the pulley O, and is adapted and used to receive the forward motion from the lever-stroke of my new propeller. (Later explained.) It is attached to the end of B and C, as shown in Fig. 2.

J is a brass wire bent and formed to serve as the lever part of a spring, as shown, its upper hooked end being passed through a hole in the side of B.

K is the spring proper, which is made of brass, and is placed over J in such a way with its ends inserted in slits in the sheet-brass roof of the carrier as to keep it in place and cause it to serve its purpose. The inside end of the lever-wire J is tapered on the outside, so that it forms no obstruction to the passage of the

track-wire in under the pulleys as the car is put upon it; but it effectually prevents the derailment of the car under any circumstances, and can be raised by pressure on its lower end in the first motion in taking the carrier from the track.

L is a bridge to the lever-wire J, holding it in place, but allowing it needed play as the lever is pressed down in action. It is made of sheet-brass, and is soldered to the brass roof of carrier.

X^5 is a tongue pivoted at its rear end in a narrow groove in the bottom of the lower section of a cash-car, so that its front end will project before and its hooked part slightly balance the car, also adapting it to be slipped into a groove in a forwarder.

I now refer to Fig. 5, showing means for detaining the carrier and also for propelling it.

N is a straight-pointed horizontal hook of wire, a portion of which is soldered onto the under side of the track-wire T W (the one which brings carriers from the cashier's office) at intermediate or way stations, and is used as a detainer there in connection with a line, M, suspended from above, having a piece of elastic rubber tubing, t^2, attached to it, which, being passed between the main wire and the detaining-wire hook N, the rubber being beneath the hook, serves as a flexible detainer for the carrier, and is mainly useful when the salesman is for a few moments called away from his post. When he is there in waiting, the very best mode of detention is for him to hold the suspended line against the track-wire from below at such an angle, as shown by dotted lines, that the bottom of the coming carrier will first strike it, when it will yield a little without causing any rebound, leaving the carrier instantly at the command of the salesman, instead of being wedged upon the wire, as with my former detainers, which proved also a severe strain upon the carriers when sent with force. This method of detention avoids that strain and makes the amount of surplus force used or the needless velocity of the carrier a matter of indifference.

Fig. 5 illustrates, on the right hand, in two places, (because of two varying foot attachments to the lower ends of the levers, for reasons given later,) my improved lever-stroke carrier-forwarder.

O is a cast-iron frame, having flanges by which it may be attached to a plate-board, which may be secured by screws to the ceiling, or to some other conveniently distant basis. This frame-casting is adapted to receive and hold the cast-iron pulley-wheel P, which is nicely fitted at its hub to run very truly as it is partially revolved. This wheel has an extra weighted front side, C^3, designed, when unrestrained, to weigh down that portion of the wheel, and so to bear up the lower end of the wooden lever S. This lever, in its upper portion, passes through openings in the upper and lower rim of the wheel, and is pivoted upon the pin which secures the center of the wheel to the frame-casting, as mentioned.

L^2 is a cord attached to the short end of the lever S, which passes partially back and down over the wheel, having a handle attached to its lower end, as shown. By pulling this down the wheel is partially revolved, so that the lower lever-arm is moved forward sufficiently to give the needed stroke to forward a carrier upon the wire track. This stroke, however, is limited by the forward spoke of the wheel coming in contact with a rubber ball, A^3, bolted between the open sections of the frame-casting, which acts as a bumper and arrests the further forward revolution of the wheel, when, with its duty done, the weight causes the forward side of the wheel to descend and the lever automatically to return to its required position above the track-wire, the return-stroke being limited by the location of another rubber ball, B^3, where required to stop it by contact with the rear spoke that comes against it.

