

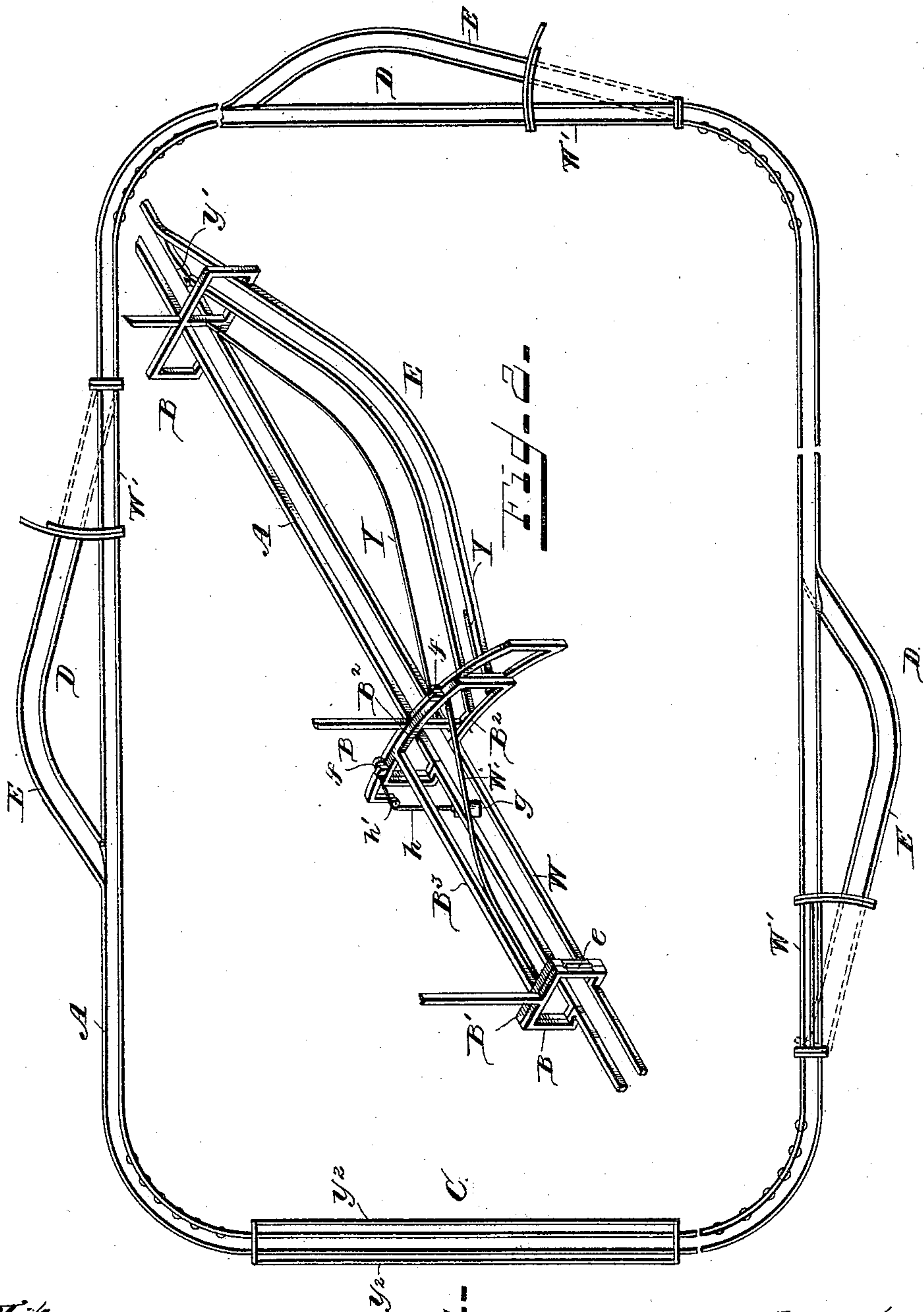
(No Model.)

4 Sheets—Sheet 1.

R. B. WILSON.
STORE SERVICE APPARATUS.

No. 454,793.

Patented June 23, 1891.



Witnesses.

J. Thomson Cross
Charles Billow

Inventor.

Robert B. Wilson
per Peck & Reitor
Attorneys.

