(No Model.) 2 Sheets—Sheet 1.

L. BOUDREAU.

STORE SERVICE SYSTEM.

No. 303,800. Patented Aug. 19, 1884.

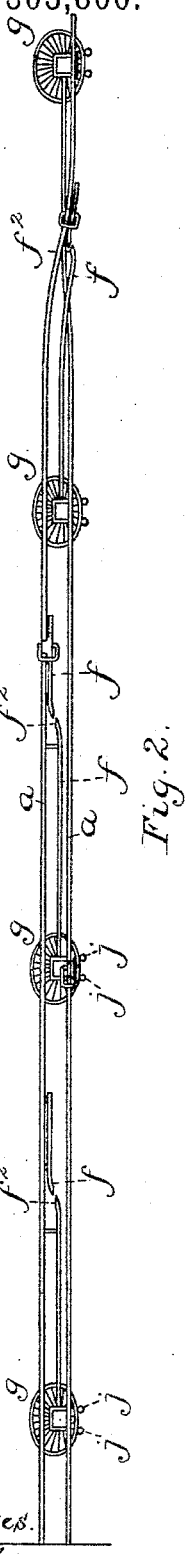

Fig. 2.

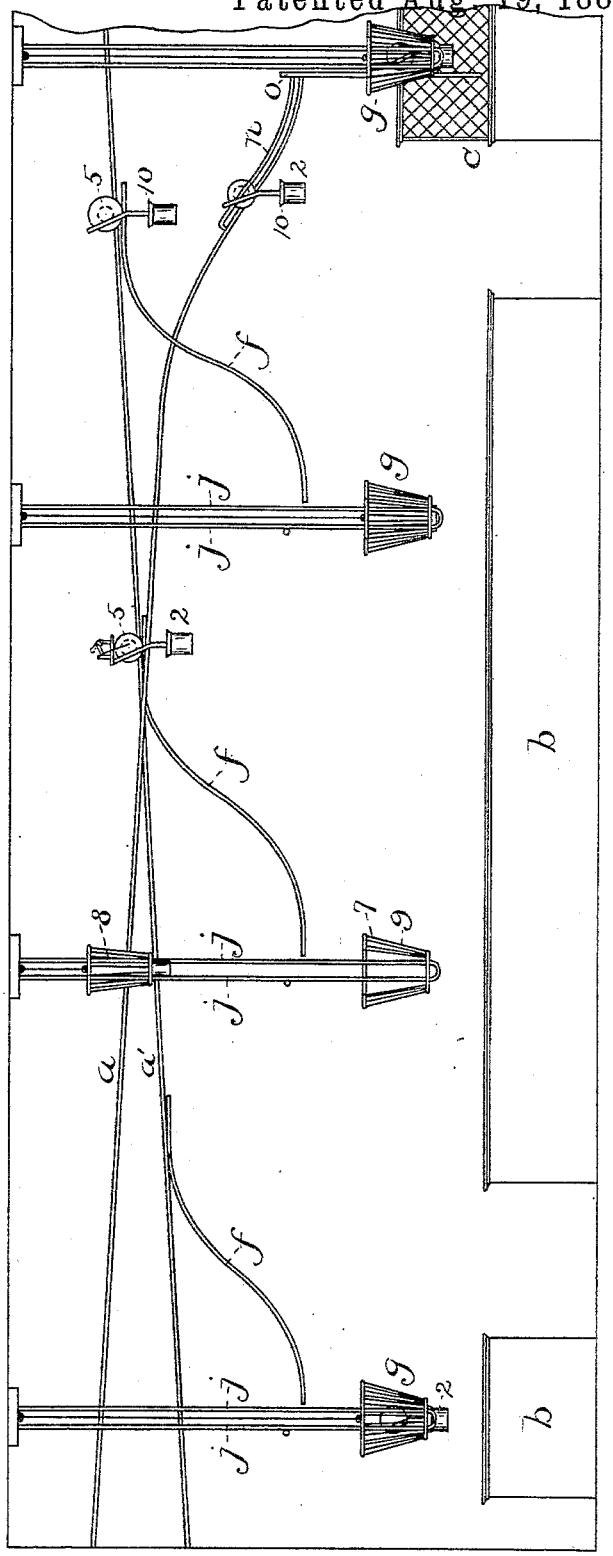

Fig. 1.

