(No Model.) 5 Sheets—Sheet 1.

C. W. McCORMICK.

STORE SERVICE APPARATUS.

No. 455,903. Patented July 14, 1891.

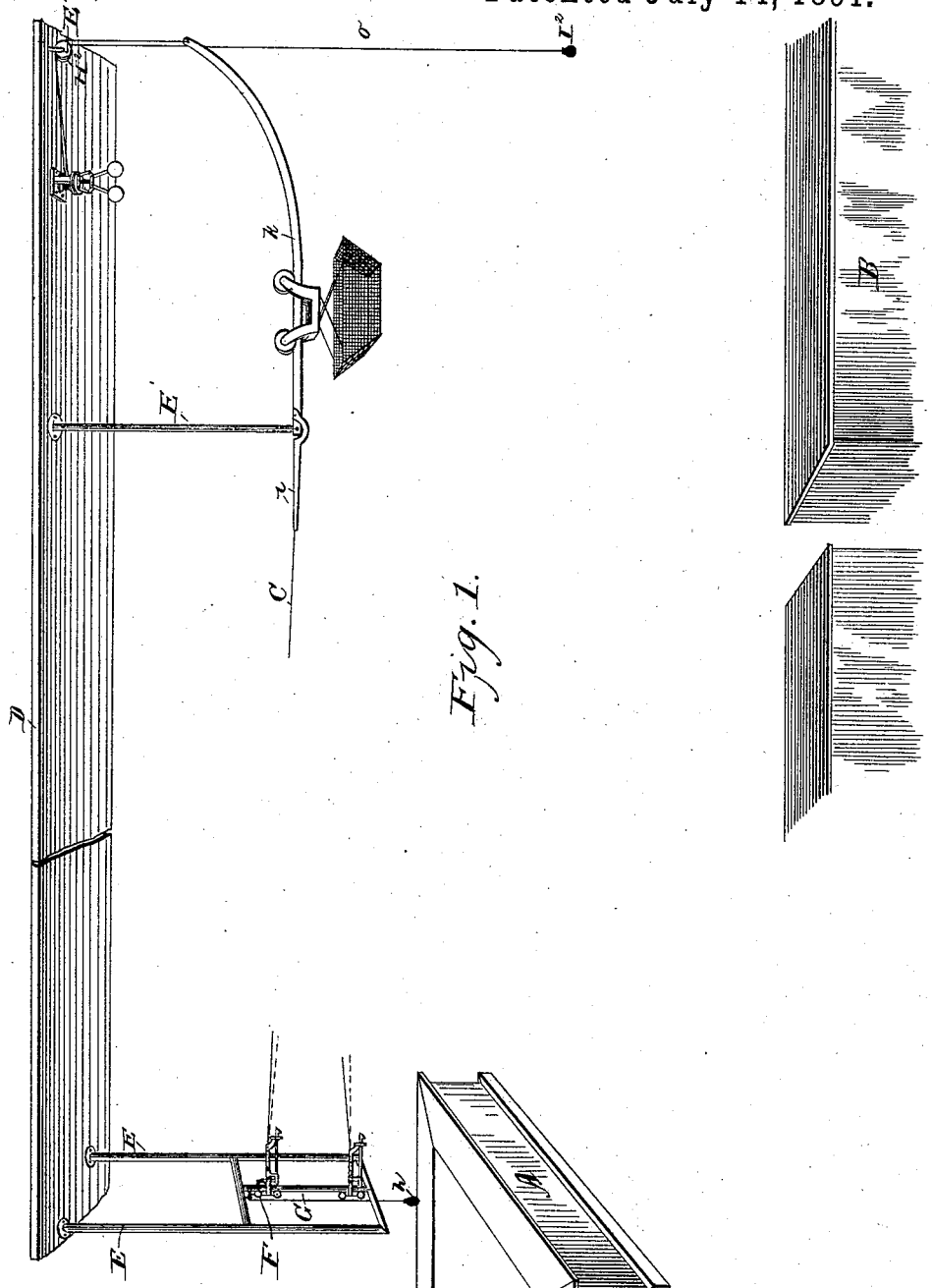

Fig. 1.