U is a down-sloping screw-hook attached to the lever where shown, so that when the operator drops his line on that side of the lever it slides into the hook, which thus suspends it midway between the adjoining track-wires, where it cannot come in contact with passing carriers. This carrier-forwarder, as described, was invented to meet the want for a forwarder for way-stations along the wire which would not obstruct it for the passage of carriers from other points on the same wire, and I will first describe the detached forwarder or lever-foot B used for such a station, (so called because it is always detached from the track-wire.) The side bars, W W, Fig. 6, of this are of cast-brass, and are riveted to a walnut center piece, *p*, which is so beveled at the upper end as to allow the lever to be hinged to it by a pin-joint, and yet only allow the limited action of said hinge as a knuckle-joint, which is required in its use, as shown, and this is true of the other lever-foot forwarders later described.

Just below the walnut center piece a wide flaring pulley-wheel, Y, is pivoted between the bars, which is thus made so that in its descent it will always embrace the track-wire and guide it to its center groove, and then revolve upon it as it passes forward or backward through the action of the lever. Just before this pulley-wheel is a cross-pin, X, which serves as a guard to the wheel and a point of contact in moving the carrier forward upon the track. This is accomplished by placing the carrier upon the track-wire with its malleable guard end H toward and a little before the propeller. Then, by a down-pulling of the cord, the pin X will come against the guard H, and with the forward stroke of the lever the carrier will be caused to glide off in steady rapid motion to the cashier's station, to be returned in a few seconds upon the other wire, and detained by the use of the cord M alone, or

in connection with the wire hook N, as occasion may require. The lever, after the stroke, retiring, leaves the track free for other carriers.

My attached lever-foot or forwarder shown on the extreme right is so called because its rear part or wooden draw-slide Z is always attached movably to the track-wire, which passes centrally through it, as shown, allowing it by its attachments to slide back and forth upon the wire while doing forwarding service. The parts which connect it with the lever are similar to those of the detached foot, especially at the front end. The side bars, however, are longer, and most of their length are wider apart to accommodate the upper portion of the carrier between them in drawing it forward in progressive action. The draw-slide Z has a half-section of solid rubber ball attached to its front end, which serves as a bumper. The side bars are attached and hinged to the draw-slide Z by screws. This attached lever-foot is adapted to be used at end stations because of its long stroke, and as herewith represented is used at such a station to send carriers to the cashier's office. In some stores only a single wire is used in sending and returning cash or messages, and in such cases this attached foot would be used at both end stations, and with my swing-hinge (explained later) attached to the lower end of each lever it would serve as a complete detainer for the incoming carriers at such stations.

Figs. 7, 7ª, and 7ᵇ represent my pivoted post with attachments in combination as used in a cashier's office or elsewhere, as desired, by which one general forwarder serves to send out carriers in various directions over wires going out thence to other stations, and co-operating with parallel return-wires from all such connected points at one station, making the benefits of my invention more general and wide-reaching than when confined to a single line of stations as at first arranged.

M¹ is a wooden post fastened to the ceiling, and strongly braced, as shown, having firmly secured to its base or lower end an iron-bound wooden hub, N¹, which projects outwardly from it, forming an "attachment center," so called because forming a convenient and substantial basis for attaching wires that extend thence to other stations in various directions, and for attaching others that return carriers from such stations to this. (See Fig. 7ª.)

Connected with the first post, M¹, by pivotal bearings, and also with the floor below, is my pivotal post O¹, having horizontal bars P¹, braced, as shown, with an upwardly-inclined projection of the braces at D¹, which serves as a basis for supporting my general forwarder C¹ and its bearing-wires B¹ B¹, and also a pulley-wheel, Q¹, arranged in a mortised opening, and connected by cords c^3, attached to the ends of the forwarder, which pass reversely over the top and down around the pulley to a point of attachment, as shown. An outer and smaller pulley, R¹, is attached to the shaft of the first, having a cord, G¹, with a handle suspended from its front side, and so attached that when pulled downward a very short and easy motion will revolve this and the larger pulley sufficiently to draw forward the general forwarder to the extent of its length, the revolution of the wheel being limited by contact of a side projection or pin, X¹, with rubber bumpers A¹ A¹, located upon the upper and lower sides of the arm, as shown.