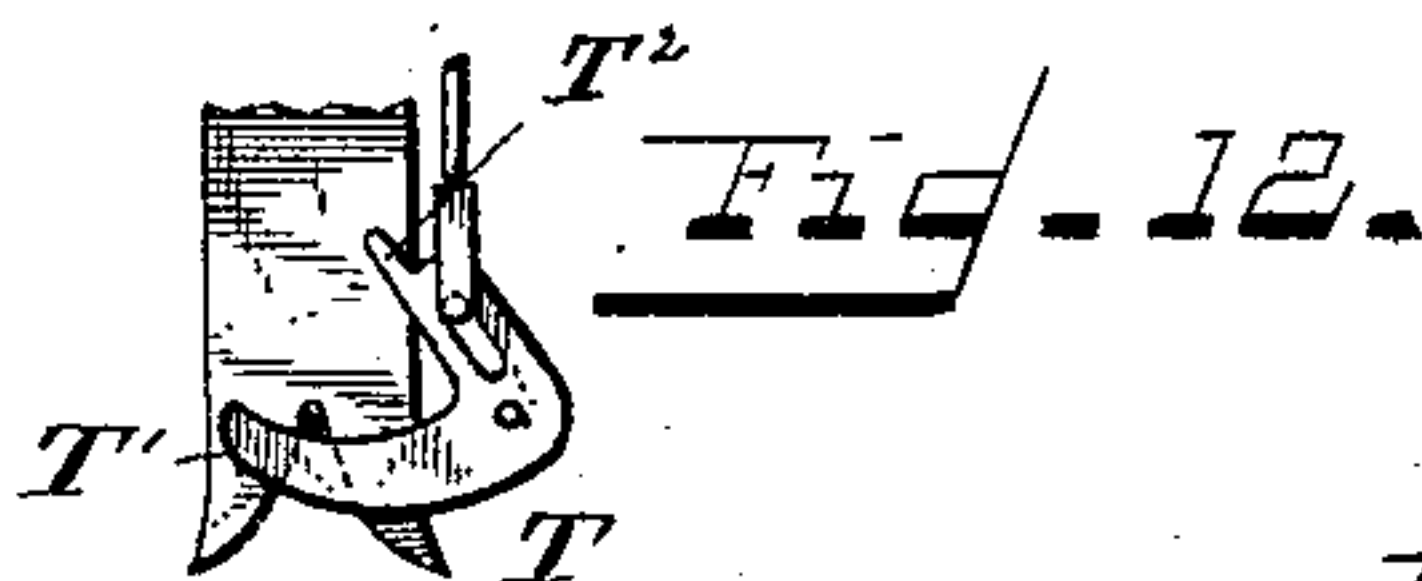
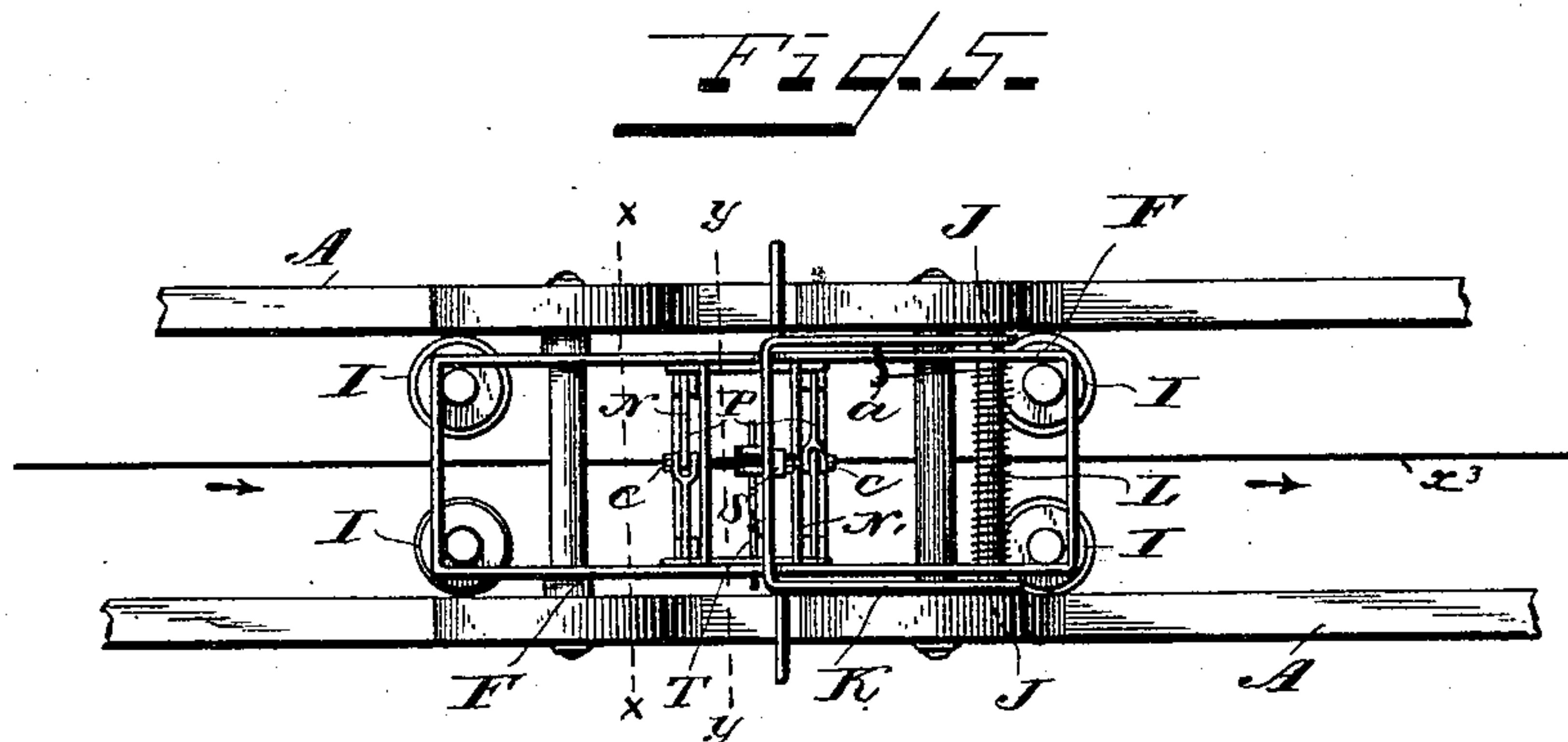
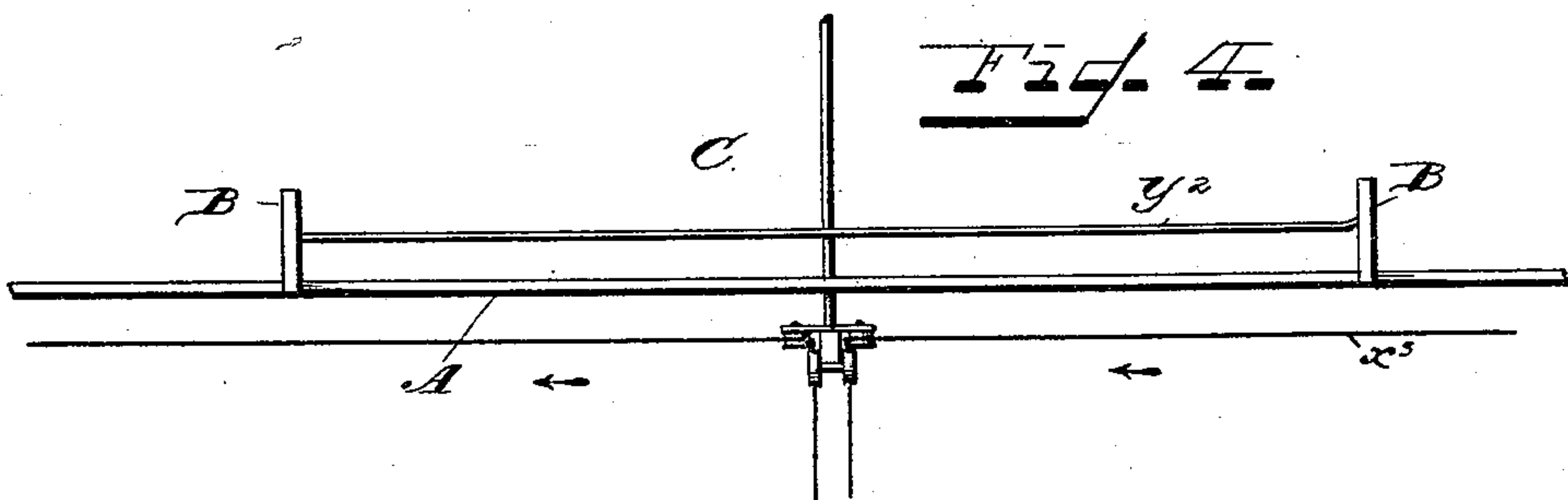
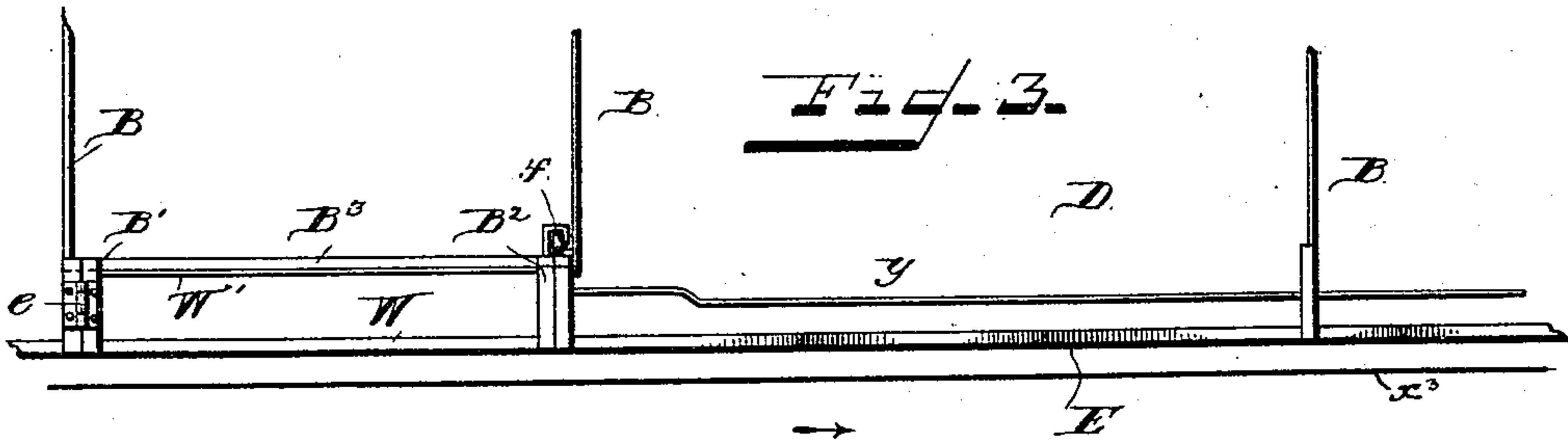