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STORE SERVICE APPARATUS.

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Fig. 2.

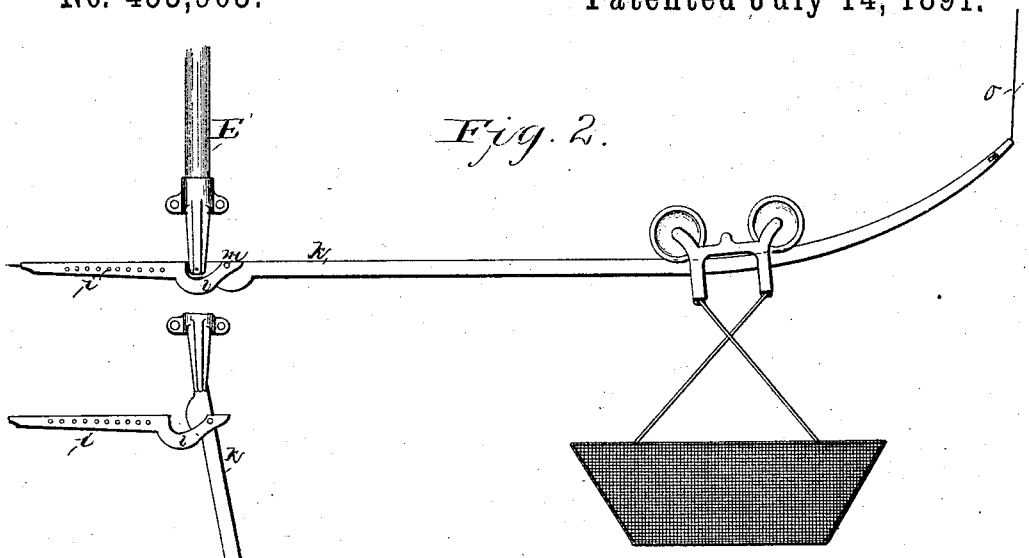
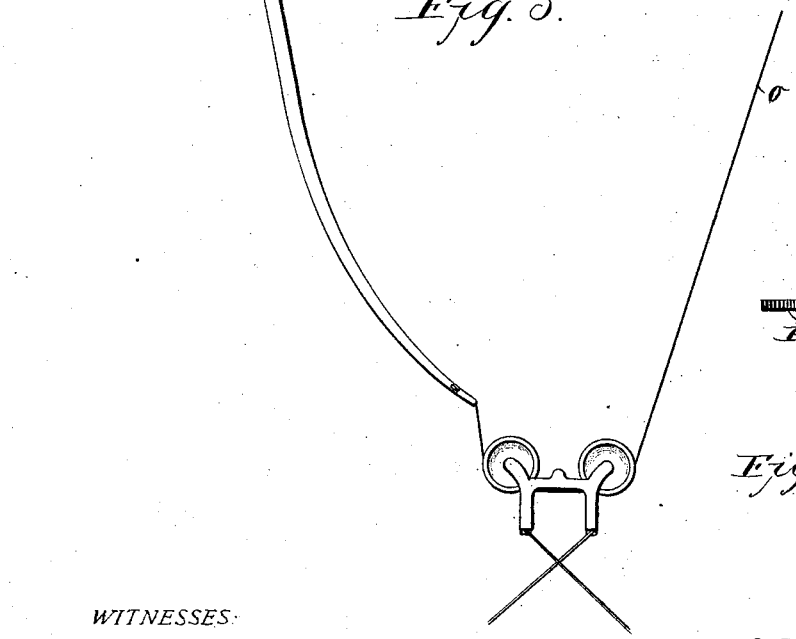


Fig. 3.



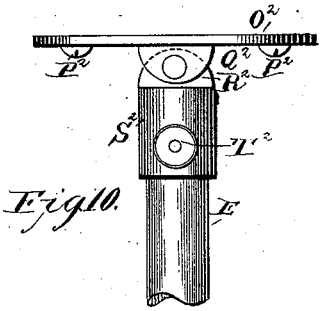


Fig 10.