C¹ is my general forwarder, being a one-inch wooden bar, having short shouldering projections above and below at each end, with holes in same, through which the bearing-wires B¹ and B¹ are slipped, and on which it is movably suspended. Its upper projection, H¹, is covered with sheet-brass, which projects from its sides forwardly and outwardly, so that a car set upon the track-wire above can be moved back into it, and be held thus from rocking on the wire by contact of its rear corners with the inner sides of these projections; or, if the upward projection is made on a smaller scale, to grasp or receive the beveled head of the tongue X⁵, suspended as shown for the purpose, increased perfection of action may be attained, and hence when borne forward with the forwarder (by means explained) the carrier will glide on in its course steadily, readily, and as rapidly as may be desired, and what is true in this combination of one wire is as well also of all others suspended in line with this general forwarder, and thus above it.

Instead of a pulley, Q¹, and cord c^3 connecting the latter to the forwarder C¹, the pulley may be supplanted by a gear or toothed wheel, and the forwarder may have rack-teeth on the under side meshing therewith.

An elastic rubber cord or band, W¹, attached to the rear end of the forwarding-shaft and to the pivoted post-arm back of it, serves to draw the shaft back after forward action.

A graduating brake-lever, S¹, is attached to the post O¹, so that it can be pressed by the hand of the operator to bear on the periphery of the pulley-wheels to moderate their motion in connection with it, and in so doing the motion of any carrier that may be destined to a station comparatively near, thus regulating the action of the forwarder according to the distance to which a carrier is to be sent, the carrier being plainly marked 1 2 3, &c., according to the relative distance from the cashier's office of the stations to which they belong.

T¹ is a cast-iron locking-ring encircling the base of the pivoted post, where it is secured to the floor by screws. It has openings drilled in it to receive the tapered lower point of a locking-rod, U¹, which is guided perpendicularly through a bracket and an opening in the wooden brace above to the pivoted post, yet movably so that it can drop by its own weight into any opening in the locking-ring, thus locking the post so that the forwarder shall be directly under a particular wire for sending a

carrier out upon it. This locking-rod has a shouldering round projection, E^4, at a certain point upon it, against which bears a lifting or unlocking cam-headed lever, L^3, which is pivoted to the post, and serves to elevate the locking-rod so as to permit the post to be turned axially.

My terminal detainer, Fig. 8, has a hole in its upright part I^3, as shown, through which the track-wire is slipped before suspension. At its point of location short wires are soldered each side of the track-wire to it, so as to give a somewhat flat basis for two right-angled brass attachments, I^2 I^2, which are clamped by screw-bolts above and below it, so that their reverse angles can be screwed to the back of I^3, which is thus secured and held in upright position upon the suspended wire. A lower arm, K^3, projects forward from the base of I^3, its front end serving as a basis of attachment for a rubber band, L^3, which is stretched backward and upward, and fastened also to I^3 below the track-wire, forming an elastic detaining-bearing for the bottom of the carrier when it strikes it. An upper arm, M^3, projects forward from the top of I^3, having a slot or opening extending backward from the middle of its front end, which admits and allows to be there suspended by a pivot, p^2, the tongue end of the lever N^3, the lower back part of which is wedge-shaped in form, the thickest part being at its back end, the weight R^3 above serving to balance it. The outer end has a swing-gate, O^3, suspended from it by pivot-fastening, which will swing inward and upward into a mortised opening prepared for it when the car comes in under it, but falling behind it serves to arrest its return, as it will not swing but in the one way mentioned. A slight groove in the bottom of the lever serves to guide the car as it enters the detainer until its front bottom part touches and tightens upon the rubber band, and its top does the same in contact with the beveled part of the lever-tongue, which yields a little, causing the forward end of the lever to press down on the car as a brake, thus contributing to arrest its motion, and yet in a flexible way, so as to avoid the sudden shock of instantly-suspended motion, and by this means gives such equalization in pressure upon the points of contact as will avoid all strain upon the car. The rubber cords P^5 P^5, stretched in X form from the front ends of the upper and lower arms, serve to reduce the impetus of the car before its final detention.

