

(No Model.)

6 Sheets—Sheet 1.

A. S. KROTZ.
CONVEYING APPARATUS.

No. 603,607.

Patented May 3, 1898.

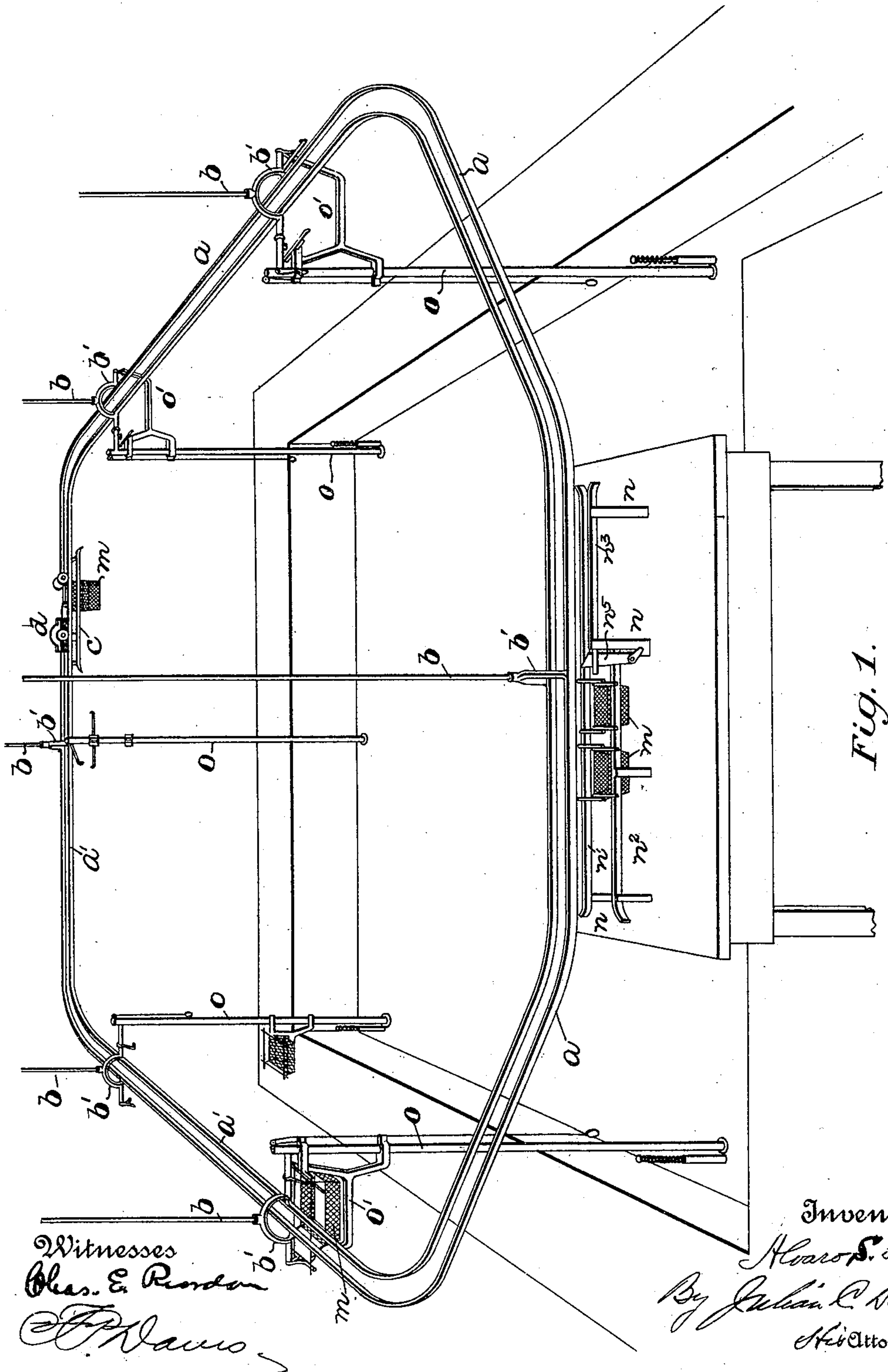


Fig. 1.

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By Julian C. Howell
His Attorney

(No Model.)

6 Sheets—Sheet 2.

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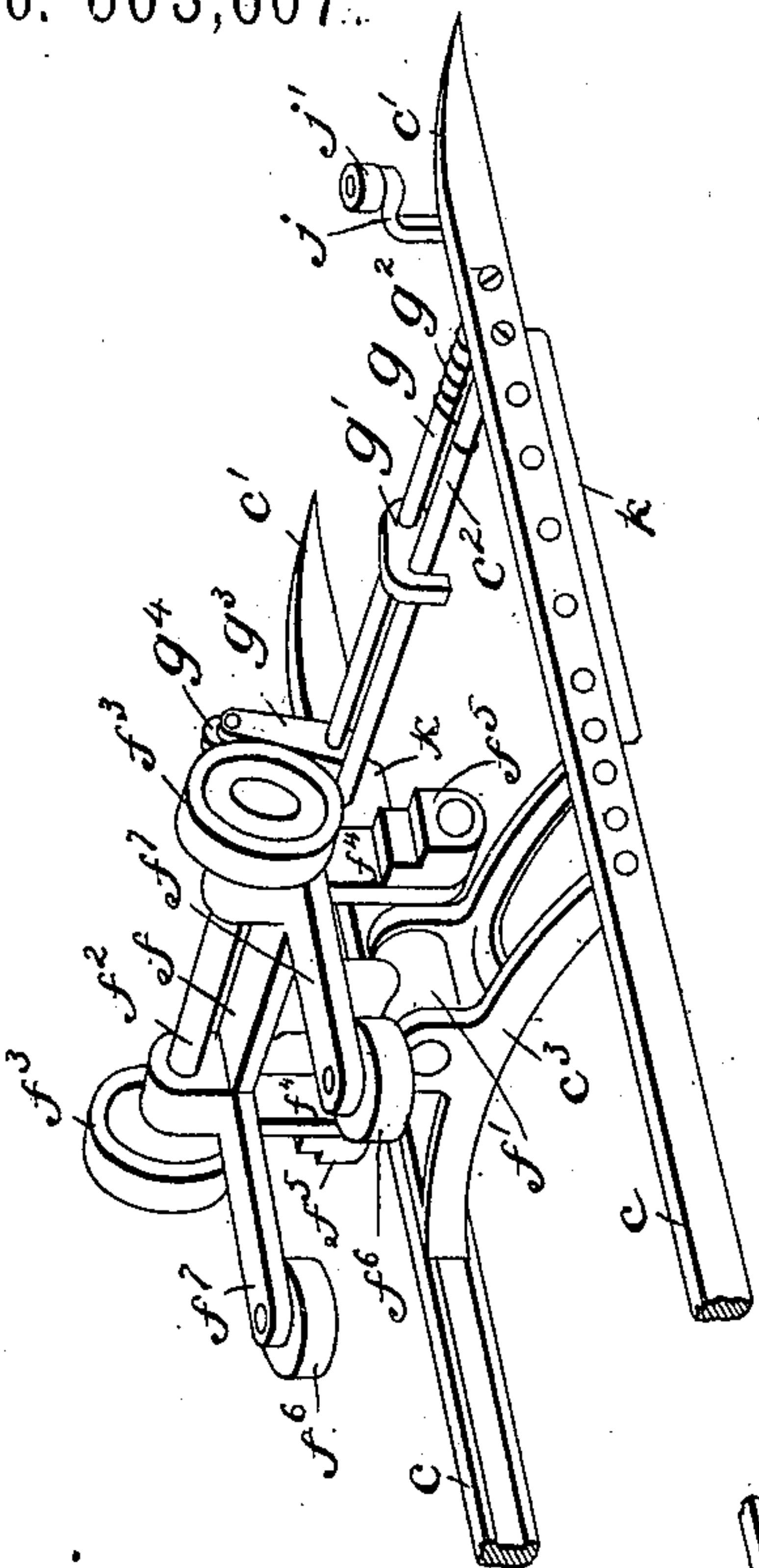


Fig. 2.