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STORE SERVICE APPARATUS.

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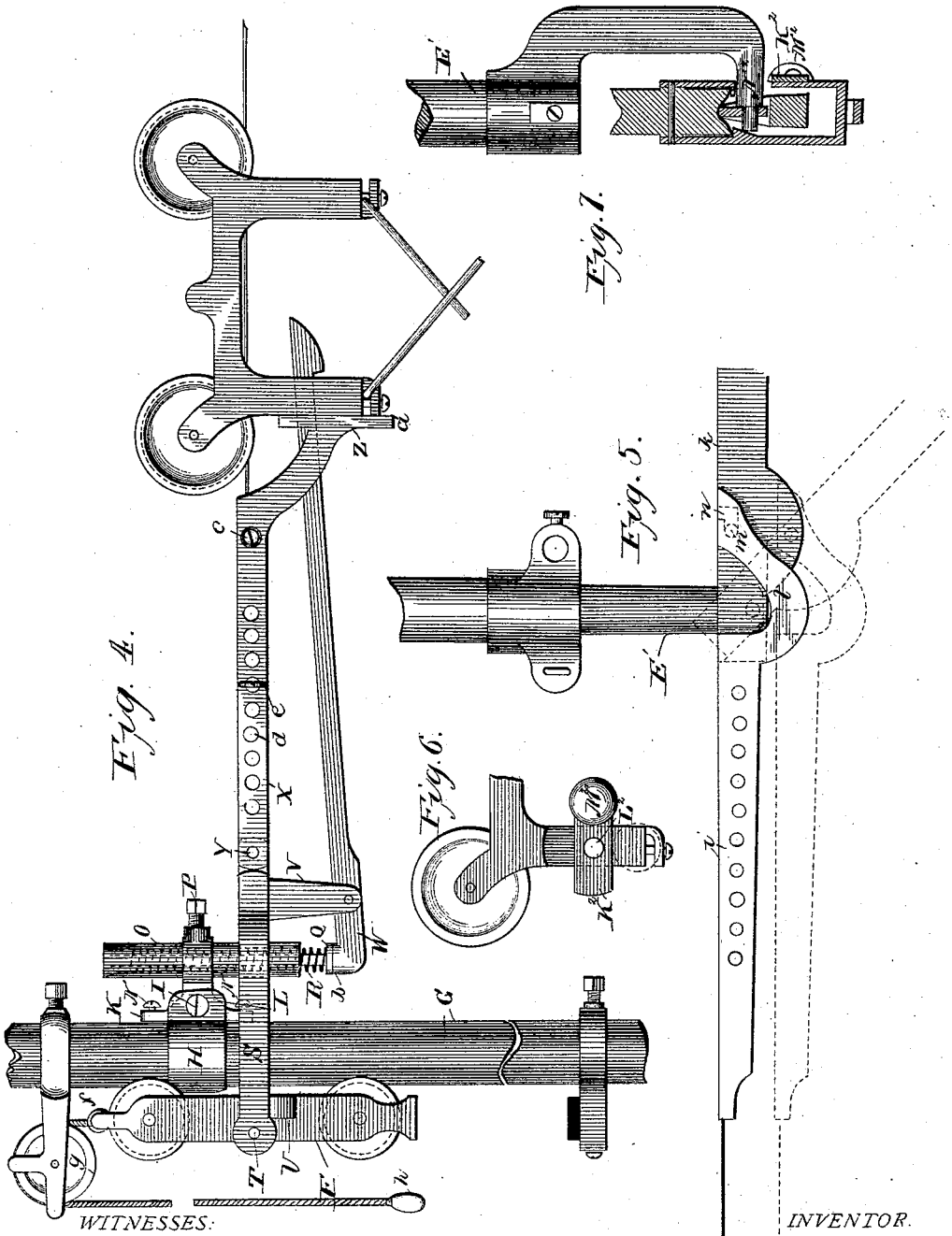

Fig. 7.