Witnesses.
H. Brown
A. C. W. Litle

Inventor. L. Boudreau. by Wright Brown & Quinby Attys.

(No Model.) 2 Sheets—Sheet 2.

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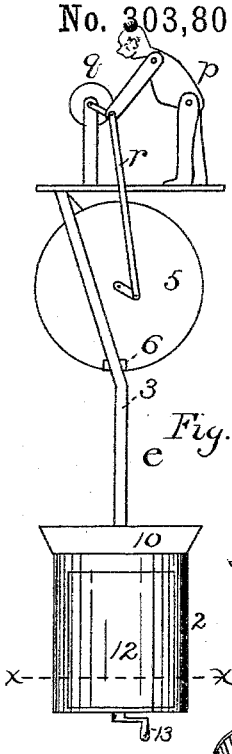


Fig. 3.

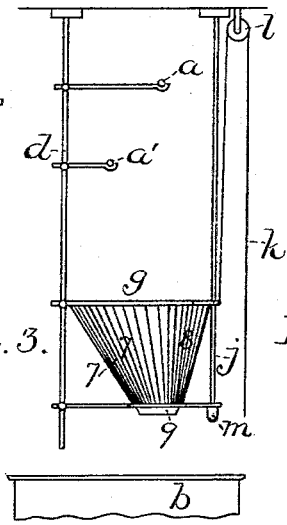
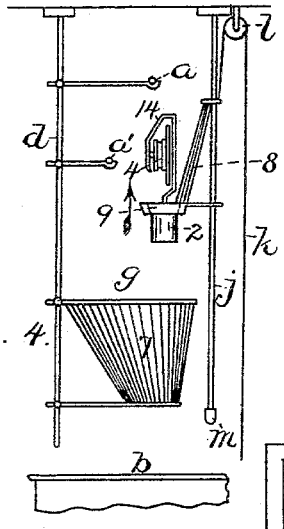


Fig. 4.



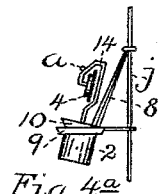


Fig. 4a.

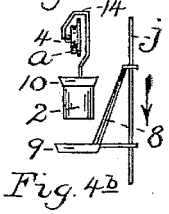


Fig. 4b.

Fig. 11.

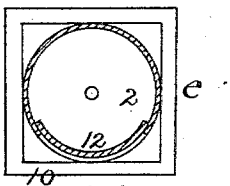


Fig. 12.

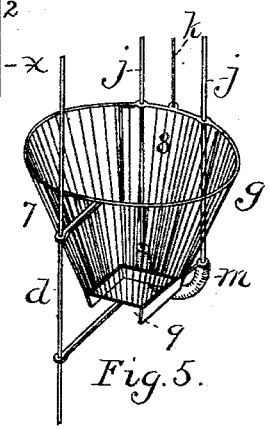


Fig. 5.

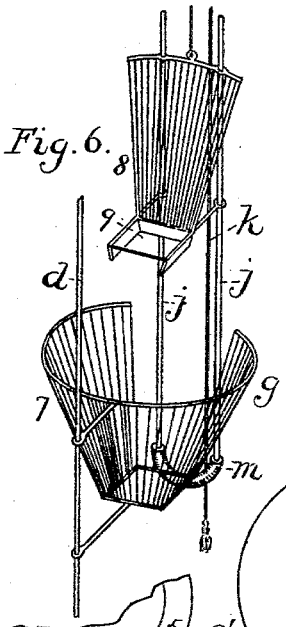


Fig. 6.

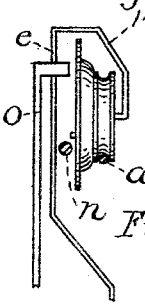


Fig. 10.