In my experiments all manufactured insulated wires that I have found have been either too large, too loose, or too rough for advantageous use as track-wire, and I have so far found nothing better than thin rubber tubing cut straightly open lengthwise on one side, dressed on the inside with good coach-varnish, and then put upon the wire nicely and allowed to dry, as in Fig. 11. When painted, it gives a smooth yet soft padded surface to the track-wire, greatly promoting silence in its use above that of the bare wire.

Fig. 9 shows my detachable forwarder, and it is shown in Fig. 5 in smaller form suspended from cord M, in readiness for use in connection with it. It is made in the shape of a mallet with slot for the track-wire and supporting-pulleys, and in its adaptability to being put upon, moved upon, and taken from the track-wire readily has the essential features of my cash-car. Its pulleys, however, are quite small and do not project beyond its ends. It has a heavy metal handle, T^5, screwed into its base, which is convenient in handling it, and serves as ballast to keep it in perpendicular poise when in independent use upon the track-wire, for I have found that the most satisfactory stroke can be given with it by using an elastic cord, S^3, as shown, moving the forwarder from its rear end by the hand, being careful to give it only a horizontal motion, and retaining the end of the elastic cord between the fingers, to allow the forwarder to follow the car a little beyond the stroke of the hand, which gives uniform steadiness of motion to the car as it passes on before it. This is effected, as it could not be done by all persons directly by hand upon the car, in part by use of a contact-wire formed somewhat like a square staple, S^2, with a rubber tube-covering, which is fastened to the front end of the forwarder about one-eighth of an inch above the level of the track-wire, so that it can come in contact with the guard H upon the car for its impulsion. As for the perfect steadiness of the car, it must be moved from a point close to the track-wire, which by this forwarder is thus accomplished. Another method of using this forwarder, which by some will be preferred, (as not requiring them to reach so high,) is to have the elastic cord some longer and the other end attached to the front of the car. In such cases the cord would be grasped in doubled form near its middle or lowest point, and the forwarder, by motion of the hand, would be moved back and forth upon the track, as required, a little play being allowed by raising the hand in the forward action to maintain more perfect horizontal motion.

I found that in suspending wires tightly for this purpose provision must be made for side bracing, as well as the more direct in the line of the strain, and that sound conveyed through the braces and attachments might annoy those upon the floor with which these braces were connected, and I have hence been led to use flaring braces B *r*, (see Fig. 10,) extending from the wire to the ceiling and preventing side motion in any way, and rubber cushions or washers *w* between the braces and the ceiling or floor, to prevent or diminish the conveyance of sound through them. I also use the rubber cushions as washers in fastening the track-wires for the same general purpose.

My improved lever-stroke forwarder for terminal stations is preferable to that described

and shown in my previous application, in that the present form is more simple, less liable to friction and disorder, much less expensive in construction, being considerably of cast-iron, and much easier in its working, (as this lever makes a horizontal stroke, while the other with a weighted end made an upward stroke.) With this the line simply turns one large pulley partially, while in the other some lines were drawn at disadvantage under small pulleys. This method does not involve the jar that the weighted lever made when suddenly stopped, and its automatic return action is preferable to that of the dangling weight.

My detached forwarder for distant intermediate stations meets a want, as nothing of the kind was before provided, and while complete as a forwarder it is admirable in its return action, leaving the track at once entirely unobstructed.

In my car or carrier the skeleton guard is an improvement, as it makes available the benefits of my improved lever-stroke forwarder. The truck-plate gives perfection in the action of the pulleys and strength to a weak part of the carrier. The wire-and-cylinder method of opening and closing the sections of the cash-carrier, being more smooth and easy in action and more enduringly serviceable than the tongue-and-groove method, is hence preferable. The spring for preventing derailment of the car is very convenient in action, and where there is any liability of a carrier coming in contact with suspended goods or passing objects its use will be appreciated. The suspended line as used alone and in combination with the wire hook attached to the track-wire form flexible and prompt detainers for intermediate stations, much preferable to any before used for the purpose.

My attachable and detachable forwarder has the same advantages of my cash-carrier, in that it can be instantly put upon the track-wire for use and as readily taken from it, and for near intermediate stations or any near stations it has all the advantages of more obstructive machinery without its expensiveness.