Fig. 5.

Fig. 4.

Fig. 6.

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STORE SERVICE APPARATUS.

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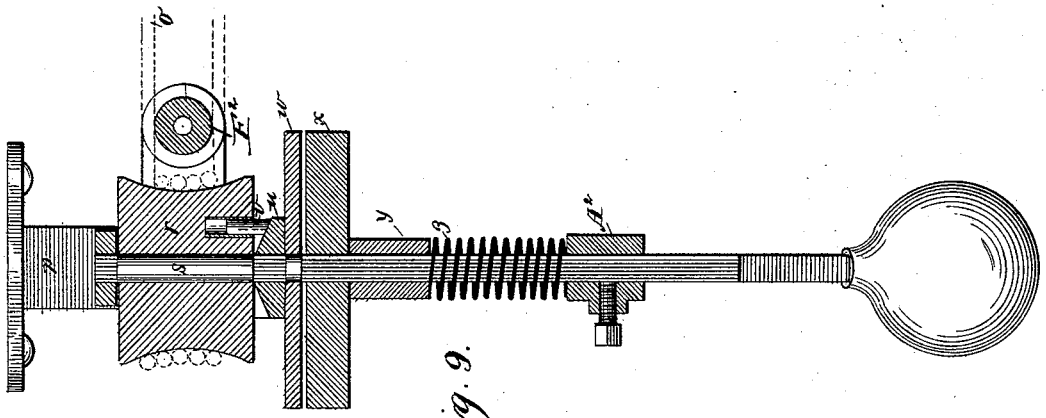

Fig. 9.

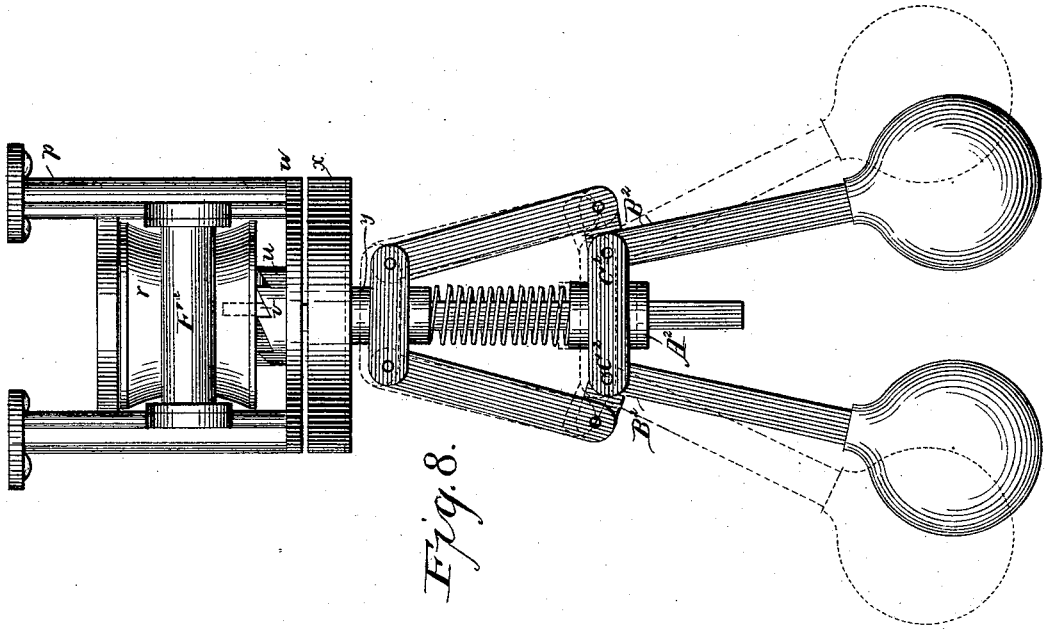

Fig. 8.

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STORE SERVICE APPARATUS.