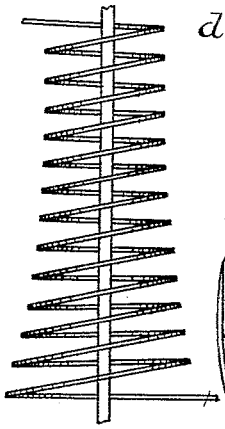


Fig. 13.

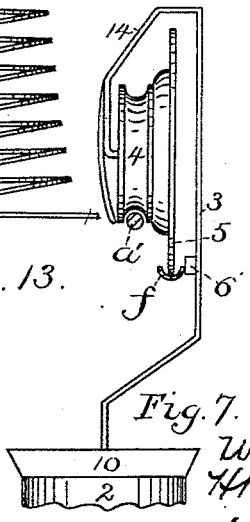


Fig. 7.

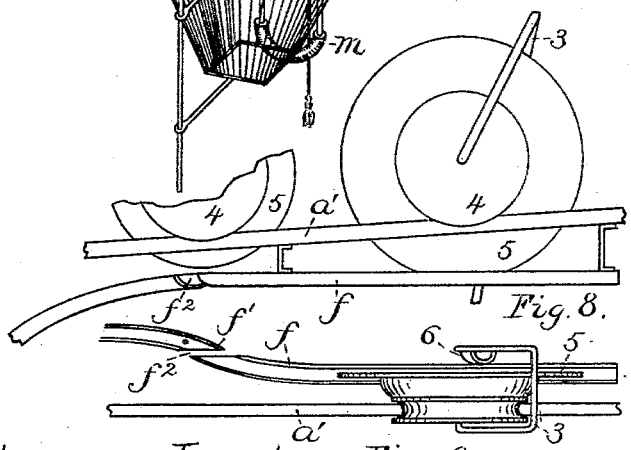


Fig. 8.

Fig. 9.

Witnesses.
H Brown
A L White

Inventor.
L. Boudreau
by Wright & Brown
Attys.

UNITED STATES PATENT OFFICE.

LÉANDRE BOUDREAU, OF MANCHESTER, NEW HAMPSHIRE.

STORE-SERVICE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 303,800, dated August 19, 1884.

Application filed April 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, LÉANDRE BOUDREAU, of Manchester, in the county of Hillsborough and State of New Hampshire, have invented certain Improvements in Store-Service Systems, of which the following is a specification.

This invention relates to that class of cash-carrying or store-service systems comprising inclined ways or tracks extending in pairs between the counters or stations and the cashier's desk of a store, and carriers adapted to run thereon, one track having a downward inclination from the counters to the desk, and the other track a reverse inclination, so that the carriers will run from the counters to the desk, and vice versa, means being provided whereby each carrier, on its way from the desk, is caused to leave the track and descend to the counter at the station from which it was sent, and no other station, while each station is provided with means for elevating a carrier to the track leading to the desk.

Heretofore in this class of store-service systems the track has been formed to support hollow balls of different sizes, which constitute the carriers, and has been provided with pivoted traps or sections at the different stations, each trap being adapted to yield only to a ball of a given size, as in the so-called "Lamson" system. This form of track is necessarily expensive, having to be made very accurately and of costly materials. In other and less expensive store-service systems continuous tracks are employed, consisting of rods or wires stretched between suitable supports and adapted to support and guide a grooved pulley on a carrier; but in such systems no provision has been made heretofore for dropping each carrier automatically from the track at the station for which it is intended, and for elevating it from the station to the track extending to the desk; hence the capabilities of the wire-track system have not been so great as those of the Lamson system.

My invention has for its object to provide a store-service system having continuous tracks of wire or equivalent material, arranged in pairs, extending at opposite inclinations, carriers having wheels adapted to run on said tracks, appliances for automatically removing each carrier from the track when it reaches a point over its own station, and allowing it to drop at said station, and appliances for elevating the carriers from their respective stations and placing their wheels on the track leading to the cashier's desk.

The invention also has for its object to provide an improved wire track adapted to conduct a carrier from a given point to another vertically below.