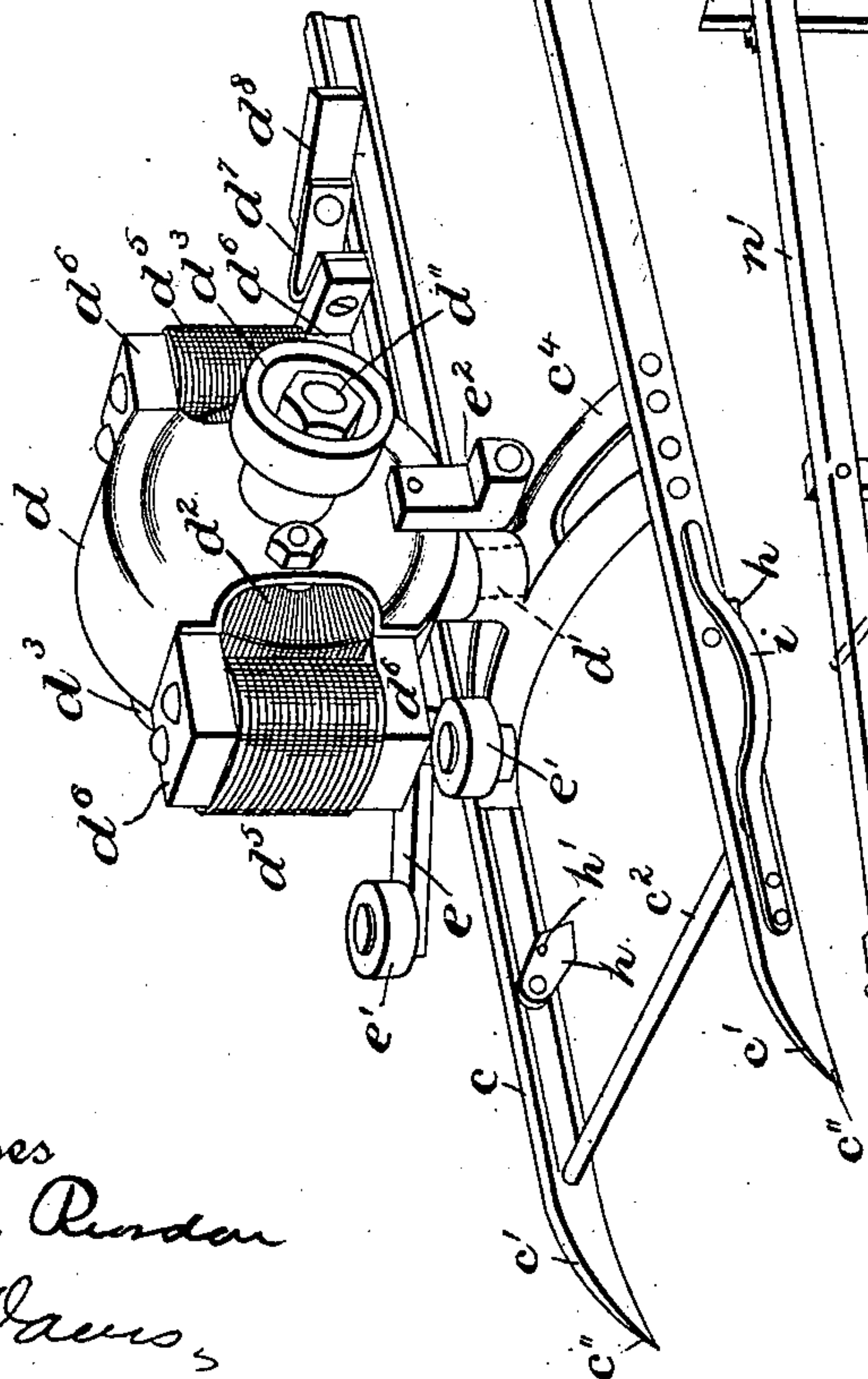
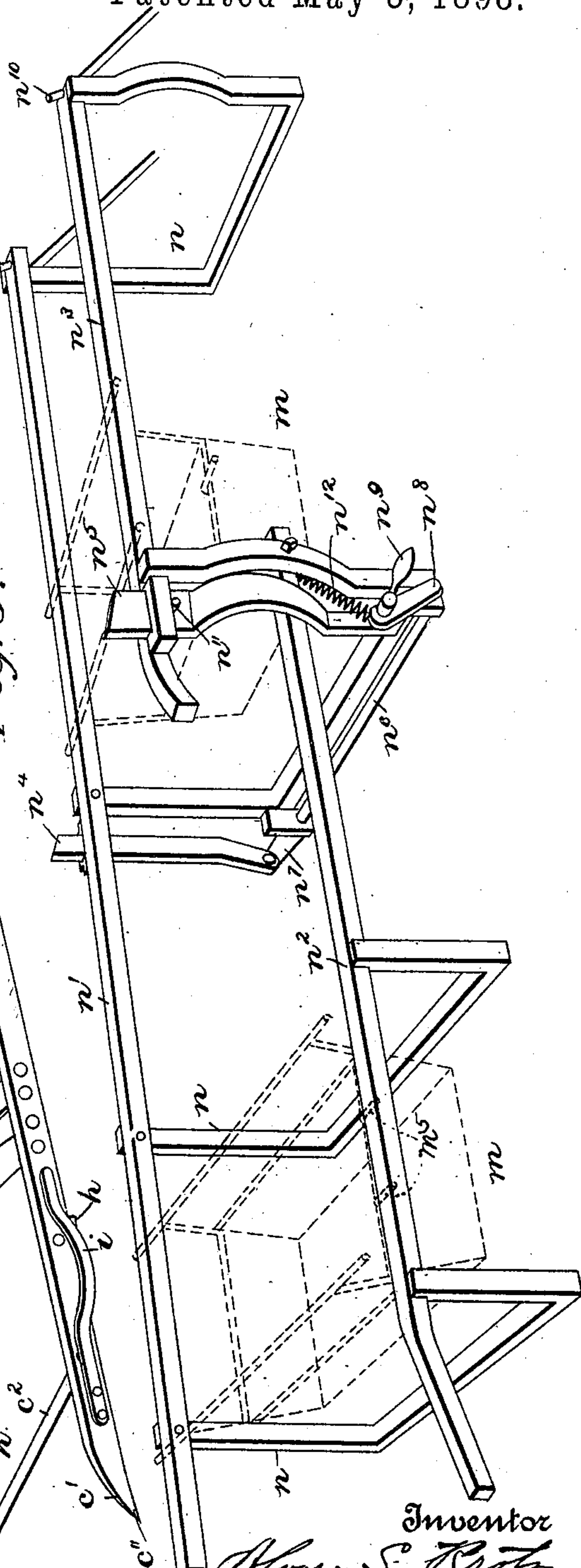


Fig. 3.



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(No Model.)

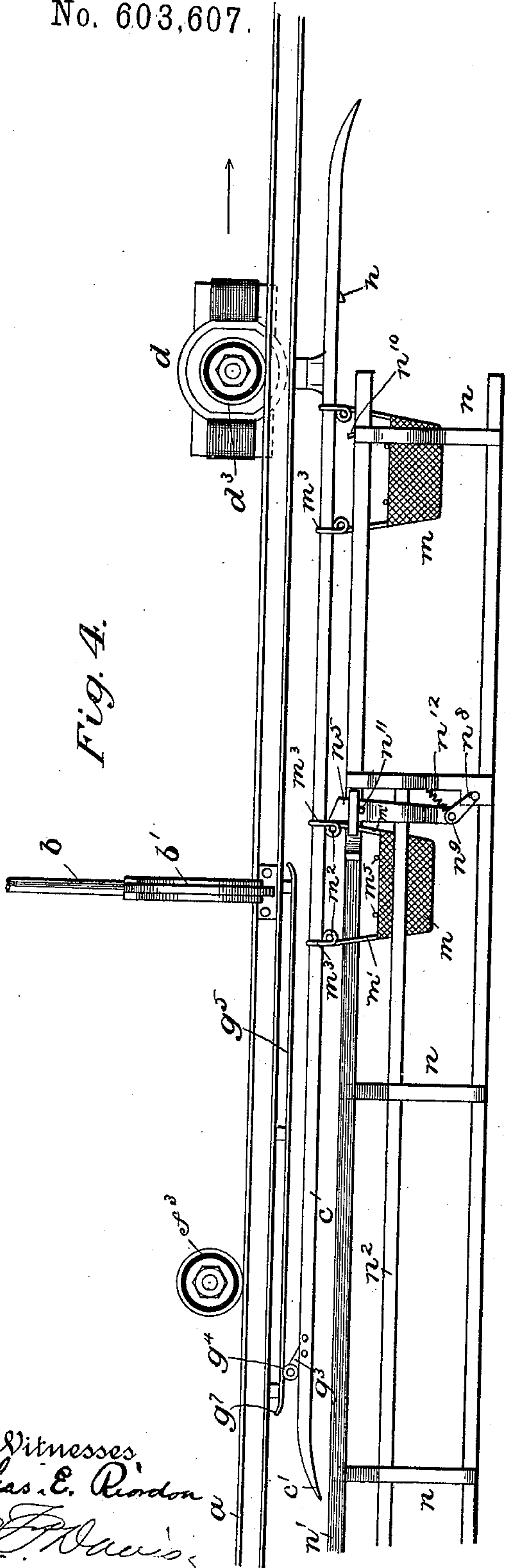
A. S. KROTZ.
CONVEYING APPARATUS.

6 Sheets—Sheet 3.

No. 603,607.

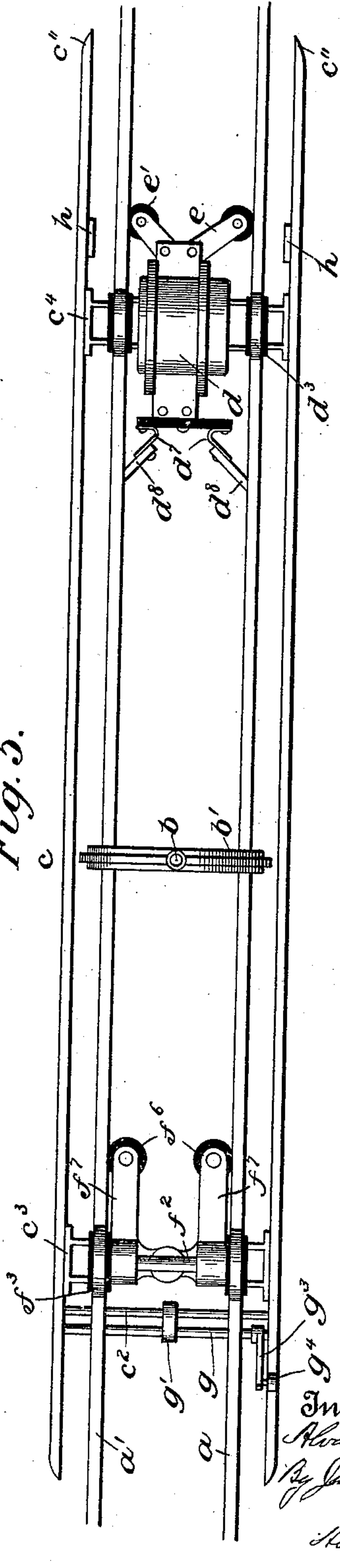
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Fig. 4.



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Fig. 5.



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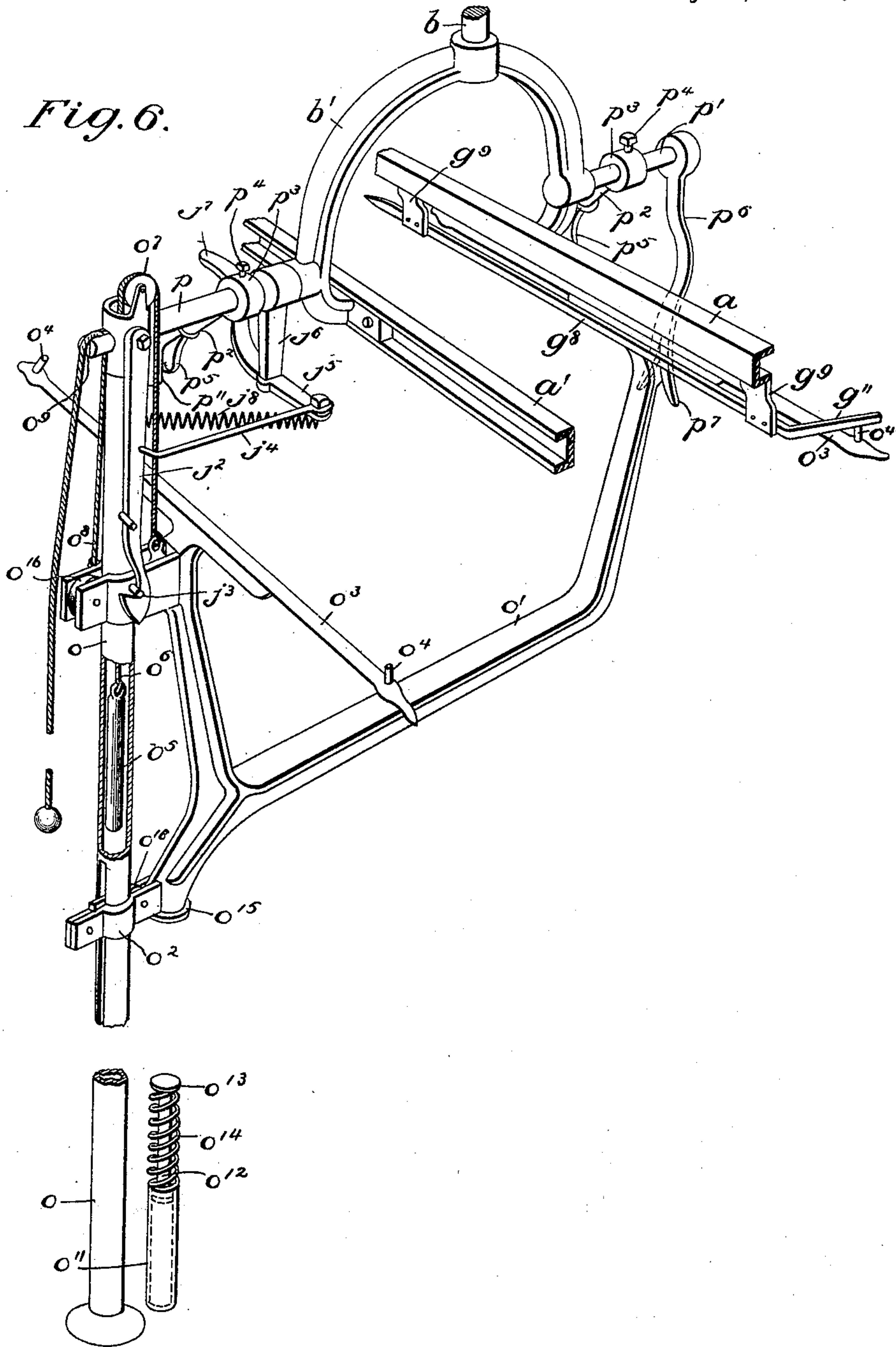
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Fig. 6.