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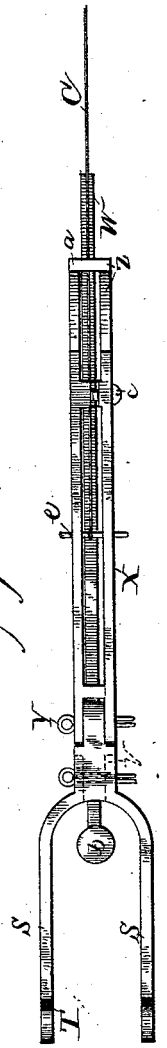

Fig. 11.

Fig. 12.

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UNITED STATES PATENT OFFICE.

CHARLES W. McCORMICK, OF EMPORIA, KANSAS.

STORE-SERVICE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 455,903, dated July 14, 1891.

Application filed September 23, 1890. Serial No. 365,885. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. McCORMICK, of Emporia, in the county of Lyon and State of Kansas, have invented certain new and useful Improvements in Store-Service Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

My improvements relate to that class of store-service apparatus in which a wire track is suspended at each end to support a car which traverses the track back and forth by force of gravity. In this class of store-service apparatus it is usual to provide for raising and lowering one or both ends of the track.

The object of my invention is to provide a track movable up and down, principally at one end, and having at the opposite end mechanism for delivering the car below what I will call the "fixed end" of the track, although it has a slight vertical movement, and in the operation of so delivering the car to automatically release and lower the movable end of the track.

In the accompanying drawings, Figure 1 is a perspective diagrammatical view giving a general idea of the position of the different parts in operation in a store. Fig. 2 is an elevation of the car-lowering mechanism at the fixed end of the track, showing it in the upper position. Fig. 3 is an elevation of the same mechanism, showing it in the lower position. Fig. 4 is a side elevation of the parts at the movable end of the track. Fig. 5 is a view on a larger scale, showing the details of some of the mechanism at the fixed end of the track. Fig. 6 is a side view of a part of the car. Fig. 7 is a section of the same. Fig. 8 is a side view of the governor mechanism. Fig. 9 is a central section of the same. Fig. 10 is a detail view of the hanger-support. Figs. 11 and 12 are plan views of the attaching devices of the ends of the tracks detached.

My invention consists in the improved organizations of parts, which I will point out in detail by reference to the letters upon the drawings.

A in Fig. 1 indicates what may be assumed to be a cashier's desk and wrapper's counter, which is under the movable end of the track.

B indicates what may be assumed to be the salesman's counter, which is under what I call the "fixed end" of the track, although it has some little movement up and down.

C indicates the main track, and D the ceiling, to which the track-hangers or track-supports E and E′ may be assumed to be fixed.

F indicates a vertically-moving trolley, to which the movable end of the main track is secured.

G indicates a vertical tube, constituting a vertical track for the trolley, which tube is supported by the hangers E and is provided with suitable mechanism for holding the trolley up at its upper end automatically when the trolley is raised to that place and then automatically releasing it when the tension of the track is relaxed. This mechanism is best shown in Fig. 4.

H indicates a vertically-adjustable flat-open clamp-ring, which is placed around the upper end of the vertical track G and provided with a clamp-screw I. This ring can be secured in any desired position on the vertical track corresponding to the upward movement desired to be given the trolley, in order to secure the proper inclination of the main track.

K indicates a bracket, which is clamped between the ends L of the clamp-ring by means of the clamp-screw I. The base of the bracket rests upon the vertical track, and is provided at each end with a set-screw N. This bracket is provided with a hole through which passes a vertical tube O, that can be adjusted to any desired position vertically and held in place by set-screw P.

In practice the diameters of the tubes used for vertical tracks vary somewhat, even in the same tube. The clamp-rings are therefore formed to fit the maximum diameter of a tube of given trade-size—as, for example, an inch tube—so that the ring will always be large enough to pass over the largest diameters of such tubes where their diameters vary. After the clamp-ring has been adjusted to its proper position the set-screws N are screwed firmly against the vertical tube G, so as to hold the clamp-ring in place. The tube O is provided with a spring rod or plunger Q, having a coiled spring R arranged in the ordinary way, so that the spring tends to throw the plunger downward.