To these ends my invention consists in the several improvements, which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents an elevation showing my improved system applied to a store. Fig. 2 represents a top view of the same. Fig. 3 represents a side elevation of the appliances at one of the systems, the track being shown in cross-section. Fig. 4 represents a similar elevation showing the manner of elevating a carrier from the station to the track leading to the desk. Fig. 5 represents a perspective view of the combined receptacle and elevator which receives the carrier when it falls from the track. Fig. 6 represents a similar view showing the elevator partly raised. Fig. 7 represents a transverse section of the track from the desk to the counter, showing a carrier about leaving the track preparatory to falling to the station for which it is intended. Fig. 8 represents a side view of a part of the track, showing the carrier-wheel in the same condition as in Fig. 7. Fig. 9 represents a top view of the parts shown in Fig. 8. Fig. 10 represents a transverse section of the track from the counter to the desk, showing an appliance for arresting each carrier as it approaches the desk, and a guard which prevents the carriers from being displaced from the track. Fig. 11 represents a side elevation of the carrier, showing a toy figure operated by the rotation of the wheel. Fig. 12 represents a section on line $x\,x$, Fig. 11. Fig. 13 represents a spiral track adapted to guide a carrier from a given point to another vertically below.

The same letters of reference indicate the same parts in all the figures.

In the drawings, a and a' represent two inclined tracks, each preferably composed of a single wire or otherwise formed to present a continuous or uninterrupted surface and support a grooved wheel. The track a is inclined

downwardly from the counter or counters *b* to the desk *c*, and the track *a'* is inclined downwardly from the desk to the counter. The tracks are supported by brackets or hangers *d*, secured to the ceiling or elsewhere, as may be found convenient.

e represents one of the carriers which I employ with my improved system. Said carrier is composed of a receptacle, 2, preferably of cylindrical form, a bent arm or rod, 3, secured to the upper end of the receptacle, and a grooved pulley, 4, journaled on a bearing formed at one end of said rod. The pulley is adapted to run on either track, and the receptacle depends from the pulley below the track, as shown. The pulley is provided with a flange, 5, at one side of its grooved tread. The flange 5 of each carrier has a different diameter from the flanges of all the other carriers in the series.

Under the track *a'*, leading from the desk to the counter or counters, are a series of switches, *f*, which are placed at different distances from the track, the one nearest the desk being separated from the track by a wider space than the next, and so on, the space decreasing at each successive switch. The first switch is placed at such a distance from the track that it will come in contact with the largest flange 5 when the carrier having said flange reaches said switch, and will raise the wheel of said carrier from the track *a'*, as shown in Figs. 7 and 8, the carrier being then entirely supported by the switch. The switch is grooved on its upper surface, as shown in Fig. 7, and is curved as shown at *f'*, Fig. 8, so that it will guide the carrier-wheel laterally away from the track *a'*, and is then curved downwardly, so that it will conduct the carrier downwardly at one side of the track to a basket, *g*, located at the lower end of the switch, the carrier dropping into the basket, as hereinafter described. The next switch is arranged to raise the flange 5 next in size, said flange passing over the first switch without touching it, and so on, each flange 5 being acted on only by its particular switch, there being as many switches as there are carriers.

To enable the carriers to pass by the switch or switches not intended to displace them, I cut a passage, f^2, through each switch in its curved portion *f'*. The rod 3 of each carrier, designed to pass by the switch, passes through said passage without striking the switch.

To prevent any flange 5 from passing through the passage f^2 in the switch on which it runs after leaving the track, I provide the rod 3 of the carrier to which the flange pertains with a protuberance, 6, which is arranged to bear against one edge of the switch, as shown in Fig. 8, and cause the carrier to follow the lateral curvature of the switch. In each carrier the protuberance 6 is so arranged that its lower edge is flush with the lowest point in the periphery of the flange 5, so that said protuberance will bear only against the switch, which acts on the carrier to which it pertains.

It will be seen from the foregoing that each carrier, as it is placed by the cashier on the higher end of the track *a'*, will travel along the track until it reaches the switch intended for it, and will then be raised from the track, moved sidewise, and guided to its basket by said switch. The carrier having the largest flange will be acted on by the first switch, while the carrier having the smallest flange will be acted on by the last switch. Each basket *g* is composed of a fixed section, 7, and a vertically-movable section or elevator, 8. These parts, when the movable section is depressed, as shown in Fig. 5, constitute a basket, which is elliptical in cross-section at its top, its sides converging to a rectangular frame or opening, 9, at the bottom of the basket, said frame being secured to the movable section or elevator 8. Each carrier is provided with a rectangular portion, 10, at its upper end, adapted to fit and rest upon the inner sides of the rectangular frame 10.