The advantages of my pivoted post and connected forwarding machinery have been given quite fully in their description. They form a combination simple rather than complex, easy of action, and thoroughly effective in forwarding a cash-carrier upon a single wire, or in succession upon any of a series of track-wires diverging thence, the change from one to the other being effected almost instantly, thus widening and extending the benefits of this rapid and convenient method of light conveyance more widely than when confined to a single line of connected stations as at first.

My improved terminal detainer has the advantage of stopping the carriage by gradual, yet flexible, pressure, first upon its forward end, and then from below and above upon it in its reception, thus avoiding the shock and the rebound attending the use of my former general detainer, and now by my drop-swing gate, making the detention of the car at the desired point always a certainty. The thin smooth padding or cover that I attach to the wire track shows manifest advantage in the promotion of silence in the passage of cash-carriers upon it.

The attachment basis for outer end stations will be found quite satisfactory, for with the wires drawn as tightly as is required the attachment basis must be strong. This gives the strength and the necessary width for attaching both wires. The rubber cushions used in connection serve an excellent purpose in effecting silence.

Having thus described my invention, what I claim as new is—

1. In combination with the parts A and B of the carrier, two wires, *a a*, with a cylinder, *b*, upon each of them, as shown, the brackets C^2, D^2, and F^2, forming an improved means for slipping the two sections B and A apart and together when in use, substantially as shown and described.

2. The truck-plate G, in combination with sections B and C and the pulleys O of my carrier, substantially as shown, and for the purposes mentioned.

3. The pulley-guard H, in combination with sections B and C and pulley O of the carrier, substantially as set forth.

4. The brass-wire lever J, with the spring K and the bridge L, in combination with section B and the track-wire, to prevent derailment of the car when in motion upon it, substantially as described and shown.

5. The pulley-wheel P, having one side more heavy than the other to produce return action of the forwarder and connected parts after action, in combination with the lever S, the forwarder, the cord, track-wire with the car upon it, and the frame-casting O, with connected parts, as set forth.

6. The frame-casting O as a supporting basis for a pin supporting the pulley-wheel P, and the lever S, in combination with them and other connected parts described and used in forwarding a cash-car upon a suspended wire or track, substantially as described, and for the purposes mentioned.

7. A lever suspended at its upper end above a horizontal track or wire, and combined with the same, and a forwarder upon the track for propelling a cash-carrier to an advanced station beyond, substantially for the purposes stated and shown.

8. The attached forwarder, embracing the draw-slide Z, the side bars, W W, and the center piece, X, as attached together and to the wire, in combination with the lever S, the pulley-wheel P, the frame-casting O, the cord and connected parts as used and described, to forward a car upon the track-wire from one terminal station to another, as set forth.

9. The detached forwarder disconnected from the track-wire, embracing the pulley Y,

side bars, W W, the center piece, *p*, the cross-pin X as attached together, and in combination with the lever S, the pulley-wheel, the frame-casting O, the cord and connected parts as used and described, to forward a car upon the track-wire from a distant intermediate station to a terminal one, leaving the track unobstructed after action, as described.

10. An oblong mallet-shaped detachable forwarder for hand use, having two supporting-pulleys incorporated therein, with a slot extending in lateral direction upwardly and inwardly to the bottoms of the pulleys throughout the whole length of the forwarder, having a rubber-covered contact-wire, S^2, a heavy handle, and an elastic cord attached, as set forth.

11. The mallet-shaped detachable forwarder having upwardly-extending slot, supporting-pulleys, and pendent handle, substantially as shown and described.

12. The post M^4, strongly braced, as shown, and connected at its base with the attachment-center N^4, in combination also with attached radiating track-wires, the pivoted post O^4, and means for propelling the carriers, as described and used, substantially as set forth.

13. The pivoted post O^4, having pivoted bearings at both its ends, projecting arms P^4 P^4, the pulley-wheels Q^4 and R^4, the brake-lever S, the sliding forwarder C^4, with attached cords C^3 passing around the pulleys, the wire-bearings B^4 B^4, the cord G^4, and the elastic spring W^4, all combined as shown and described.