S indicates a metallic loop in the form of a clevis, which is pivoted at T to the frame of the trolley.

U indicates a lug upon the trolley-frame, which limits the downward movement of the clevis when turning upon its pivot.

V indicates a bifurcated arm projecting downward from the end of the clevis, between the parts of which is pivoted a lever or latch-bar W.

X indicates a casting, pivoted at Y to the clevis and having a downward projection Z, through which the latch-bar extends. The end *a* of this downward projection serves as a stop for the car.

The operation of these parts is as follows: The plunger Q, by the force of its spring, is normally down so as to bear against the short end of the latch-bar at *b* and hold up the latch end of the lever whenever the trolley is in its upper position, as shown in Fig. 4. Then the car is released, and moves by gravity toward the fixed end of the main track. After it has reached the fixed end of the main track and the tension of the track has become diminished, the trolley will be released and automatically descend to its lowest position. As soon as the tension of the main track is slackened the plunger Q, bearing upon the short end of the latch-bar, joins with the force of gravity to start the trolley downward, so that in case gravity should not be sufficient, as sometimes happens where the main track is lengthy, the plunger, acting by the force of its spring, supplements gravity and secures the release of the trolley and its descent. As soon as it descends the latch-bar drops to its lower position, ready to catch the car when it arrives at the cashier's desk and hold it.

c indicates a set-screw in the casting X, which is intended to clamp the main track and hold it firmly in its proper position.

d indicates holes in the casting X for receiving a cotter-pin *e*, which may be employed to secure the end of the main track to the casting. By having different holes the tension of the track may be increased or diminished according to circumstances, as desired.

f indicates an extension of the trolley-frame, to which is secured one end of a lifting-cord, which passes over a pulley *g*, and is provided with a handle *h*, for operating it to lift the trolley at the movable end of the track. As soon as the trolley is lifted to its upper position its upper wheel will ride over and rest against the upper edge of the clamp-ring H, and the tension of the main track will be sufficient to hold it there automatically until the tension is relaxed, as will now be explained by the delivery of the car at the fixed end of the track.

Referring to the mechanism at what I call the "fixed end" of the main track, *i* indicates a bar, to which the fixed end of the main track is secured in any suitable way, so that the bar constitutes a short continuation of the main track.

k indicates a curved lever pivoted to the hanger E′ at one end and also pivoted in a peculiar way to the bar *i*. The bar *i* is a casting bifurcated at *l*, and provided with a lug *m*, connecting the bifurcated parts. The lever *k* is also a casting, having an L-shaped recess *n*, adapted to receive the lug *m* of the bar. This L-shaped recess forms a very convenient means of connecting and disconnecting the bar and the lever. The function of the lever is to release the tension of the main track, so that the trolley at the movable end of the track may descend. For that reason the lever must be pivoted to the hanger and extend beyond the hanger on the side opposite the main track. Another function of the lever is to lower the car, and in this function it is aided by the pull-cord *o*, passing through the governor mechanism, (shown in Fig. 1,) which serves to prevent the lever and car from descending too rapidly, but secures their delivery at a moderate velocity. It is advantageous in passing a car from a tilting lever to a cord secured to the free end of the lever to have the lever curved, as shown, because as the lever descends the car-wheels follow the curve and remain substantially level, and a car will descend upon such a curved lever regularly instead of pitching down, as it would on a straight lever. In this governor mechanism *p* indicates a frame for securing it to the ceiling of a room, In this frame is carried a pulley *r*, upon the vertical shaft *s*, which is the governor-shaft.

u indicates a ratchet secured to the governor-shaft beneath the pulley, and *v* indicates a gravity-pawl in the lower end of the pulley and adapted to engage with the ratchet whenever the pulley is turned to the right, which is the direction given it when the car is descending.

w indicates a disk or plate forming a part of the governor-frame.

x indicates a disk secured on the governor-shaft and rotating with it, but adapted to move and down, as usual.

y indicates a sleeve fixed to the governor-shaft, forming the pivotal support of the governor-balls and seating one end of a spring *z*, coiled around the governor-shaft.