I prefer to make three of the sides of the frame 9 of flat plates of considerable width—say an inch or more—while the fourth side is made of a single rod or wire, as shown in Fig. 6. The flat sides are beveled inwardly, and the sides of the rectangular portion of the carrier are correspondingly beveled; hence the frame 9 constitutes a seat or support on which the rectangular portion of the carrier rests when it drops into the basket. The described form of the basket and of the frame 9 causes the carrier to always assume a given position when at rest in the basket, so that when raised, as hereinafter described, by the elevator it will be sure to be in position to engage with the track. When the carrier is in place in the basket, its cylindrical receptacle projects below the bottom of the basket, said projecting portion having a door or slide, 12, adapted to be opened by the attendant by turning a handle, 13, or otherwise. Access can thus be had to the interior of the receptacle without removing the carrier from the basket. The elevator has ears or guides adapted to slide on parallel vertical guide-rods *j j*, and is provided with an elevating-cord, *k*, passing upwardly over a pulley, *l*, and downwardly within reach of the operator.

When a carrier is to be raised by a salesman to the track *a*, a pull on the cord *k* raises the elevator, which is so arranged with reference to the track *a* that as the carrier rises an inclined portion, 14, formed on the rod 3 strikes the track *a* and causes the carrier to tip sidewise, as shown in Fig. 4ª, the body of the carrier projecting outwardly under the wire which forms one side of the frame 9 until the wheel 4 of the carrier passes above the track *a*, when the carrier tips back to a vertical position by gravitation, and thus moves its wheel over the track *a*, as shown in Fig. 4ᵇ, so that as soon as the elevator falls and leaves the carrier the wheel is supported by said track and the carrier commences to travel toward the desk. The elevator falls back to the fixed sec-

tion of the basket, a rubber buffer, *m*, at the lower ends of the rods *j j* relieving the jar attending its stop when it reaches the basket. The baskets may be supported by the same brackets or hangers that support the tracks, as shown in Figs. 3 and 4.

It will be observed that the track *a*, leading from the counter to the desk, is not provided with switches, the carriers placed on said track at any point running directly to the desk. The desk may be located on the same floor-level as the counters, thus obviating the necessity of placing the cashier in the heated and impure air at the top of the store. In this case it may be necessary to give the track a downward curve as it approaches the desk, as shown in Fig. 1. To prevent the carrier-wheels from jumping sidewise from the track on this curved portion, particularly when two or more accumulate at said portion, I provide a guard-rail, *n*, above the track and arranged to stand between the flanges and arms of the carriers. (See Figs. 1 and 10.)

o represents a movable stop at the end of the track *a* to arrest the carriers, so that they will not enter the basket at the desk until the operator moves the stop *o*. The cashier is thus enabled to admit the carriers singly and prevent any carrier from entering the basket at the desk when said basket is occupied by another carrier. The stop *o* is composed of a spring-lever adapted to bear against and arrest the arm 3 of a carrier, (see Fig. 10,) and to be moved back to allow the carrier to pass.

In Fig. 11 I have shown a toy figure, *p*, supported by the rod of the carrier and having a connection by means of a crank, *q*, and a pitman, *r*, with the wheel of the carrier. The figure is moved by the rotation of the wheel and gives the carrier a novel and pleasing effect.

Fig. 13 shows a spiral-wire track adapted to conduct a car between two points, one vertically above the other, as from one story of a building to a lower story. This form affords a gradual incline of considerable length in a small space. The lower coil or coils of the spiral may be enlarged, and the lower coil may be extended horizontally to enable the carrier to lose a portion of its momentum before stopping.

The spiral track may be supported by an upright extended through it and provided with suitable arms secured to a sufficient number of the convolutions of the track.