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6 Sheets—Sheet 5.

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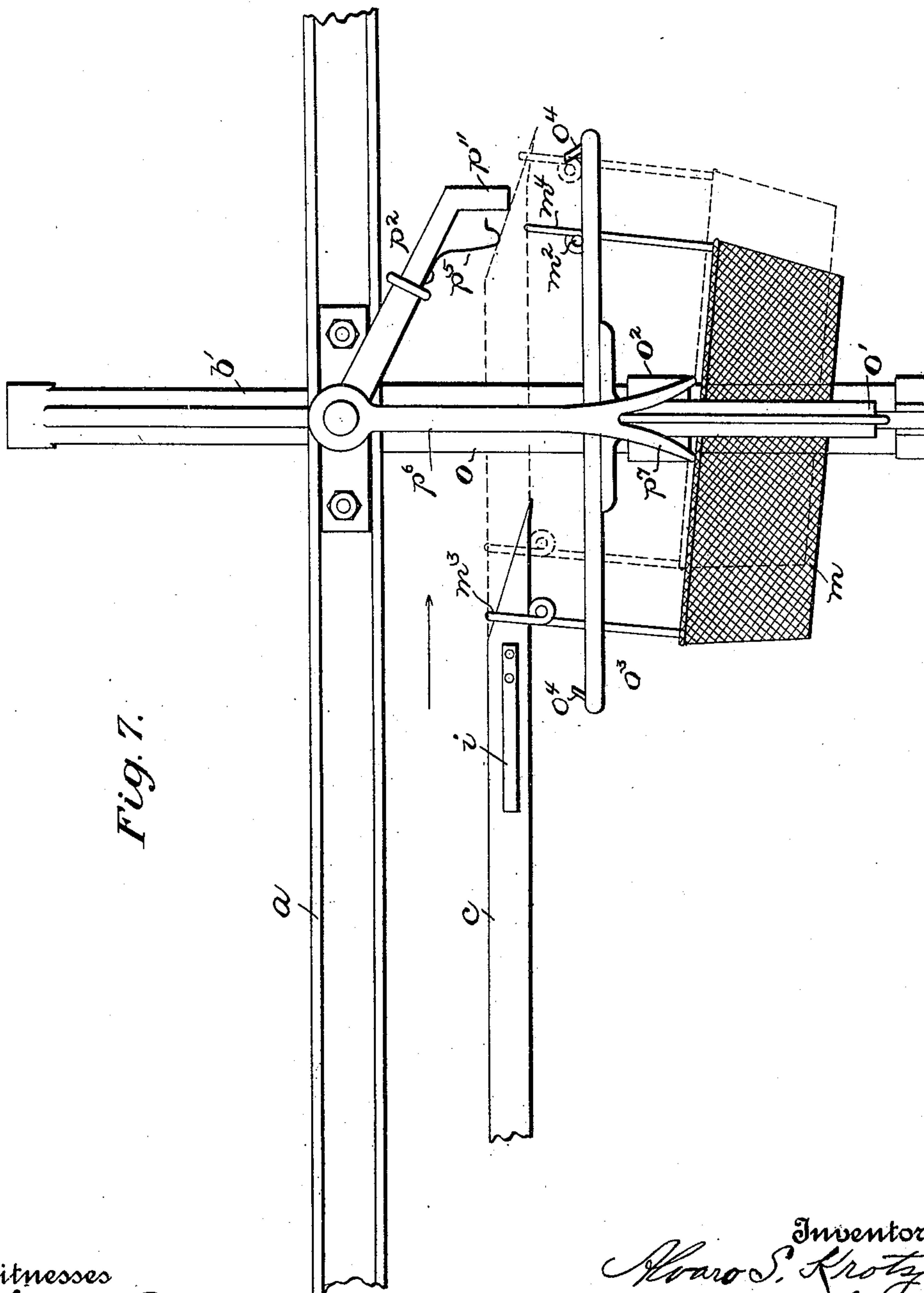


Fig. 7.

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Fig. 8.

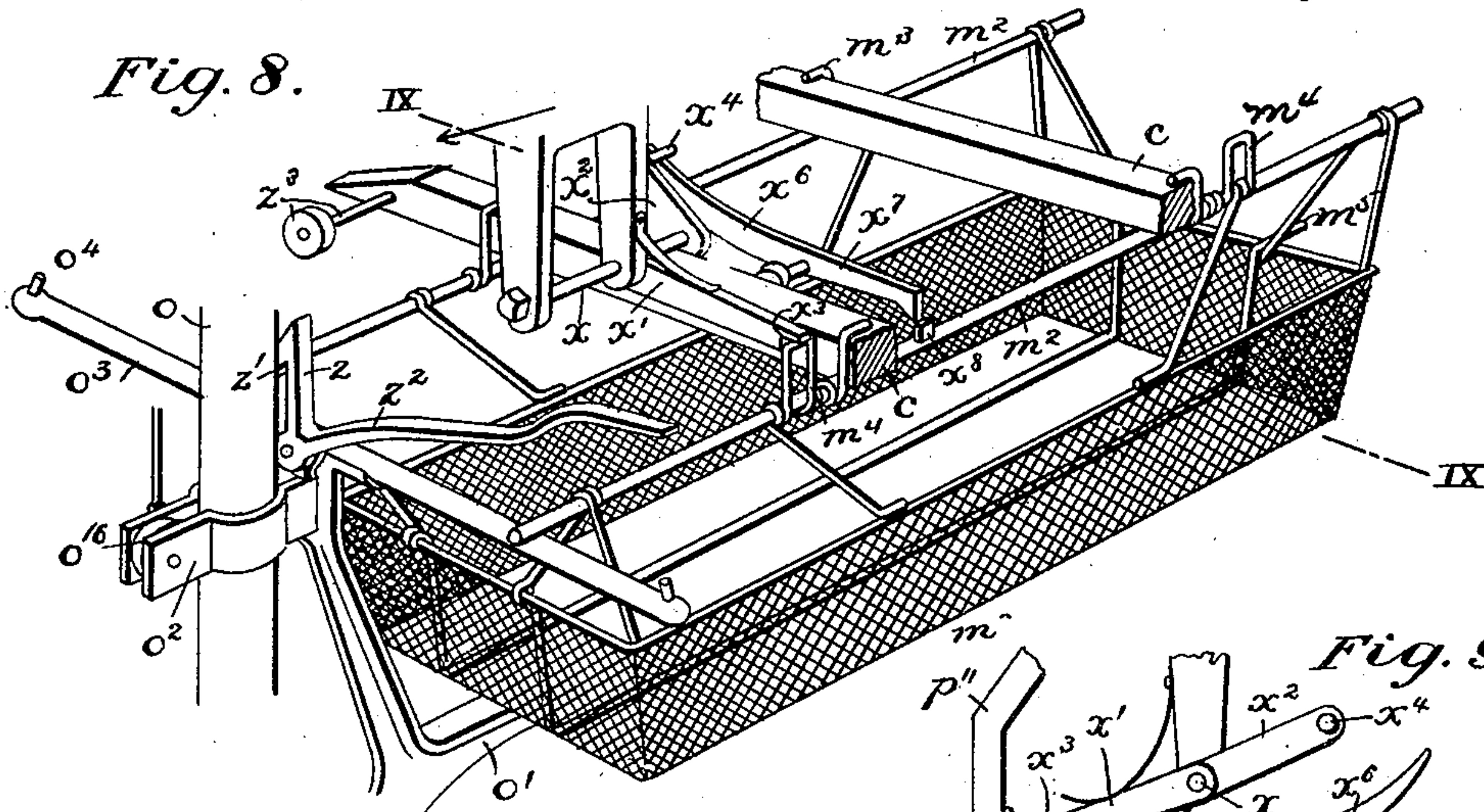


Fig. 9.