14. The combination, with the swiveling post O^4, of the ratchet-ring T^4, the locking-rod U^4, the lifting-lever L^3, the center attachment N^4, the stationary post M^4, the radiating series of suspended track-wires with cars supported on them, and means for sending such cars from a cashier's office over a series of wires in different directions by the use of one forwarding combination, and of receiving the return-carriers there in one place from so many different sources, as set forth.

15. The combination, with a series of radiating track-wires, of a swiveling post turning about the vertical center of the same, and propelling devices for forwarding carriers on said wires, which means are made adjustable with the post, as shown and described.

16. The locking-rod U^4, attached perpendicularly yet movably to the pivoted post O^4, in combination with it, the ratchet-ring T^4, the unlocking-lever L^3, and collar E^4, to fasten the pivoted post, substantially as set forth.

17. The pulley-wheel Q^4, having a lateral pin projection, and cords c^3, attached and passing up and reversely over it, connecting it with opposite ends of the general forwarder C^4, in combination with post O^4, arms P^4, wires B^4, and means for locking the post in position, substantially as set forth.

18. The forwarder C^4, having at its rear end an upward projection, H^4, adapted to grasp the carrier and steady it, in combination with the supporting guide-wires and means for actuating said forwarder, as described.

19. The pulley-wheel R^4, having connection by its shaft with Q^4, in combination with the same, and the cord G^4, attached as shown, and the forwarder C^4, as and for the purpose described.

20. The attachment-center N^4, strongly braced to form a basis of attachment for diverging suspended wires, in combination with them, the pivoted post O^4, and the connected and co-operating parts of this forwarding machinery, as set forth.

21. The brake-lever S^4, attached by pivot to post O^4, so as to have a frictional bearing on the pulley Q^4, in combination with said pulley, the pulley R^4, and the line X G, to limit or graduate the force of the forwarding motion by light or heavier brake-pressure upon the pulley and connected machinery, as shown and described.

22. The terminal detainer embracing the upright part, I^3, connected to the wire, the front lower arm, K^3, the elastic band L^3, the upper arm, M^3, and the pivoted lever N^3, having swing-gate O^3, as set forth.

23. The elastic crossed cords P^5 P^5, in combination with the detainer I^3 K^3 L^3 M^3 N^3, as and for the purpose described.

24. The suspended line M, with elastic rubber tubing attached, combined with the carrier-wire to detain carriers upon it at intermediate stations.

25. The hook N, in combination with the track-wire, and the suspended line M, with elastic rubber tubing upon it to detain carriers upon the same, as set forth.

26. A hanger attachment for track-wires, having flaring braces, in combination with rubber cushions interposed between them, and a ceiling or floor to which they may be attached, as set forth.

27. The combination, with the track-wire and the supports B *r*, connecting the track-wire to the ceiling, of elastic cushions *w*, interposed between the track-wire supports and the ceiling-timbers to prevent the transmission of vibration and noise, as set forth.

28. A line having a handle attached suspended upon one side of the center of a pulley-wheel, so as to partially revolve it when pulled downwardly, in combination with said pulley, arranged in an immovable frame, and connected machinery described, to forward a carrier upon a track-wire, as set forth.

29. A forwarder movably connected with a horizontal bearing, and with a wheel or pulley, and combined with the same, as described, whereby the turning of the wheel partially one way will give the forwarder horizontal motion such as will move forward a cash-carrier supported on pulleys on a horizontal track or wire from one station to another upon it, and turning the wheel the reverse way will

bring back the forwarder to its former position in readiness for renewed action, as set forth.

30. The cash-carrier having a groove in its bottom, in combination with a tongue, X^5, pivoted therein, and having a beveled head or latch, as and for the purpose described.

31. Wires or tracks suspended from a common center piece, and extending in direct line thence to stations in various directions, whereby the carriers may be moved upon them by direct motion from the common center in line with said wires to the outer stations, in combination with parallel wires for the return of carriers upon them, as described.

GEORGE H. SPRING.

Witnesses:
JOHN MAYHER,
GEORGE H. HEWES.