I am aware that the following features in a store-service system have been before used in combination, viz: main, side, and branch tracks, a carrier provided between the track-rails with a main flange and a branch flange of less diameter than the main flange, a stationary main-track-diverting flange placed at such elevation as to be reached only by the larger or main carrier-flange, and a side-track-diverting flange for shunting the carrier from the side to the branch track. I do not therefore claim, broadly, the provision of flanges of different diameters on the carriers and fixed automatic shunting devices to engage with said flanges.

I claim—

1. In a store-service system, the combination of continuous reversely-inclined tracks adapted to support carrier-wheels, and extending, as described, between the desk and counters, switch-rails arranged at different distances from the track leading from the desk to the counters, and each adapted to raise a given carrier-wheel from the track and conduct it first laterally and then downwardly, receptacles located at the lower ends of the switch-rails and adapted to receive the carriers from the switch-rails, and elevators forming parts of said receptacles, adapted to elevate said carriers to the track leading to the desk, as set forth.

2. The improved store-service system, composed of the continuous inclined tracks extending, as described, between the desk and counters, a series of carriers having flanged and grooved wheels adapted to run on said tracks, the flanges of the different carriers being of different sizes, independent switch-rails located at different distances from the track leading from the desk, each adapted to raise a carrier-wheel having a flange of a given size from said track and conduct it laterally and downwardly, receptacles adapted to receive the carriers from the switch-rails, and elevators forming parts of said receptacles, adapted to raise the carriers to the track leading to the desk, as set forth.

3. The combination, with the inclined continuous track leading from the desk to the counter, of switch-rails, each arranged to receive the flange of a carrier-wheel, and provided with an opening, *f*², adapted to permit the unobstructed passage of a carrier having a smaller flange than that for which said switch-rail is arranged, as set forth.

4. The combination, with the inclined continuous track *a'*, leading from the desk to the counter, of switch-rails, each arranged as described, a carrier having a grooved wheel, 4, a flange, 5, on said wheel adapted to be raised and guided from the track by said switch-rail, and a protuberance, 6, on the rod suspending the carrier from the wheel, said protuberance being flush with the lowest point of the flange and adapted to bear against the side of the switch-rail that removes the flanges from the track *a'*, and thereby cause the wheel to follow the lateral curvature of the switch-rail, as set forth.

5. The combination of the inclined tracks *a a'*, the switch-rails, the carriers having wheels adapted to run on the tracks and to be guided therefrom by the switch-rails, and also having angular shoulders or portions at their upper ends, and inclined portions 14 above their wheels, the baskets or receptacles arranged to receive said carriers and hold them in a given position, as described, each receptacle being composed of a fixed section and a vertically-movable section or elevator adapted to hold a

carrier, and devices composing the means for raising said elevator, and thereby causing the carrier to be inclined by contact with the track *a* in rising, and to move its wheel over said track in regaining its normal position, as set forth.

6. The combination of the fixed basket-section and the movable section having an angular frame at its lower portion, said sections forming, collectively, an elliptical basket having sides converging to said angular frame, and adapted to guide a carrier into the frame, as set forth.

7. The combination of the track *a*, the fixed basket-section, the movable basket-section having an angular frame at its lower portion, a carrier having an angular portion adapted to fit said angular frame, a grooved wheel, and an incline, 14, over said wheel, and devices composing the means for raising the movable basket-section, and thereby causing it to place the carrier-wheel on the track *a*, as set forth.

8. The carrier composed of the body 2, having a door or slide, 12, the angular portion above said body, the bent arm or rod, and the flanged wheel journaled on said rod, as set forth.

9. The combination, with the abruptly-inclined track *a*, leading to the desk, of the guard-rail *n*, arranged above and at one side of said track, and adapted to prevent lateral displacement of the carrier-wheels, as set forth.

10. The combination, with the fixed downwardly-inclined track *a*, leading to the desk, of the movable stop *o*, adapted to stand beside said track and arrest the carriers traveling downwardly thereon, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 1st day of April, 1884.

LÉANDRE BOUDREAU.

Witnesses:
C. F. BROWN,
A. L. WHITE.