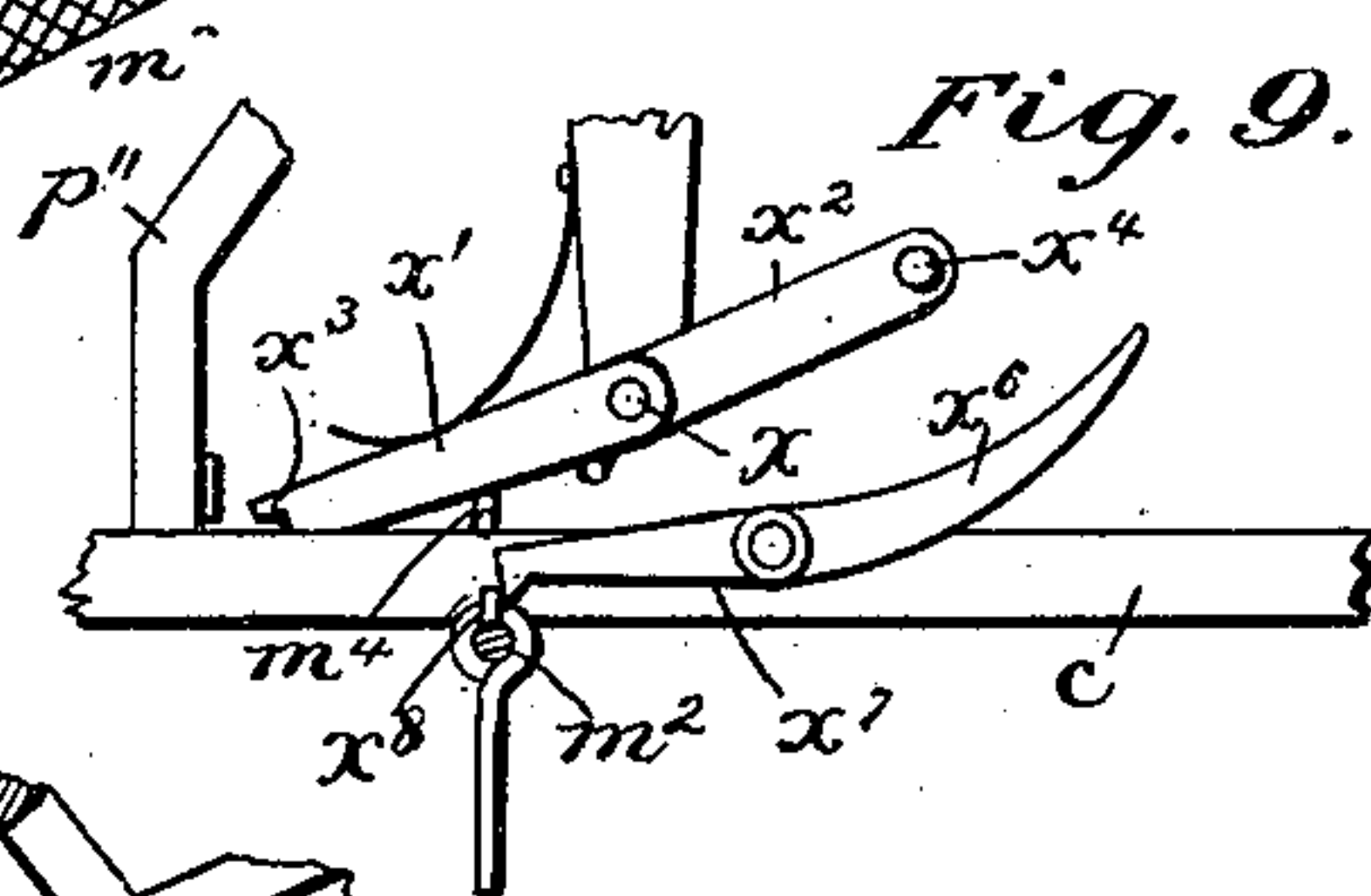


Fig. 10.

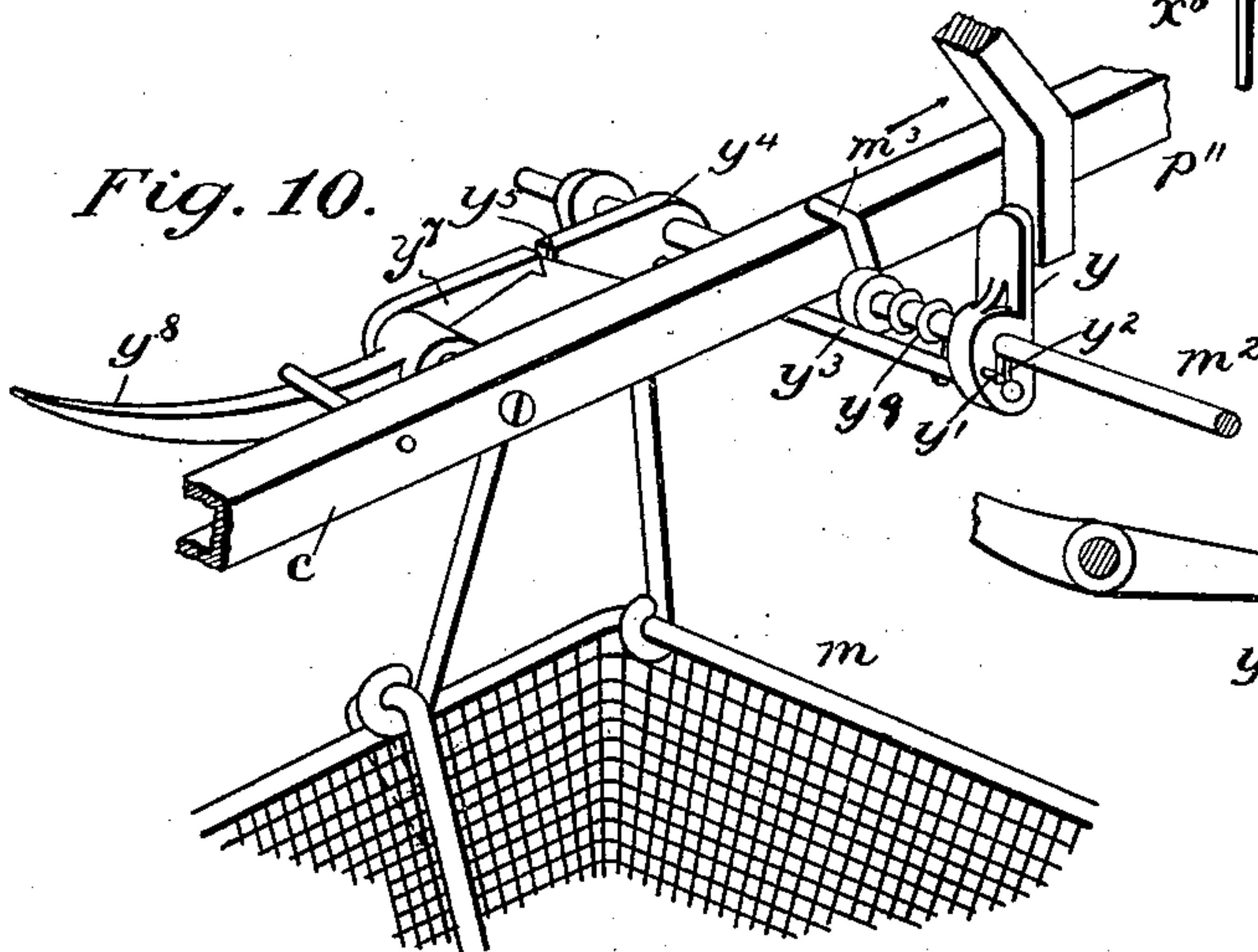


Fig. 11.

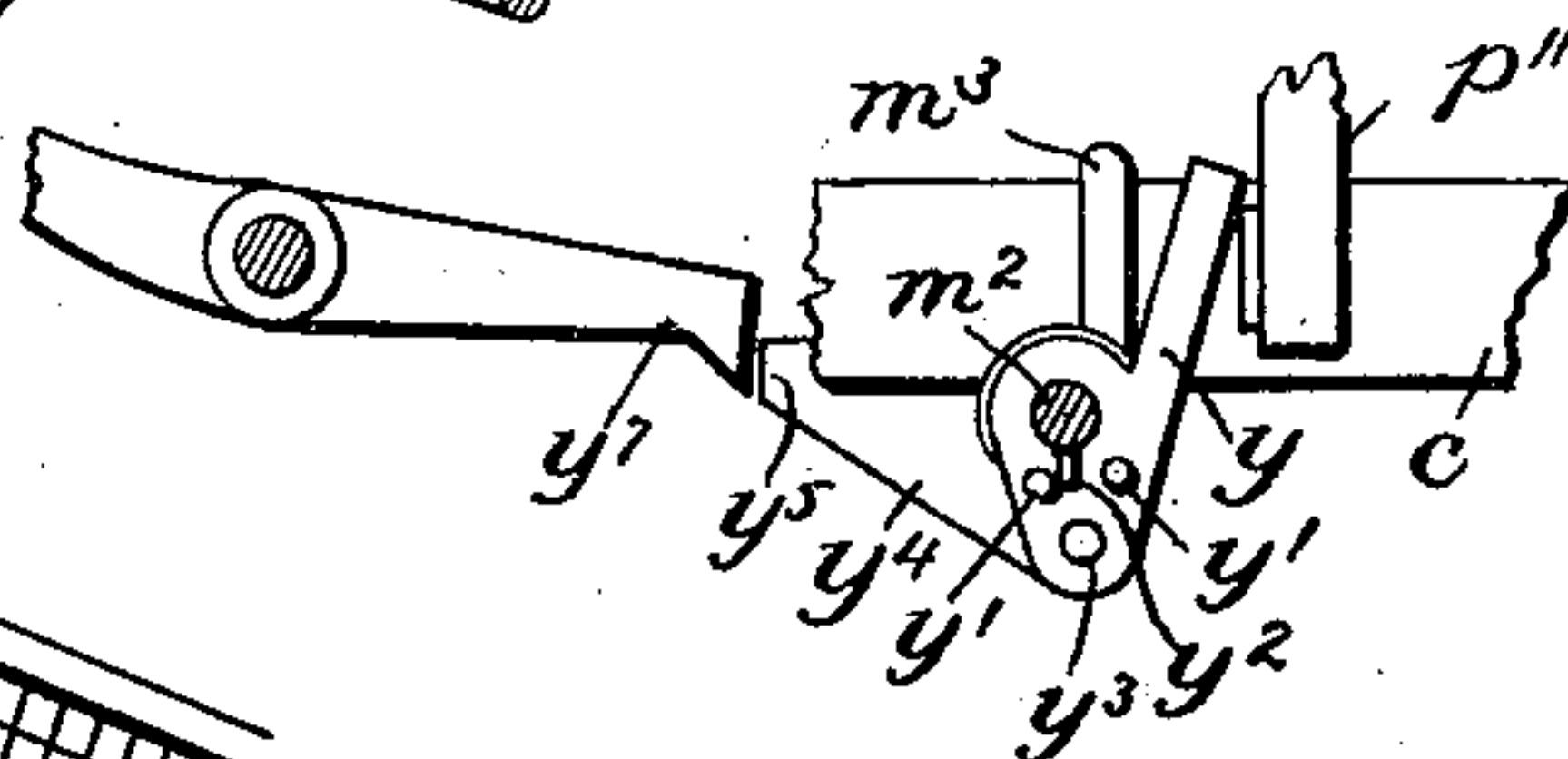


Fig. 12.