A^2 indicates a sliding sleeve, which seats the other end of the said spring, and is connected with the governor-balls by means of links B^2, pivoted as shown at C^2, all of well-known construction.

The sliding sleeve *y* bears against the central part of the disk *w* close around the shaft *s* under the center of gravity of the disk, so as to carry it up and cause it to operate as a frictional brake upon the bottom of the frame *p*. The spring *z* is so adjusted between the fixed sleeve *y* and the sliding sleeve A^2, and the links B^2 are also so adjusted that normally the governor-balls do not hang perpen-

dicularly from their pivots; but the tension of the spring tends to raise the sliding sleeve and to throw out the governor-balls somewhat. The result is that the governor-balls depend when at rest at a greater distance from the axis of rotation than they otherwise would, and they are therefore more affected by centrifugal force. Hence the balls are more sensitive to the speed of rotation, because they describe a larger initial circle than if they hung straight down from their pivots, so as to be when at rest close together. While the spring is of such tension and so compressed and adjusted as to serve the purpose described of keeping the governor-balls well apart when the governor is at rest, yet the spring has still another function. It tends to force the sliding sleeve *y* up against the disk *x*, and aids the governor-balls acting under centrifugal force in raising the disk and causing the proper brake action. There is, therefore, owing to the compression of the spring by the sliding sleeve through gravity acting upon the balls, a combined action of the balls and the spring to raise the disk and apply the brake as soon as the balls are put in rotation and begin to separate under the action of centrifugal force. The result of this organization is that the governor-balls are rendered very sensitive to the effect of rotation and respond with great nicety to slight variations of velocity of rotation, thus delicately regulating the motion of connected mechanism without shock, either on account of rapid increase or rapid diminution of speed, which can never occur. The cord *o* extends over pulley E^2, and is wrapped about twice around the governor-pulley *r*, one part of the cord passing over and the other part of it passing under an elongated guide-pulley F^2, which is the only new thing about the governor, thence back over pulley H^2, thence descending to the handle I^2. By this arrangement and the employment of the guide-pulley F^2 the cord, which is wrapped around the governor-pulley, is prevented from riding up upon itself. The cord can therefore be used freely without danger of its ever getting out of place. Its only use by an attendant is to elevate the car and on its way to the cashier's desk by merely pulling on the handle I^2.

Referring to Fig. 6, K^2 indicates plates pivoted at L^2 upon the lower part of the car-frame, and weighted at M^2, so that gravity tends to keep the plates all the time in a vertical position, therefore closing the spaces through the sides of the car-frame and preventing the car from coming off the track. At the same time, these plates being loosely pivoted, will be struck by the lower part N^2 of the hanger E′, and will give way, so that the car can pass without obstruction from the bar *i* onto the curved lever *k*.

Referring to Fig. 10, O^2 indicates a plate adapted to be bolted to the ceiling of a room by means, for example, of screws P^2. This plate has downwardly-projecting lugs Q^2, to which is pivoted by means of a tongue R^2, a sleeve S^2. This sleeve is provided with a set-screw T^2, and is adapted to receive the upper end of one of the hangers. By pivoting the sleeve to the plate and then securing the hanger within the sleeve by means of the set-screw I avoid such strain upon the screws holding the plate to place on the sleeve as is likely to loosen the screws and plate. When the hanger is applied to the plate fastened to the ceiling without pivoting, as has been done heretofore, the pull of the main track upon the hanger bends it to one side, more or less, and exerts a great leverage upon the plate and the screws which hold it. It is to avoid such strain as this, which often results in breaking the plate or screws or loosening them, that I employ the structure just described; but these devices are only used where the standards or supports are fastened below as well as above, so that strain on them would not make them swing freely.