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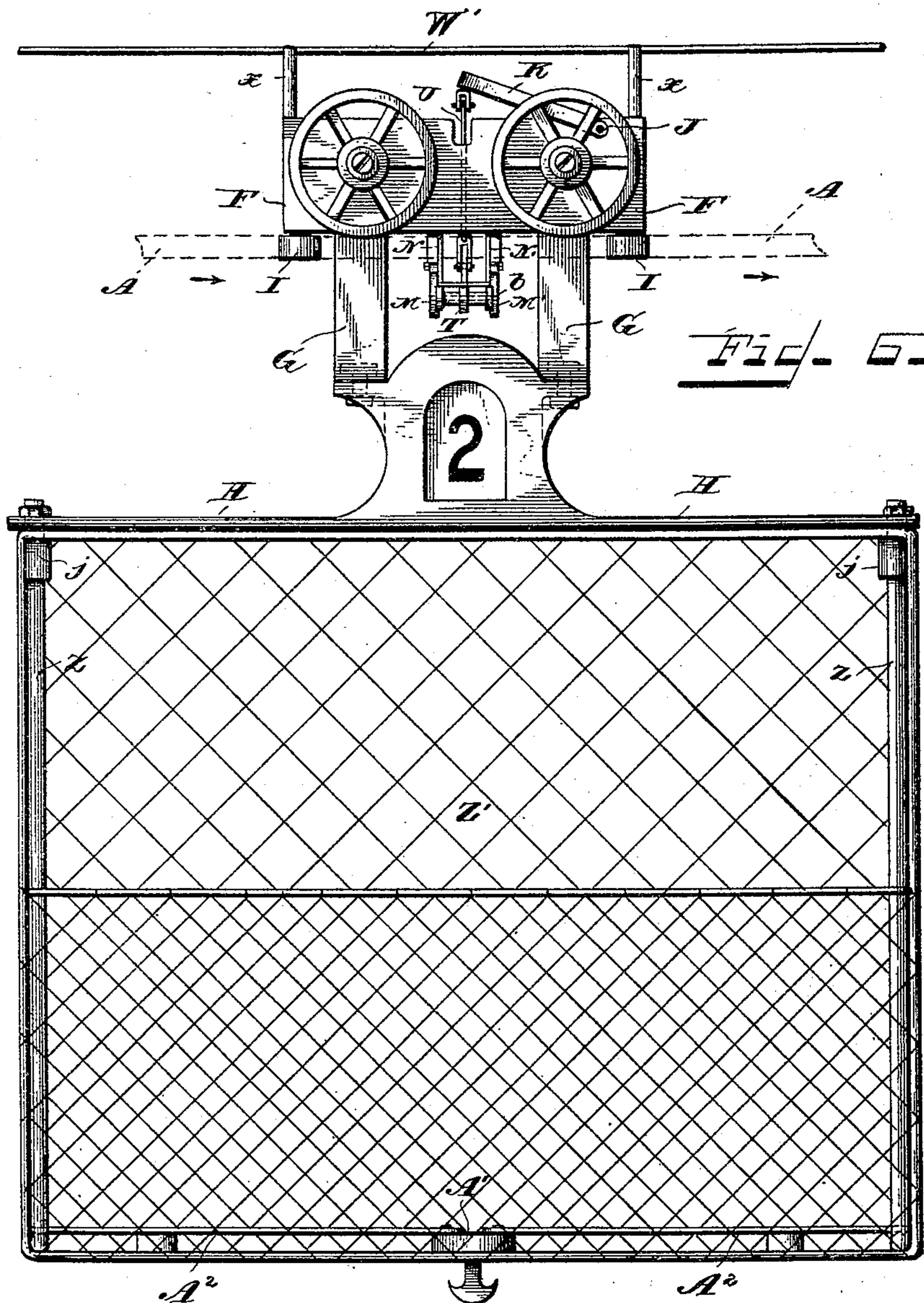
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