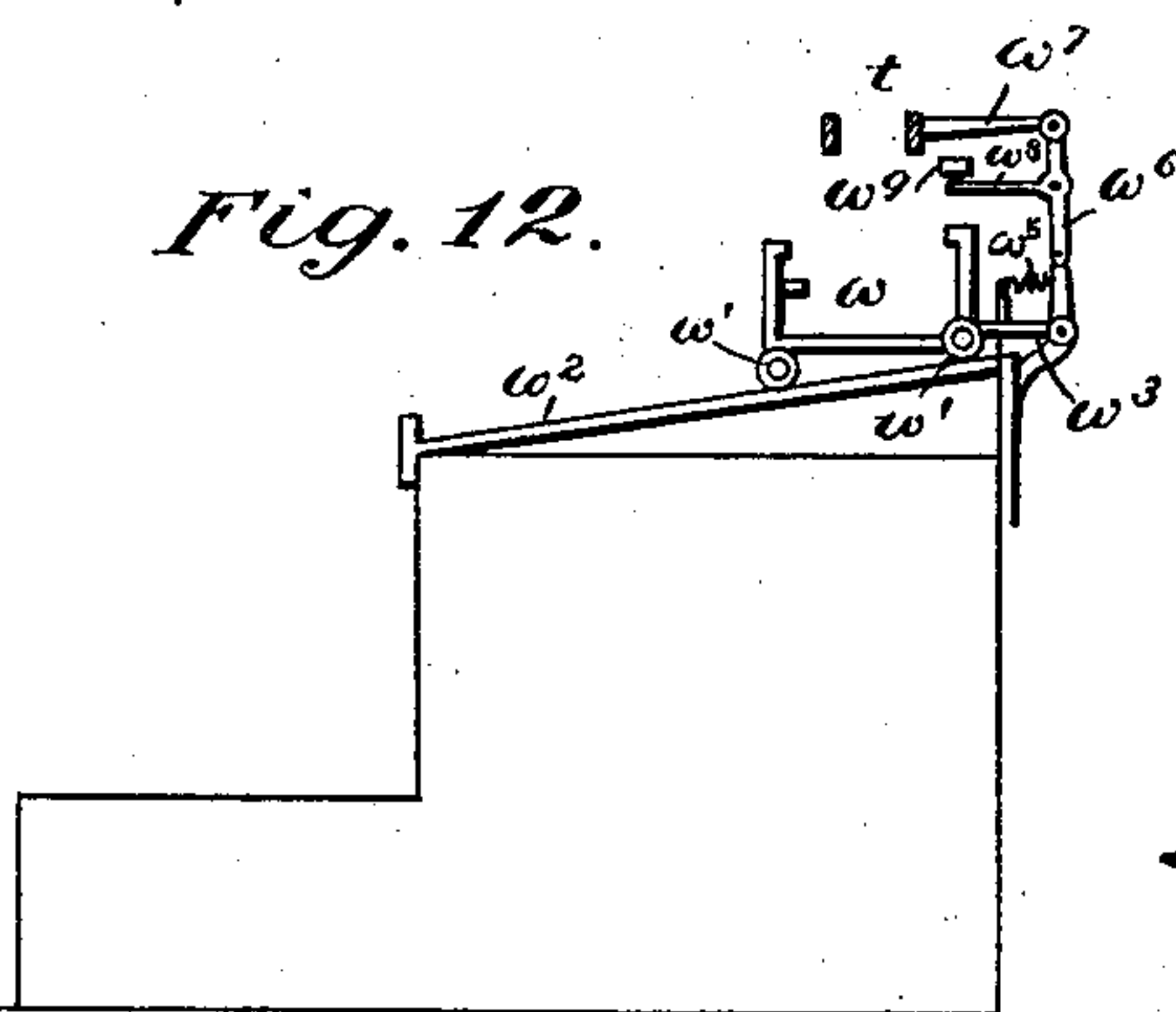
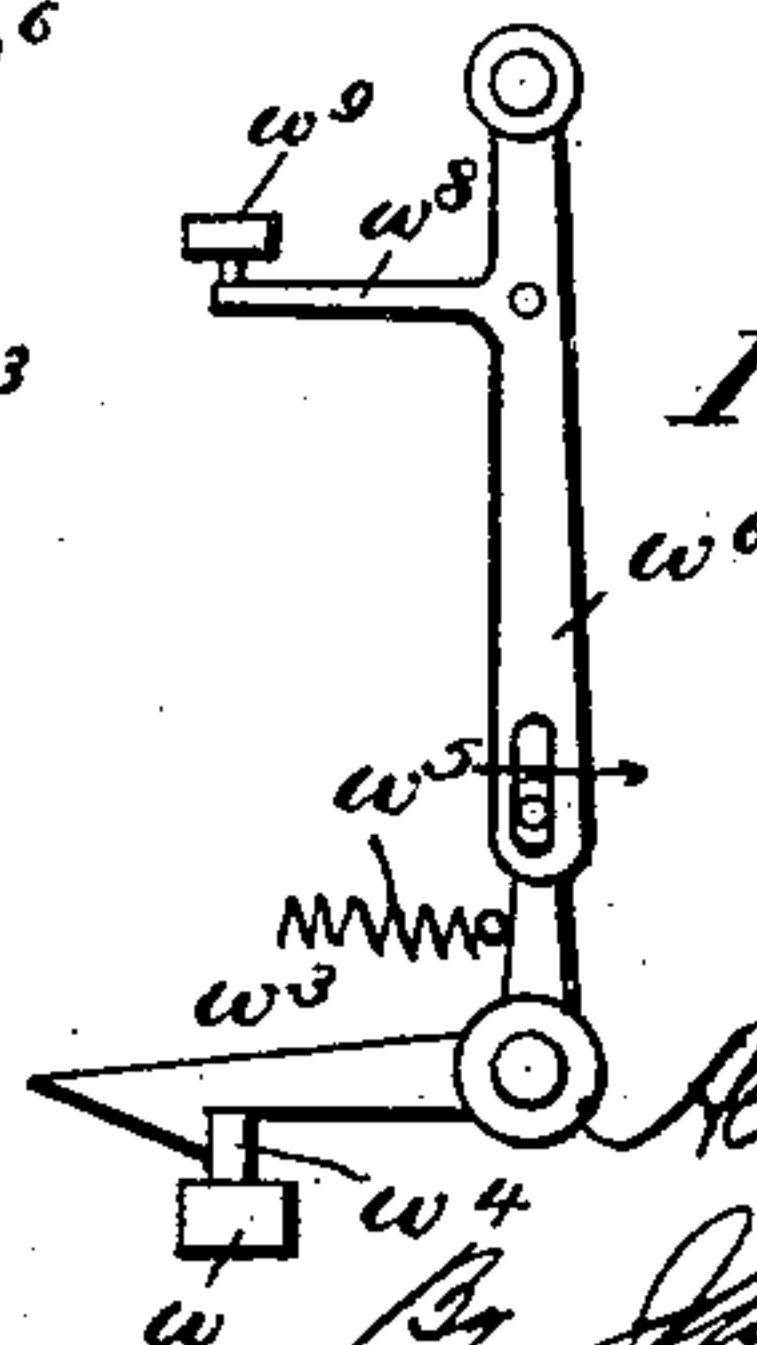


Fig. 13.



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UNITED STATES PATENT OFFICE.

ALVARO S. KROTZ, OF SPRINGFIELD, OHIO, ASSIGNOR TO OLIVER S. KELLY,
OF SAME PLACE.

CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 603,607, dated May 3, 1898.

Application filed February 5, 1898. Serial No. 669,231. (No model.)

To all whom it may concern:

Be it known that I, ALVARO S. KROTZ, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Conveying Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to conveying systems, and although capable of embodiment in a multitude of ways in various connections it is particularly adapted for use in store-service apparatus for conveying parcels from place to place, as from the counter where the salesman is located to the cashier's stand, where the goods are wrapped and change is made, the money for the goods being transmitted to the cashier's stand with the parcel.

I have said that the invention is particularly adapted for use in store-service apparatus because I have found this to be the case in actual practice, but I contemplate its employment in many other connections, and hence do not desire to limit myself in any way to the embodiment of the invention in any one form of apparatus or for any one particular purpose.

The invention is intended largely as an improvement upon certain prior constructions of store-service apparatus, and particularly those illustrated in Patents No. 544,002, dated August 6, 1895, and No. 578,939, dated March 16, 1897, both granted to H. M. Neer. These patents disclose the general idea of a store-service apparatus in which a conveyer or carriage is caused to traverse a track and to pick up receptacles, carriers, or baskets at various points or stations along the track and to leave such receptacles at their proper stations after having been delivered at a receiving-station and again picked up thereat, the transfer of the receptacles between the conveyer and the holders at the various stations being effected automatically by means of suitable stop and trip devices. These patents also disclose the idea of an elevator located at each salesman's station for supporting the receptacle, basket, or carrier and

raising and lowering the same, the lowering being effected automatically by gravity when a receptacle has been deposited in the elevator from the conveyer, the latter in passing operating trip mechanism to release the elevator. I am also aware that some years prior to the issuance of the said Neer patents there was disclosed in Patent No. 338,663, dated March 23, 1886, and granted to G. F. Green, the general idea of a store-service apparatus in which a carriage reciprocates on the track in contradistinction to its traveling round and round, as in the Neer apparatus, and a plurality of stations occur along the track, where receptacles are suspended when it is desired to have them picked up by the carriage, the latter being equipped for supporting and conveying any number of the receptacles to a receiving-station and there delivering the same, and also adapted to return the receptacles and deliver them at their respective stations after they have been replaced on the carriage at the receiving-station. In a still earlier patent, No. 338,224, dated March 16, 1886, and granted to said G. F. Green, there is disclosed the general idea of a car or carriage reciprocating upon a length of track and carrying a receptacle for parcels and cash, with provision for lowering the same to remove the parcel and cash or for other purposes either at the different stations where the salesmen may be located or at the receiving-station. With full knowledge of this prior state of the art I have in evolving the present invention endeavored to utilize elements of the apparatus shown in these prior patents, while avoiding certain objectionable features, and to so combine the useful and essential elements with certain new elements as to produce a thoroughly practical result.

While it is true I employ a number of elements which may be considered the equivalent of corresponding elements used in the constructions which are disclosed in the patents hereinbefore referred to, yet my invention differs essentially from the disclosures in these prior patents in novel combinations of parts whereby defects discovered in apparatus constructed in accordance with said prior patents are entirely obviated.

My invention involves novelty in the combination of parts whereby the receptacles are transferred between the conveyer and the holders at the various stations, absolute certainty being insured that the receptacles will be properly transferred without possibility of accident to any portion of the apparatus, and this is accomplished without undue complication of parts, and the number of parts is reduced to the minimum by so constructing and arranging them that their functions are multiplied.

While certain of the general features of the present invention are, as above stated, disclosed in prior patents, yet the evolution of the present invention is believed to make possible for the first time the practical application of those general features in a great variety of industries, opening up much broader fields for the utilization of an automatic conveying apparatus than could possibly have been contemplated by prior patentees. The form in which I have embodied the general features of a conveying system of the character shown in the prior patents mentioned will readily suggest their practical application in various other connections than for store-service—as, for example, in apparatus for conveying commodities from place to place in workshops and factories, in excavating and dredging operations, and, in fact, in any connection where a load is to be carried from place to place and deposited or discharged at a receiving-station. In the present application I have indicated only a limited number of modes in which the invention is capable of embodiment; but it will be understood that I do not propose to confine myself to a limited application of the invention, and therefore the appended claims, which recite what I consider its essential elements, are intended to cover the broad application of the invention in any connection where it is applicable.

The drawings which accompany and form part of this specification illustrate a number of forms of embodiment of the invention.