In Fig. 10 I have shown the standard broken away below; but it is to be understood that in practice it would be fastened at the lower as well as the upper end.

By the use of my apparatus it will be observed that the attendants in a store are not required to lower either end of the main track or the car. They are also not required to use more than one pull handle and cord at either end of the track. All that is necessary for the perfect operation of my entire apparatus is for the cashier, for example, at the movable end of the track to pull down upon the handle and raise the trolley, which will elevate that end of the track and dispatch the car to its destination at the other end. When it arrives at the other end it will automatically descend and be delivered upon the salesman's desk, which will lower the track at the cashier's end. Then all the salesman has to do is to pull down handle I^2 and raise the cord and lever *k* to their proper positions, which will start the car back again to the cashier's desk, where it will be delivered and held by its latch in place. All complication in the use of the apparatus is avoided, and the sole duty of any attendant at either end of the main track is to pull down upon the handle of the cord within his convenient reach, when he is ready to dispatch the car. I thus produce a simple, convenient, and durable apparatus perfectly adapted to all the uses of store-service on a given floor.

I am aware that a straight bar having a cord connected at its end has been used to lower a car from a track in store-service apparatus; but such devices have been used in front of a hanger. The consequence is that they let a car drop too suddenly, and it pitches forward and strikes against the hanger below the track and often dumps its contents. To avoid this difficulty I use a curved bar in rear of the hanger, long enough to let the car down moderately. Besides this, the curve of the bar serves to gradually stop the forward mo-

tion of the car, and as there is in my apparatus no hanger or other obstacle in front of the car where it is being lowered and delivered, no shock is given it, and it descends gradually and smoothly without danger of dumping its contents.

What I claim is—

1. In a store-service apparatus, the combination, with the vertical tubular track G, the vertically-adjustable flat open clamp-ring H, secured thereto and provided with the screw I, and the bracket K, provided with set-screws N, adapted to be adjusted to accommodate the open clamp-ring to varying diameters of vertical tubular tracks, substantially as set forth.

2. In a store-service apparatus, the combination, with the vertical tubular track, of the clamp-ring H, the bracket K, the vertically-adjustable tube O, movable in a hole in the bracket, the set-screw P, the spring-rod Q, and the pivot latch-bar W, substantially as set forth.

3. In a store-service apparatus, the combination of the main track secured to a vertically-moving trolley, a vertical track for the trolley, a casting S, pivoted to the trolley and sustaining the strain of the main track, and a lug U upon the trolley-frame limiting the downward movement of the casting, substantially as set forth

4. In a store-service apparatus, the combination, with a vertical track, of a vertically-moving trolley, the casting S, pivoted to the trolley-frame, the casting X, pivoted to the casting S, to which the movable end of the main track is secured, a downward projection Z of the casting, and the latch-bar W, which extends through the casting, substantially as set forth.

5. In a store-service apparatus, the combination, with the main track, of the bar i, to which the end of the track is secured, and a curved lever k, having the L-shaped recess n and pivoted to the hanger E′ at one end, and also pivoted to the bar i by means of the lug m and the L-shaped recess n, substantially as set forth.

6. In a store-service apparatus, the combination, with the main track, bar i, and curved lever k, of the pull-cord o and the governor mechanism substantially such as described, provided with the elongated guide-pulley F^2, substantially as set forth.

7. In a store-service apparatus, the combination of a plate O^2, adapted to be screwed to the ceiling of a room, provided with downwardly-projecting lugs Q^2, a sleeve S^2, provided with a tongue R^2, which is pivoted to the lugs, the set-screw T^2, and a hanger adapted to fit into the sleeve and be held by the set-screw, whereby injurious strain upon the plate and its holding-screws is prevented, substantially as set forth.

8. The combination, with the shaft s, of the fixed sleeve y, the sliding sleeve A^2, the spring z, the governor-balls, the links B^2, and the disk w, all constructed and arranged substantially as and for the purpose specified.

In testimony of all which I have hereunto subscribed my name.

CHARLES W. McCORMICK.

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