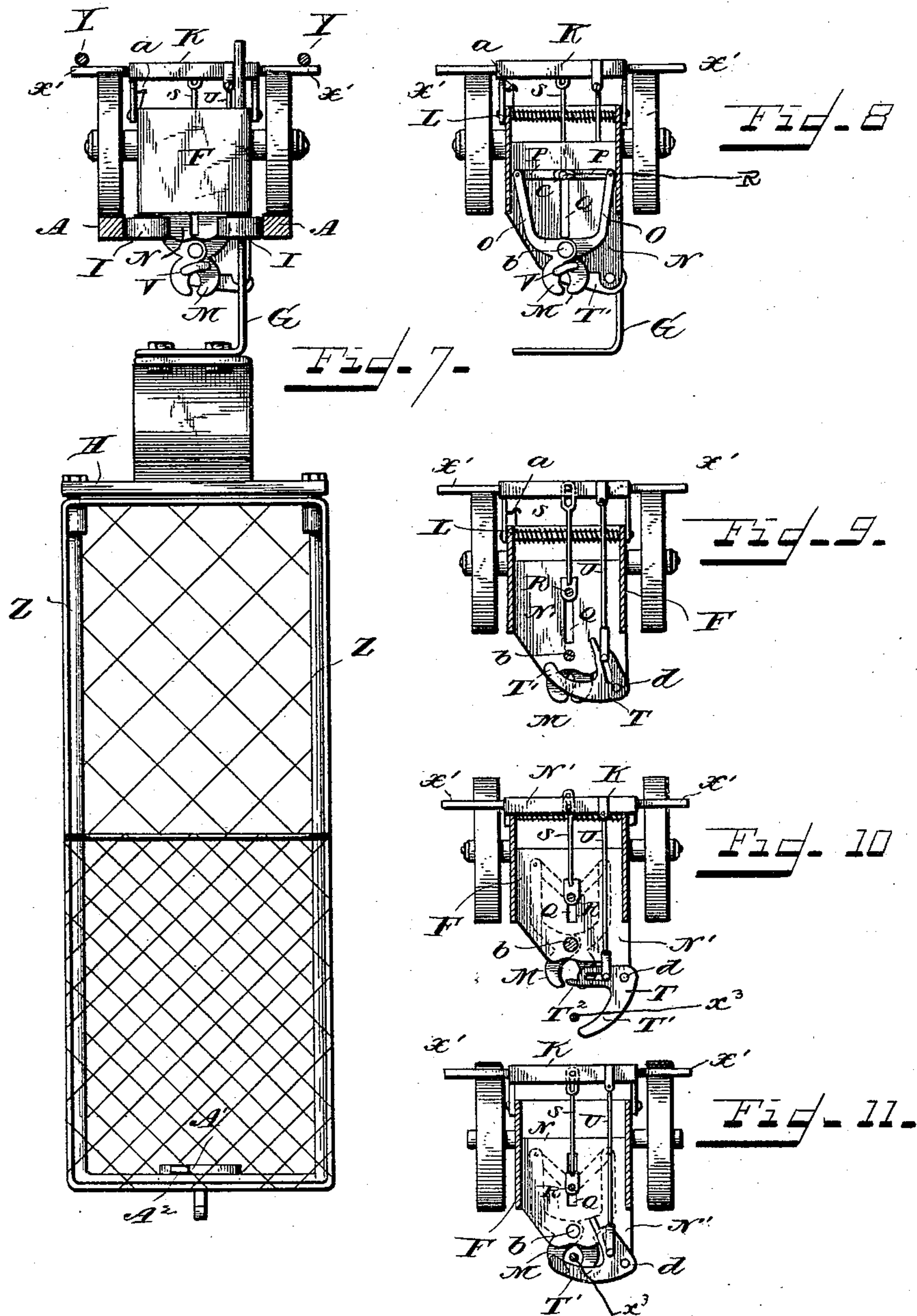
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Patented June 23, 1891.