Of said drawings, Figure 1 represents a general perspective view of a complete apparatus. Fig. 2 represents the conveyer in perspective and detached. Fig. 3 represents the framework at the receiving-station in perspective. Fig. 4 represents an elevation of this framework, together with a portion of the track, and the conveyer as it appears in passing through the receiving-station. Fig. 5 represents a plan view of the same. Fig. 6 represents a perspective view of the fixture at one of the salesman's stations and its appurtenances, together with the elevator in its raised position. Fig. 7 represents a side elevation of the same parts, together with part of the conveyer and one of the baskets, illustrating the manner in which the latter is picked up by the conveyer. Fig. 8 represents in perspective a modified arrangement of stop and trip devices for effecting the automatic transfer of the basket between the conveyer

and the elevator. Fig. 9 represents a sectional elevation taken on line IX IX of Fig. 8 and looking in the direction of the arrow crossing this line. Fig. 10 represents in perspective another modification of these devices. Fig. 11 represents a fragmentary elevation of the same. Fig. 12 shows a modified form of receiving-station in side elevation. Fig. 13 is a detail of trip devices employed at this receiving-station.

The invention may be embodied in a system where the track is continuous, extending over the cashier's desk or over a suitable stand where wrapping is done or where change is made, the track thence extending on an incline at each side until the desired elevation is attained, and thence horizontally from the top of one inclined section to the top of the other. Such a system is illustrated in perspective in Fig. 1, and the letters *a* and *a'* designate, respectively, the outer and inner rails composing the track and angular in cross-section, as shown in Fig. 6, said rails being supported in any suitable manner—as, for example, by hangers suspended from the ceiling of the room in which the apparatus is erected. In the drawings, the letter *b* designates the stem of such a hanger, and *b'* a yoke secured to the lower end of the stem and to the track-rails, on the outer sides of the latter, with properly-interposed insulation.

The carriage or conveyer, which travels upon the above-described track and is intended to remain constantly thereon, is of the following description, reference being had more particularly to Fig. 2: It comprises a pair of rails *c*, each tapered at both ends on the upper sides, as shown at *c'*, and turned inwardly at one end and tapered on the outer side also, as shown at *c''*. The said rails are connected near their ends by cross-rods *c²* and at intermediate points by arches *c³* and *c⁴*, of skeleton construction, which constitute, respectively, the bases for a trailer and a motor-truck. The latter comprises a suitable frame *d*, having a pendent journal *d'* engaging a vertical bearing upon the arch *c⁴*, a shaft *d''*, journaled in suitable bearings on said frame and carrying within the latter an armature *d²* and outside the frame a pair of wheels *d³*, which run upon the track, the said wheels being preferably rubber-coated and their body portions being composed of hard fibrous material. Field-coils *d⁵* are supported at opposite sides of the armature in arms *d⁶*, projecting from the frame of the motor, and to one of said arms there is secured a cross-piece carrying curved spring-arms *d⁷*, which support brushes *d⁸*, the latter bearing against the inner surfaces of the track-rails. These brushes are suitably wired to the commutator, which is arranged at one side of the frame *d*, and the said commutator is suitably wired to the field-coils *d⁵*. The brushes *d⁸* conduct the electric current from the track-rails, and thence the current passes through the motor in a well-known manner to drive the wheels

d^3 and propel the carriage along the tracks in an obvious way. The lower forward arm d^6 of the motor-frame carries a bracket e , on the outer ends of the arms of which there is journaled a pair of rollers e' , which by contact with the inner surfaces of the track-rails properly guide the motor around the track, insulation being appropriately interposed to prevent these rollers acting as conductors of electricity to drive the motor. Further guiding means are provided in the form of blocks of insulation e^2 , secured to the sides of the motor-frame and shouldered so as to extend over the inner sides of the track-rails and also underneath the same to prevent the motor from jumping the track.

The trailer hereinbefore referred to comprises a frame f , having a pendent journal which engages a bearing f' , which in turn is journaled in the frame c^3 , the said journals being at right angles to each other with the object of compensating for irregularities in the track without causing the rails of the carriage to be appreciably affected. The trailer-frame f is formed with upright bearings for a shaft f^2 , which carries wheels f^3 to run upon the track-rails, these wheels being of corresponding construction to the wheels of the motor. Arms f^4 , which depend from the frame f at opposite sides of the same, carry blocks of insulation f^5 , shouldered to extend under the inner sides of the track-rails and also over the lower sides of the same to properly guide the trailer and also to prevent the same from jumping the track. Further guiding means are provided by rollers f^6 , journaled at the outer ends and on the under sides of arms f^7 , projecting from the front side of the frame f , the said rollers running along the inner sides of the track-rails.

It will be seen that a carriage or conveyer constructed as above described is calculated to run easily around the track without any possibility of binding thereon at any point, notwithstanding the fact that slight irregularities may exist, and, moreover, ample provision is made for preventing any possibility of the carriage becoming derailed.

The other equipments of the carriage or conveyer, which will next be described, have to do with its capability of handling the baskets or other carriers or receptacles—that is to say, taking up the same at various points and dropping them again at the cashier's stand and also returning them to and depositing them at their own stations. A shaft g is journaled in the carriage-rails c at the rear end of the latter, said shaft having affixed to its middle portion a hook-shaped arm g' , which when the shaft is in its normal position bears against the rear cross-rod c^2 , depending sufficiently below the same to act against a basket or carrier which may be resting upon the rails c . A spiral spring g^2 surrounds the said shaft and is secured at one end thereto, and at its opposite end is engaged with the cross-rod c^2 , the said spring pressing

the hook-shaped arm g' downwardly against said cross-rod. An arm g^3 , affixed to the said rock-shaft, projects upwardly therefrom and is equipped with a roller g^4 , which by coaction with certain cam-strips hereinafter described, one of which is located at the cashier's stand and others at the various stations, produces a sufficient elevation of the hook-shaped arm g' to remove it from position for engagement with a carrier or basket to permit the latter leaving the carriage.

In front of the motor gravity stop-pieces h are pivotally connected with the carriage-rails on the inner sides of the same, these stop-pieces having pins h' , which project into the inside grooves of the rails, so as to limit downward movement of the stop-pieces, the latter being for the purpose of preventing a holder or basket from moving off of the front end of the carriage. At this part of the carriage there are also provided spring-strips i , which are secured to the outer sides of the carriage-rails and project therefrom for coaction with the baskets or carriers in a manner which will be hereinafter explained. At the rear end of the carriage an arm j is rigidly fastened to one of the rails c and projects upwardly therefrom, being equipped with a roller j' , which coacts with parts (hereinafter described) at the different stations in connection with the delivery of the baskets or carriers.

On the inner sides of the rails c of the carriage there are fastened strips k , which project somewhat below the lower edges of the rails and are composed of suitable material, such as rubber, which will cause sufficient friction between the carriage and baskets or carriers to insure the latter's being properly lodged upon the carriage and the swiftly-moving carriage properly picking up the baskets or carriers.

The form of basket carrier or receptacle here shown comprises a body portion m , of any suitable form and construction, that here shown being composed of wire network and a suitable frame of metal rods and suspension-rods m' , which rise from the frame of the body portion and have rigidly connected with them rods m^2 , extending lengthwise of the basket at an elevation above the body of the same and projecting beyond the ends of the basket for the purpose of engagement with certain supports, hereinafter described, located at the various stations. On the rods m^2 there are rigidly fastened upstanding hooks m^3 , whose horizontal arms project toward each other and are adapted to engage the upper sides of the rails c of the carriage, whereby the basket or holder is suspended from and carried by the carriage. There are also rigidly affixed to one of the rods m^2 upstanding projections m^4 , (see Fig. 8,) designed for coaction with certain abutments located at the particular station where the basket belongs, as will be more fully explained hereinafter. The basket is provided at one end with

outwardly-projecting lugs or pins m^5 for engagement with a portion of the framework at the cashier's stand, which framework will next be described. It comprises a suitable number of U-shaped uprights n , (see Fig. 3,) a back rail n' at a suitable elevation to properly receive the projecting ends of the rods m^2 of the baskets when the latter are brought to the cashier's stand by the carriage, a front rail n^2 , considerably lower than the back rail n' , so as to permit the baskets being taken out and replaced readily, said front rail providing a resting-place for the pins or lugs m^5 on the baskets, and a supplemental front rail n^3 at the same height as the back rail n' and affording a support for the projecting ends of the rods m^2 of the baskets when the latter are put in position to be taken by the carriage and conveyed away from the cashier's stand. At about the middle of the framework on the cashier's stand—that is to say, where the upper and lower front rails n^3 and n^2 overlap, as shown in the drawings—there is arranged a stop mechanism for effecting the delivery of the baskets when brought to the cashier's stand from the various stations. This stop mechanism comprises the following parts: In suitable guides on the outer sides of the back rail n' and the front rail n^3 there are arranged to slide vertically a pair of strips n^4 and n^5 , which normally project above the said rails in the path of the projecting ends of the basket-rods m^2 , so that the latter will encounter said stop-pieces and be prevented thereby from being carried on by the carriage. Said strips or stop-pieces are connected with a rock-shaft n^6 by means of arms n^7 and n^8 , affixed to said rock-shaft and pivotally connected with the strips, respectively. Said arm n^8 is equipped with a suitable handle n^9 , and is connected by a spiral spring n^{12} with one of the uprights of the framework. This spring holds the stop-pieces or strips normally projected above the rails n' and n^3 ; but by means of the handle n^9 the stop-pieces or strips may be lowered to permit passage of the basket beyond the same, so as to rest upon the rails n' and n^3 in position to be taken by the carriage.

When a basket is brought into the receiving-station, its front rod m^2 abuts the strips n^4 and n^5 , as shown in Fig. 4, and the carriage passes on through, the basket dropping upon the rails n' and n^2 when disengaged from the carriage. In order to have the basket taken away by the carriage the stop-pieces n^4 and n^5 are lowered and the basket is pushed along beyond the same where it can be picked up, as also shown in Fig. 4, and conveyed away.

Of course when one or more baskets have already been deposited in the receiving-station the next basket brought in will not come against the strips n^4 and n^5 , but against the basket in front of it. The upward movement of the strips is limited by a projection n'' on one of them coming against the under side of the guide on the rail n^3 .

Extending along just under the outside track-rail a , where the latter runs above the cashier's stand, there is a strip g^5 , secured to the said track-rail by means of suitable brackets and positioned to coact with the roller g^4 , hereinbefore described, as part of the carriage equipment. The said strip g^5 has an upturned end portion g^7 , and when the carriage runs into the framework on the cashier's stand the roller g^4 , by coaction with the said upturned end of the strip g^5 , causes a rocking of the shaft g sufficient to elevate the hook g' above the plane of the basket-rods m^2 , so that the carriage can pass on through the framework on the cashier's stand, while the baskets are left in the latter by reason of their abutment against the stops n^4 and n^5 . The strip g^5 is of sufficient length to hold the hook g' elevated long enough to insure the complete disengagement of the carriage from the basket or holders.