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UNITED STATES PATENT OFFICE.

ROBERT B. WILSON, OF CINCINNATI, OHIO, ASSIGNOR OF THREE-FOURTHS
TO WILLIAM S. JOHNS AND W. TYSON JUDKINS, OF SAME PLACE.

STORE-SERVICE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 454,793, dated June 23, 1891.

Application filed September 25, 1890. Serial No. 366,087. (No model.)

To all whom it may concern:

Be it known that I, ROBERT B. WILSON, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Store-Service Apparatus, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of store-service apparatus in which the carriers are propelled along the track by an endless cable, to which the carriers are attached by suitable grip mechanism. The track consists of a main track extending from the sub-stations to the central station and a side track or switch at each sub-station. The carriers are automatically detached from the main track when they reach their proper stations.

My invention relates more particularly to parcel or package carrying apparatus, and its novel features relate principally to the automatic switch for directing the carriers from the main track to their respective side tracks and to the grip mechanism for automatically attaching the carriers to and detaching them from the cable.

In the accompanying drawings, Figure 1 is a plan view of a main track and side tracks, illustrating my invention. Fig. 2 is an enlarged perspective view of a section of main track, a side track, and an automatic switch at one of the sub-stations. Fig. 3 is a side elevation of the same. Fig. 4 is a side elevation of the main track and grip-releasing devices at the central station. Fig. 5 is a top view of the carrier. Fig. 6 is a side elevation of the carrier and basket. Fig. 7 is an end elevation of the same. Fig. 8 represents a transverse vertical section of the carrier on the line xx of Fig. 5. Fig. 9 is a similar view on the line yy of Fig. 5. Fig. 10 is a corresponding view with the grip open. Fig. 11 is a corresponding view with the grip partly closed. Fig. 12 represents a modified form of grip-jaws.

The same letters of reference are used to indicate identical parts in all the figures.

The main track A, consisting of two rails, is supported from above by suitable hangers

and brackets B, Figs. 1 and 2. It extends from the central station, or cashier's and wrapper's desks, at C, entirely around the room, and at each sub-station D, three of which are shown in Fig. 1, it has adjacent to it a side track E, to which the carriers belonging to that station are automatically switched in the manner hereinafter described. The endless cable α^3 , suitably supported, travels in the direction of the arrows beneath main track A, so that the carriers are received at the central station at the left side and delivered therefrom to the sub-stations on the right side. Each carrier therefore in going to and returning from the central station travels entirely around the main track. As the carriers reach the central station their grips are automatically opened and the carrier thereby released from the cable and arrested. When the goods contained in the basket have been wrapped and the package placed in the carrier, together with the check or change, if any, from the cashier, the carrier is simply pushed on to the right and becomes automatically reattached to the cable and carried back to its station, all as will be hereinafter described.

The carrier is supported on the track by four wheels, Fig. 5. It consists of a suitable metal frame F, supporting the grip mechanism and carrying two pendent arms G, extending down between the track-rails and having the basket-frame H secured to their lower ends. At each of the four lower corners of the frame F is a horizontal roller I, these rollers bearing against the inner sides of the track-rails and serving to steady and hold the carrier on the track.

Pivottally supported by its side arms on the frame of the carrier at J, Figs. 5 and 6, is a frame K. This frame is normally held in the position shown in Fig. 6 by a spiral spring L, Fig. 5, surrounding a cross-rod of the frame, one end of the spring being secured to the carrier-frame and the other hooked to the swinging frame K at a . The two sets of grip-jaws M M are pivottally supported at b on the outer sides of two pendent transverse plates N N' of the carrier-frame, Figs. 5 to 11. Each jaw M, as shown in Fig. 8, has an arm O extending upward and outward from

its pivotal support at *b*. The upper ends of the two arms *O* of each set are connected by two links *P P*, pivoted together at their inner ends at *c* to form a toggle. The two plates *N N'*, to which the jaws *M* are pivoted, are provided with vertical slots *Q*, and a rod *R*, extending through the slots connects, the central joints of the two toggles, the ends of the rod *R* in this instance passing directly through the holes in the ends of the links *P P* and forming the pivot which connects them. A link *S*, secured at its lower end to the rod *R* at a point between the two plates *N N'*, connects the rod with the cross-piece of the swinging frame *K*, so that when said frame is depressed against the resistance of the spring *L* the rod *R* and the central joints of the toggles are depressed, the upper ends of the jaw-arms *O* pulled toward each other, and the jaws *M* thrown open, as seen in Fig. 10, thereby releasing the cable.

Pivoted between the plates *N N'* at *d* is a bell-crank plate *T*, having one arm slotted and the other forming a finger *T'*, extending laterally between the two sets of jaws *M*, as shown. A link *U*, whose lower end carries a pin confined in the slot in the plate *T*, connects the latter with the swinging frame *K*, so that when the frame is depressed the finger *T'* is also depressed to permit the cable to drop from between the jaws *M*, as seen in Fig. 10. When the frame *K* is released and again lifted by its spring *L*, the finger *T'* picks up the cable and lifts it up between the jaws, and the latter close upon it under the pressure of the spring *L*, exerted through the frame *K*, link *Q*, and toggles *P P*, and grip the carrier to the cable again.

Owing to the nearly vertical position of the slot in the plate *T*, the latter is only slightly rocked on its pivot as the frame *K* and link *U* are depressed until the pin in the lower end of the link *U* reaches the bottom of the slot, whereupon the further depression of the frame and link quickly rocks the plate to its full limit of play and throws down the finger *T'* to the position shown in Fig. 10. So when the frame is released and lifted by its spring the first upward motion of the finger *T'* is quick, so that it carries the cable up between the jaws *M* before the latter have a chance to close. To this end also the upper end of the link *S*, which operates the jaws from the frame *K*, is connected to the latter by a slot-and-pin connection, so that as the frame is depressed it does not act on the link and jaws until the pin on the frame reaches the lower end of the slot in the link. After the frame has been completely depressed and is released the jaws do not begin to close until the pin has moved to the upper end of the slot, and during this time the quick upward movement of the finger *T'* takes place, so that the latter has reached the position shown in Fig. 11 and lifted the cable up between the jaws before the latter begin to close.

To insure the disengagement of the cable

from the jaws when the latter are opened by the depression of the frame *K*, the plate *T* has a projection *T²* substantially at right angles to the finger *T'*, which projection as the finger is depressed strikes the upper side of the cable and forces it from between the jaws. The outer jaw *M* of each set has secured to it a small curved plate *V*, Figs. 7 and 8, which overlaps the face of the other jaw of the set. This plate *V* arrests the cable as it is lifted by the finger *T'* and prevents it being carried above the gripping-faces of the jaws.

While I have illustrated and described the pivoted spring-jaws *M* and cable-lifting finger *T'* as combined and co-operating with each other, yet each of them separately forms a novel feature of my invention. Thus the spring-jaws might be so shaped as to constantly straddle the cable, both when open and closed, so that the lifting-finger would be unnecessary. Again, the lifting-finger might be employed to advantage in combination with stationary jaws formed simply of a slotted plate—such, for instance, as that shown in Fig. 12. By the employment of two such plates with the lifting-finger between them and a strong spring applied to the frame *K* the finger could be made to press so tightly into the slots and between the plates as to firmly grip the cable, while the projection *T²* on the plate *T* would insure the disengagement of the cable from the jaws when the frame *K* was depressed. Again, inasmuch as the only office of the swinging frame *K* is to operate the grip-jaws and cable-lifting finger through the medium of the links *S* and *U*, attached to the cross-piece of the frame, it is evident that a vertically-reciprocating frame or cross-piece, suitably supported in guides on the carrier-frame and held up by springs might be substituted for the pivoted frame and the links *S* and *U* be connected to it in the same manner as to the swinging frame.

Having described above how the carrier is released from the cable by the depression of the frame *K* and regripped to it by the resetting of the frame, I will now explain how the frame is depressed in the use of the carriers in my improved apparatus to automatically release the carrier from the cable when it reaches the central station or the side track of its own station, and how it is automatically regripped to the cable as it is pushed on past the central station or out onto the main track from its own side track.