At each of the stations where the baskets are picked up by the carriage there is erected a tubular standard o , (see Fig. 6,) which projects above the track and constitutes a guide for a vertically-movable basket holder or elevator comprising a U-shaped frame o' , having suitable clips o^2 , loosely embracing the said standard, and longitudinal rods o^3 , fixedly mounted upon the uprights of the U-shaped frame and constituting supports for the basket, the projecting end portions of whose rods m^2 are adapted to rest upon the said rods o^3 and the latter being provided with upstanding pins o^4 near their ends to prevent the accidental removal of the basket. The basket holder or elevator is counterbalanced by a weight o^5 , suspended within the tubular standard by means of a cord o^6 , which runs over a pulley o^7 , mounted in bearings on the upper end of the standard, the said cord depending on the outer side of the standard and suitably connected with the elevator. Suitable means are provided for raising the elevator, those here shown comprising a cord o^8 , attached at one end to one of the clips o^2 and passing upwardly and over a pulley o^9 on the standard, at the upper part of the same, the said cord depending a suitable distance for manipulation and being equipped with a suitable handle, knob, or button. The weight o^5 exactly counterbalances the elevator, so that the latter will remain in any position to which it is brought; but when a basket or holder is deposited in the elevator the counterbalancing-weight is overcome, so that the elevator lowers, and to prevent shock in the lowering of the elevator with the basket any suitable cushioning means may be provided. That here shown comprises a cylinder o'' , a piston-rod o^{12} , having a piston on one end closely fitting the interior of the cylinder and a head o^{13} on the upper end, and a spiral spring o^{14} , surrounding the piston-rod and bearing at one end against the cylinder and at the other against the head o^{13} . When the elevator lowers, a flattened projection or foot o^{15} , formed

upon the frame o' , encounters the head o^{13} , and a cushioning effect is produced in an obvious manner.

To secure easy running of the elevator up and down the standard, rollers o^{16} are journaled in the clips o^2 and have concaved peripheries to engage the surface of the standard on opposite sides of the same. Suitable means are also provided, such as a slot in the standard and a projection on one of the elevator-clips, to prevent turning of the elevator.

The standard o is fixedly connected at its upper end with one of the hangers b' by means of a rod or shaft p , and a corresponding shaft p' projects from the opposite side of the said hanger, and these shafts constitute supports for adjustable stop devices in the form of arms p^2 , having bosses p^3 , which embrace the rods and are adjustably secured to the same by means of set-screws p^4 . The arms p^2 project forward and downwardly from the shafts or rods, and at their ends have downturned portions p'' , against which the projections m^4 on the basket abut when the latter is delivered by the carriage. To prevent a rebound of the basket or carrier when such abutment takes place, guard-springs p^5 are fastened to the under sides of the arms p^2 , said springs being curved in a manner to permit of their ready displacement by the basket projections, but turned upwardly at their ends, so as to form shoulders extending substantially parallel with the downturned end portions of the arms p^2 , and hence preventing a rebound of the basket after striking the downturned ends p'' . The stop-arms p^2 are adjusted differently at the different stations, so that they will stand in the path of the projections on that basket which belongs at the station where these stop-arms are located. The rod or shaft p' carries at its outer end a pendent arm p^6 , having a bifurcated lower end p^7 , constituting a guide for the elevator, which is suitably formed at its outer side for engagement with the bifurcation of said pendent arm. A strip g^8 extends along below the outer track-rail a and on either side of the hanger b' , said strip being supported by brackets g^9 , fastened to the said track-rail, and being formed at one end with an upturned or inclined portion g'' , positioned for coaction with the roller g^4 on the carriage for a similar purpose to that hereinbefore described in connection with the delivery of the baskets at the cashier's stand—namely, to elevate the hook g' so that it will clear the basket when the same is to be delivered at the station.

When the elevator with its basket is raised to bring the basket in position to be taken by the carriage, it is held in that position by means of a hook j^2 , pivotally connected at its upper end with the standard o and depending for engagement with a pin j^3 on one of the clips of the elevator-frame, the said hook being inclined on its under edge and spring-actuated for the purpose of automatic engagement with the pin. The said pendent hook

is connected by a link j^4 with one end of a horizontally-disposed lever j^5 , which is pivoted to an arm j^6 , depending from and fixedly attached to the shaft or rod p , and said lever on the front side of its pivot is curved inwardly, as shown at j^7 , so as to extend in the path of the roller j' on the carriage, whereby the hook j may be displaced as the carriage passes and the automatic lowering of the elevator with its basket thereby effected. A spiral spring j^8 , which is connected at one end with the standard o and at the other end with the lever j^5 , exerts itself to restore the parts to their normal positions, as illustrated in Fig. 6.

In the operation of the apparatus the carriage traveling around on the track will pick up any one of the baskets or holders which may have been raised at any one of the stations. When so raised, the basket assumes a position with its upstanding hooks m^3 so located that the rails c of the carriage will pass through said hooks, but the horizontal arms of said hooks are not in as high a plane as the upper sides of the carriage-rails, and the basket is elevated by the action of the inclined upper sides c' of the carriage-rails acting against the under sides of the horizontal arms of the hooks, as shown in Fig. 7. The basket is not raised far enough by the elevator to bring its projections m^4 into line with the stops p'' , and it is evident that before the basket is raised by the carriage the said stops m^4 must be beyond the stops p'' ; otherwise the basket could not be carried on by the carriage. Sufficient friction may be engendered between the carriage-rails and the basket-hooks which are first encountered to move the basket forward far enough to carry its projections m^4 beyond the stops p'' ; but to insure this result the springs i are provided on the sides of the carriage-rails for pressure against the upright portions of the hooks m^3 first encountered, so that the basket will not only be tipped up at its rear side, but will be carried forward before it is bodily elevated. Of course the basket may be in such a position on the elevator that this last-described operation is not necessary; but, again, it is liable to rest upon the rods o^3 of the elevator in such a position that the projections m^4 on the carriage will come behind the stops p'' , and hence the provisions above described for insuring conveying away of the basket by the carriage. It will be understood that as the carriage comes into the station the roller g^4 on the carriage encounters the inclined end of the strip g^8 , and it is thereby depressed so that the hook g' will be elevated and can pass over a basket which is to be delivered at the station. A basket which is not to be delivered at the station will be carried on through, as it will encounter no stops at the station. As the carriage leaves the station its roller j' acts against the curved portion j^7 of the lever j^5 , and through the connections hereinbefore described the hook j^2 is tripped, so that

a basket delivered at the station will be immediately lowered to its normal position.

When a basket has been taken from one of the stations in the manner above described, it is conveyed to the cashier's stand, where the carriage runs into the framework and carries the basket against the stops n^4 and n^5 and passes on, leaving the basket in the frame. When the basket is to be carried from the cashier's stand back to its station, stops n^4 and n^5 are lowered by means of the handle n^9 and the basket is moved beyond the said stops, which are again projected above the rails n' and n^3 . When the carriage comes around again, it will take up the basket thus moved beyond the stops n^4 and n^5 in the same manner as it picked up the basket at the station, and it will then carry the basket to its own station and there deposit it. Suitable stop-pins n^{10} project from the rails n' and n^3 to prevent the basket from being carried off the same without having been properly engaged with the carriage.

It will be seen that the operation of such an apparatus as above described may proceed automatically so far as the transferring of the baskets between the carriage and the holders at the various stations and the propulsion of the carriage is concerned, it being only necessary for the operators to put the baskets in positions to be taken up by the carriage in passing, and even this can be effected automatically, if desirable, as hereinafter explained. It is to be noted that the transfer devices are constructed and arranged with a view to certainty of operation and durability. It may be here stated that wherever there is a direct impact abutting parts will be faced with wear-proof and sound-deadening material.

Possibility of derangement of the apparatus is very slight, for the manipulations which attendants are called upon to perform are of the simplest nature, and mistakes calculated to cause accidents to the apparatus are hardly possible.

Modifications in the details of construction of the stop and trip devices whereby the receptacles are transferred between the carriage and the holders at the different stations are illustrated in Figs. 8, 9, 10, and 11.

In the construction hereinbefore described the catch on the carriage—namely, the hook-shaped arm g' —is elevated from position for engagement with the baskets at each and every station whether or not a basket is to be left at any station. In the modification shown in Figs. 8 and 9 a construction is illustrated which provides for the displacement of the catch on the carriage only when a basket is to be delivered at one of the stations. This arrangement comprises a lever consisting of a rock-shaft x , journaled in bearings on the hanger b' and having affixed to it arms x' and x^2 , projecting in opposite directions, the former being shouldered at its outer end on the under side, as shown at x^3 , and the latter

being provided with a laterally-projecting pin x^4 at its extremity. The arm x' constitutes an abutment standing normally with its lower edge inclined downwardly in the direction of the travel of the carriage, as shown in Fig. 9, and the projection or abutment m^4 on the basket which is to be delivered at its station encounters the said arm and, by acting against its inclined lower edge, elevates the arm, and consequently lowers the arm x^2 . The object of the shoulder x^3 is to prevent a rebound of the basket after it has encountered the fixed abutment p'' . The catch on the carriage is in the form of a lever comprising a curved arm x^6 , extending into the horizontal plane of the pin x^4 when lowered as described, so that the said arm x^6 will encounter the said pin x^4 and be depressed thereby, and comprising an arm x^7 , formed at its front end for engagement with a projection x^8 on one of the rods of the basket. Normally the said arm x^7 occupies a position where it will engage the projection x^8 and prevent the basket leaving the carriage, as clearly shown in Fig. 9; but when the basket is to be delivered at a station and the basket projection or abutment m^4 has acted upon the arm x' in the manner hereinbefore described the consequent depression of the arm x^2 results in the arm x^7 being elevated so as to clear the projection x^8 by reason of the depression of the arm x^6 by its encounter with the pin x^4 . It will be seen that by the above-described construction it is only when the projection on the basket encounters the arm x' at its own station that the catch on the carriage is displaced.

The further modification shown in Figs. 10 and 11 illustrates a construction wherein the catch on the carriage is not displaced at all, except at the receiving-station. To effect this, the stop projection or abutment on the basket is not affixed thereto, but is in the form of an arm y , pivotally mounted upon the rod m^2 of the basket, so as to have a rocking movement thereon, limited by the abutment of pins y' , fastened in the said arm, against a projection y^2 on the said rod. This arm y is connected on the lower side of the rod m^2 by a supplemental rod y^3 with another arm or catch y^4 , pivotally mounted upon the rod m^2 and formed with a rearward shoulder y^5 , which constitutes the abutment for the carriage-catch to act against. This catch is constructed substantially as shown in Fig. 10, the same comprising a lever composed of arms y^7 and y^8 . A spiral spring y^9 , mounted on the rod m^2 and fastened at one end thereto and engaged at the other end with the rod y^3 , exerts itself to hold the upstanding arm y in a forward position for engagement with the abutment p'' at the station where the basket belongs. It will be seen that normally the arm y^7 of the carriage-catch extends behind the shoulder y^5 and prevents removal of the basket from the carriage; but when the basket is to be delivered at its station the arm y encounters the abutment, and there-

fore the shoulder y^5 is depressed below the arm y^7 by reason of the pivotal movement of the arm y and parts connected therewith. Then the catch-arm y^7 on the carriage can pass
 5 freely above the arm y^4 , leaving the basket at its station.