The automatic switch by which each carrier is directed from the main track to the side track of its own proper station is best illustrated in Fig. 2. At the entrance to each side track the main track is cut in two and provided with a hinged section *W*, which can swing laterally into line with the side track *E* and back into line with the main track. In Fig. 2 this hinged section of the main track is shown as composed of the two track-rails secured at their opposite ends to

the lower open sides of rectangular brackets $B' B^2$, the two brackets being connected at their tops by a brace-rod B^3 . The bracket B' is hinged to a bracket B , supporting the end of the main track, by a hinge at e . The bracket B^2 is curved to conform to the arc of the circle in which it moves, and the adjacent face of the bracket B conforms to the same curve. Carried on studs on the top of the bracket B^2 are two rollers $f f$, which extend over and rest on the top of the bracket B , the latter forming the support for this end of the track-section. A curved guide-wire W' extends beneath the brackets B' and B^2 in the direction shown and is secured at its opposite ends to pendent supports on the under sides of the tops of the brackets $B B$. Each carrier has on it one, or preferably two, upwardly-extending pins or projections x , Figs. 6 and 7. These pins are of different lengths on different carriers and arranged in such relative positions on the different carriers that the pins on each carrier will engage the guide-wire W' at the station to which the carrier belongs, but will clear all the others. Thus when a carrier belonging to the station represented by Fig. 2 reaches the swinging track-section W its pins $x x$ will engage the right-hand side of the wire W' , and as the carrier is gripped to the cable and is carried along by it the pin x is forced along the side of the wire W' . As the carrier is held to the track by the rollers I , it pulls the swinging section into line with the side track E and the carrier passes onto the side track. As soon as the carrier leaves the swinging track-section a weight g on the end of a cord h , carried over a pulley i on the bracket B and secured to the bracket B^2 , (or a suitably-applied spring instead of the weight,) returns the swinging section to normal position in line with the main track, so that carriers belonging to other stations which may follow can pass by unobstructed. As the side-tracked carrier reaches the side track E two laterally-projecting pins $x' x'$ on its swinging frame K ride under two wires $Y Y$, one above and just outside of each of the track-rails, which depresses the frame K , thus releasing the cable in the manner heretofore explained, and the latter, which has been pulled from its course under the main track by the carrier, returns to its normal position, while the carrier, owing to the friction of the pins $x' x'$ against the wires $Y Y$ under the tension of the spring L , is arrested at the station. When it is desired to send the carrier to the central station, it is simply pushed on out the opposite end of the side track onto the main track, a pivoted switch y' forming the necessary track connection, and returning to normal position under pressure of any suitable spring when the carrier has passed to the main track. Just as the carrier reaches the main track and the open grip has passed into line with the cable, with the finger T' immediately below it, as seen in Fig. 10, the

pins $x' x'$ on the frame K pass from under the ends of the wires $Y Y$, the frame is reset by its spring L , the finger T' lifts the cable up between the jaws M , and the carrier is automatically regripped to the cable and carried on by it to the central station C .

The only devices employed at the central station C for releasing the carriers from the cable and arresting them are two wires $y^2 y^2$, parallel with the track and arranged in the same relative position thereto as the wires $Y Y$ to the side track. The pins $x' x'$ on the frame K ride under these wires $y^2 y^2$ and depress the frame, thereby releasing the cable, while the carrier is arrested by the friction of the pins $x' x'$ on the wires. When the package has been wrapped and replaced in the carrier, the latter is simply pushed on to the right, and as the pins $x' x'$ pass from under the ends of the wires $y^2 y^2$ and release the frame K the finger T' picks up the cable again and lifts it between the jaws M , which close upon it, and the carrier travels on to its proper station. It will thus be seen that all the carriers are released from the cable and arrested at the central station, but at each side track only such of them as belong to that particular station.

The basket-supporting frame is composed of the rectangular top plate H , Figs. 6 and 7, by which it is secured to the arms G , depending from the carrier, and four pendent rods Z , one at each corner of the plate H . The opposite rods at each end of the plate are joined by a cross-rod at their lower ends, or the three rods may be bent from a single piece of heavy wire. The basket Z' is rectangular in shape and preferably composed of wire. It surrounds the bottom and sides of the supporting-frame, but is mounted on the latter at its top by sleeves j , encircling the rods Z at each corner of the basket. In the bottom of the basket is an oscillating plate A' , having a thumb-piece extending through the bottom. To this oscillating plate are secured two latch-rods A^2 , extending to the ends of the basket and projecting over the cross-rods of the supporting-frame. When the plate A' is oscillated by the thumb-piece and the latch-rods withdrawn from engagement with the cross-rods of the supporting-frame, the basket may be lowered on the rods Z until the sleeves j rest on the cross-rods at their lower ends. This gives more easy access to the basket. When the carrier is ready to be sent out on the track, the basket can be pushed up and latched in the position shown in the drawings. I prefer to construct the basket with its top closed and formed of the plate K , and with the upper half of one of its sides open, as shown, though it may be made in any other suitable manner.

I am aware that automatic switches operated by the carriers are old in store-service apparatus, and do not claim the same, broadly, as my invention; but I believe I am the first to combine a main track and side track of

any sort with a laterally-movable section of the main track and a guide which is engaged by the carrier while traveling in the line of the main track and causes the latter to pull the main-track section into line with the side track, so as to automatically switch the carrier onto the side-track, and my invention contemplates, broadly, the combination of those elements operating in the manner described, regardless of the particular form and arrangement of them. I am also aware that carriers in such apparatus have been provided with grips, which were released automatically by trips located adjacent to the track; also, that it has been proposed to automatically regrip the carrier to the cable by means of devices located adjacent to the track and acting on the jaws of the grip; but I believe the gripping mechanism which I employ for the purpose of automatically releasing the carrier from the cable and automatically regripping it thereto is broadly new, both in construction and mode of operation.

Having thus fully described my invention, I claim—

1. In a store-service apparatus such as described, the combination of a main track, an endless cable for propelling the carriers thereon, a side track adjacent to the main track, a swinging section in the main track capable of being moved into line with the side track, a carrier traveling upon the main track and provided with a grip for gripping it to the cable, a guide located in the path of the carrier upon the main track and arranged to be engaged by the carrier while the latter is gripped to the cable to cause the carrier to pull the swinging section of the main track into line with the side track, and a trip for automatically releasing the carrier's grip from the cable when the carrier is switched to the side track, substantially as described.

2. In a store-service apparatus such as described, the combination of the main track composed of two track-rails, an endless cable for propelling the carriers thereon, a side track composed of two track-rails adjacent to the main track, a swinging section in the main track capable of being moved into line with the side track, a four-wheeled carrier traveling upon the main track and provided with a grip for gripping it to the cable, a guide located in the path of the carrier upon the main track and arranged to be engaged by the carrier while the latter is gripped to the cable to cause the carrier to pull the swinging section of the main track into line with the side track, a trip for automatically releasing the carrier's grip from the cable when the carrier is switched to the side track, and means for automatically restoring the swinging section to the line of the main track, substantially as described.

3. In a store-service apparatus in which the carriers are gripped to an endless cable, the combination, with the carrier, of a vertically-movable frame arranged to be auto-

matically depressed by devices located adjacent to the track, a spring for automatically resetting said frame, a pair of jaws, and a cable-lifting finger lifted by the resetting of the movable frame to carry the cable up between the jaws, substantially as described.

4. In a store-service apparatus such as described, the combination, with the carrier, of a vertically-movable frame arranged to be automatically depressed by devices located adjacent to the track, a spring for automatically resetting said frame, a pair of pivoted grip-jaws opened by the depression of the frame and closed by the resetting of the same, and a cable-lifting finger lifted by the resetting of the frame to carry the cable up between the grip-jaws, substantially as described.

5. In a store-service apparatus such as described, the combination, with the carrier, of a vertically-movable frame arranged to be automatically depressed by devices located adjacent to the track, a spring for automatically resetting said frame, a pair of pivoted grip-jaws, a cable-lifting finger, and connections between the jaws and finger and the movable frame, by which the jaws are opened and the finger lowered upon the depression of the frame and by which upon the resetting of the frame the finger is lifted in advance of the closing of the jaws to carry the cable up between them, substantially as described.

6. In a store-service apparatus such as described, the combination, with the carrier, of a vertically-movable frame arranged to be depressed against the resistance of a spring by devices located adjacent to the track, a pair of jaws, and a rocking plate connected with the movable frame and provided with a cable-lifting finger and with a cable-disengaging finger or projection, whereby the latter on the depression of the movable frame disengages the cable from the jaws and the former on the resetting of the frame lifts the cable up between the jaws, substantially as described.

7. In a store-service apparatus such as described, the combination, with the carrier, of a vertically-movable frame arranged to be automatically depressed by devices located adjacent to the track, a spring for automatically resetting said frame, a pair of pivoted grip-jaws, and toggle mechanism interposed between the jaws and movable frame, whereby the depression of the latter opens the jaws and the resetting of it closes them, substantially as and for the purpose described.

8. The combination, with the carrier-frame F, of the swinging frame K, the spring for automatically resetting said frame, the pivoted jaws M M, having the upwardly-extending arms O O, the toggle P P, connecting the ends of the arms, and the link S, connecting the toggle with the frame K, whereby the depression of the frame K operates the toggle to open the jaws and the resetting of the frame

operates it to close the jaws, substantially as described.

9. The combination, with the carrier-frame F, of the swinging frame K, the spring for resetting said frame, the two sets of pivoted jaws M M, having the upwardly-extending arms O O, the two toggles P P, one connecting the upper ends of each pair of arms O O, the rod R, connecting the central joints of the two toggles, and the link S, connecting the rod R with the frame K, substantially as and for the purpose described.

10. The combination, with the carrier-frame F, of a swinging frame K, a pair of jaws carried by the frame F, the finger T', and the link U, connecting it with the frame K, substantially as and for the purpose described.

11. The combination, with the carrier-frame F, of a swinging frame K, a pair of jaws carried by the frame F, the rocking plate T, carrying the finger T' and projection T², and the link U, connecting the plate T and frame K, substantially as described.

12. The combination, with the carrier-frame F, of the swinging frame K, the pivoted jaws M M, having the arms O O, the toggle P P, connecting the ends of said arms, the link S,

connected at its lower end with the central joint of the toggle P P, and connected at its upper end with the frame K by a slot and pin, the slotted plate T, carrying the finger T', and the link U, having a pin at its lower end confined in the slot in the plate T and connected at its upper end with the frame K, whereby the rising of the frame K after it has been depressed to open the jaws M M and lower the finger T' causes the finger to move upward in advance of the closing of the jaws and carry the cable between them, substantially as described.

13. The combination, with the carrier, of the basket - supporting frame composed of the rectangular top plate H and the four pendent rods Z, carried thereby, one at each of its four corners, the basket Z', provided at each of its four corners with a sleeve j, surrounding one of the rods Z, and a horizontally-sliding latch beneath said basket and by which the latter may be held in elevated position, substantially as set forth.

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Witnesses:

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CHARLES BILLON.