It will be seen that in each of the above-described modifications there are coacting catches on the conveyer or carriage and the
 10 carrier whereby the latter is kept on the carriage and that one of these catches is adapted to be displaced when the carrier is taken into its station. In the construction shown in Figs. 8 and 9 the catch on the conveyer in
 15 the form of a lever x^6 x^7 is the one displaced, whereas in the construction shown in Figs. 10 and 11 the catch on the carrier in the form of an arm y^4 is the one displaced. Again, in each modification above referred to there is
 20 an abutment on the carrier and one at the latter's station, and one of such abutments is displaced by the encounter between them resulting from the incoming of the carrier. In the construction shown in Figs. 8 and 9
 25 the abutment displaced is the one located at the station and in the form of a pivoted arm x' , whereas in the construction shown in Figs. 10 and 11 the abutment displaced is on the carrier and in the form of a pivoted arm y .
 30 Furthermore, in each of said modified constructions the movable abutment coacts with the movable catch, so that the latter is displaced as a result of the encounter between the abutments. In the construction shown
 35 in Figs. 8 and 9, the movable abutment x' being at the station and the movable catch x^7 on the conveyer, they cannot of course be connected together, whereas in the construction shown in Figs. 10 and 11, the movable abut-
 40 ment y and the movable catch y^4 being both mounted on the carrier, they can be and are connected together. However, in each case these two movable parts coact so that displacement of the abutment results in displacement of the catch.
 45

In Fig. 8 a slightly-modified construction for holding the elevator in its uppermost position is illustrated, the same comprising a
 50 hook z , pivotally mounted on the elevator and adapted to engage a projection or pin z' , affixed upon the standard, and an arm z^2 , extending at an angle to the hook z and fixedly connected therewith, the said arm z^2 being
 55 formed for coaction with a suitable projection on the carriage, as the roller-equipped arm z^3 , so that as the latter leaves the station it will depress the arm z^2 and disengage the hook z from the pin z' .

A modification in the apparatus at the receiving-station is illustrated in Figs. 12 and
 60 13. The frame w , which receives the carriers from the carriage, is mounted on rollers w' , which run on an inclined track w^2 , extending from front to rear of the cashier's stand. Said frame is maintained in a position directly under the track by means of a latch

w^3 , (shown in detail in Fig. 13,) which is beveled at its outer end, so that when the frame is pushed forward a projection w^4 thereon will displace the latch against the stress of a
 70 spring w^5 , causing the catch at the end of the latch to move behind said projection w^4 as soon as the latter has passed the catch. The spring w^5 is of the spiral variety and is connected at one end with one arm of the latch
 75 and at the other end with any suitable stationary support, and this arm of the said latch is coupled by a slot-and-pin connection with a pendent lever w^6 , pivoted to a suitable overhead support w^7 , which may be an arm pro-
 80 jecting from one track-rail, and said lever w^6 carries an arm w^8 , projecting toward the track and equipped with a roller w^9 , against which a suitable projection on the carriage acts, so that when a receptacle has been deposited in
 85 the frame the latter is released and moves by gravity down its track to the lower side of the cashier's stand. When receptacles are to be taken from the frame, the cashier moves the same up the inclined rails to a position below
 90 the track, where it is held by the latch hereinbefore described.

It is evident that the receptacles instead of being carried to and delivered at a common receiving-station, as in the previously-
 95 described forms of apparatus, may be delivered at corresponding stations to their own and simply transferred between two or more corresponding stations. Such an apparatus would be adapted for use in establishments
 100 where goods or commodities are carried from one room to another or from one part of the building to another for any purpose. The track arrangement in such system may be
 105 such as to provide for either round and round traverse of the car or a reciprocal traverse thereof.

It will be readily understood that the appliances hereinbefore described in detail in
 110 connection with the parcel-carrier system are equally applicable in such a system as now indicated.

While I have shown in the drawings a track composed of two rails, it is evident that numerous modifications in this respect may be
 115 resorted to, for the carriage or carriages might be run upon a track composed of wire stretched between suitable points, as in many cash-carrier and other systems now in use, and one or more stretches of such wire or cable or other form of track may be used in
 120 carrying out my invention, it not being essential that the car shall run upon two cables or rails.

In the following claims the essential features of the invention are recited, and these claims are intended to embrace the embodiment of the invention in any kind of a conveying system where it is applicable.

Having thus fully described my invention,
 130 what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a conveying apparatus, the combination with a track or way, a conveyer on said track, and propelling means; of an abutment, a carrier adapted to lodge on said conveyer 5 in position to encounter said abutment, a holder for said carrier adapted to support the same in a position different from that it occupies on the conveyer, the latter and the carrier having provisions for engagement when 10 the carrier is thus lodged in the holder, to shift the carrier clear of the abutment as it is transferred to the conveyer.

2. In a conveying apparatus, the combination with a track or way, a conveyer on said 15 track, and propelling means; of a pendent abutment, a carrier adapted to lodge in said conveyer in position to encounter said abutment, a holder for said carrier adapted to support the same in a position lower than 20 that it occupies on the conveyer, the latter and the carrier having provisions for engagement when the carrier is thus lodged in the holder, to move the carrier beyond the abutment as it is transferred to the conveyer.

25 3. In a conveying apparatus, the combination with a track or way, a conveyer on said track, and propelling means; of an abutment, a carrier adapted to lodge on said conveyer in position to encounter said abutment, a holder 30 for said carrier adapted to support the same in a position different from that it occupies on the conveyer, said holder having an elongated rest for the carrier and suitable stops, and the conveyer and the carrier having pro- 35 visions for engagement when the carrier is thus lodged in the holder, to shift the carrier clear of the abutment as it is transferred to the conveyer.

4. In a conveying apparatus, the combination with a track or way, a conveyer on said 40 track, and propelling means; of a pendent abutment, a carrier adapted to lodge in said conveyer in position to encounter said abutment, a holder for said carrier adapted to support the same in a lower position than it occupies on the conveyer, said holder having an 45 elongated rest for the carrier and suitable stops, and the conveyer and the carrier having provisions for engagement when the carrier is thus lodged in the holder, to move the carrier on its rest beyond the abutment as it is transferred to the conveyer, substantially as described. 50

5. In a conveying apparatus, the combination with a track, a conveyer thereon, and 55 propelling means; of one or more pendent abutments, a carrier adapted to lodge on the conveyer in position to encounter said abutments, the carrier having a plurality of projections at opposite sides, and a holder for 60 said carrier having elongated rests or ways for the said projections of the carrier to lodge upon, the holder adapted to support the carrier in a lower position than it occupies in the 65 conveyer and the latter and the carrier having provision for engagement to advance the carrier on the ways of the holder to clear the

abutments in transferring the carrier to the conveyer.

6. In a conveying apparatus, the combination 70 with a track, a conveyer thereon, and propelling means; of one or more pendent abutments, a carrier adapted to lodge on the conveyer in position to encounter said abutments, a carrier having a plurality of projec- 75 tions at opposite sides, and an elevator for holding said carrier in position to be taken by the conveyer, but in a lower position than the carrier occupies on the conveyer, the latter and the carrier having provisions for engage- 80 ment to advance the carrier clear of the abutments in its transfer to the conveyer from the elevator.

7. In a conveying apparatus, the combination of a suitable track or way, a conveyer 85 traveling thereon and having a carrier-rail with a beveled end, a carrier adapted to lodge on said rail, an abutment for said carrier to encounter when on the conveyer, and a holder between which and the latter the carrier is 90 transferred, said holder adapted to support the carrier in a different position than it occupies on the conveyer, the beveled end of the carrier-rail of the latter operating to shift the carrier from such different position, and 95 sufficient friction being engendered between the conveyer and the carrier to cause the latter to be carried beyond the abutment before it is shifted into line with the same.

8. In a conveying apparatus, the combination 100 of a suitable track or way, a conveyer traveling thereon and having a carrier-rail with a beveled upper side at one end, a carrier adapted to lodge on said rail, a pendent abutment for the carrier to encounter when 105 on the conveyer, and a holder between which and the latter the carrier is transferred, said holder adapted to support the carrier in a lower position than it occupies on the conveyer, the beveled upper side of the carrier- 110 rail of the latter operating to lift the carrier from such lower position, and sufficient friction being engendered between the conveyer and the carrier to cause the latter to be carried beyond the abutment before being lifted 115 into line therewith.

9. In a conveying apparatus, the combination of a suitable track or way, a conveyer 120 traveling thereon and having carrier-rails with beveled upper edges at the forward end, a carrier having front and rear hooks to take over said rails and also one or more stop projections, one or more pendent abutments for the latter to encounter when the carrier is on the conveyer, and a holder having elongated 125 rests upon which the carrier drops when disengaged from the conveyer, said rests having stop projections beyond the pendent abutments and the carrier adapted to be slid forward on said rests and against said stop pro- 130 jections by the engagement of the carrier-rails of the conveyer with the rear hooks of the carrier, the beveled upper sides of the said rails operating to lift the carrier and

bring its stop projections into line with the pendent abutments beyond the same, substantially as described.

10. In a conveying apparatus, the combination of a suitable track or way, a conveyer traveling thereon and having carrier-rails with beveled upper edges at the forward end, and outstanding spring-strips on the sides, a carrier having front and rear hooks to take over said rails and also one or more stop projections, one or more pendent abutments for the latter to encounter when the carrier is on the conveyer, and a holder having elongated rests upon which the carrier drops when disengaged from the conveyer, said rests having stop projections beyond the pendent abutments and the carrier adapted to be slid forward on said rests and against said stop projections by the engagement of the spring-strips on the carrier-rails of the conveyer with the rear hooks of the carrier, the beveled upper sides of the said rails operating to lift the carrier and bring its stop projections into line with the pendent abutments beyond the same, substantially as described.

11. In a conveying apparatus of the character described, a conveyer or carriage comprising rails to engage and support the carriers, frames extending between said rails, a forward truck horizontally swiveled to one of said frames, and a trailer-truck horizontally and vertically swiveled to the other of said frames.

12. In a conveying apparatus, the combination with a suitable track or way, a conveyer thereon, and means for propelling the conveyer along the track; of guide-rails at a receiving-station, movable manipulative stop mechanism intermediate the ends of said guide-rails, and a carrier adapted to lodge in and be carried by the conveyer or to lodge on the guide-rails at the receiving-station by coming against an abutment or abutments presented by the said stop mechanism.

13. In a conveying apparatus, the combination with a suitable track or way, a conveyer thereon, and means for propelling the conveyer along the track; of horizontal guide-rails at a receiving-station, vertically-movable spring-sustained stop-pieces adjacent said rails intermediate the ends thereof, means for depressing said stop-pieces, and a carrier adapted to lodge on and be carried by the conveyer or to lodge on the guide-rails at the receiving-station by coming against an abutment or abutments presented by the said stop mechanism.

14. In a conveying apparatus, the combination with the track, the conveyer traveling thereon, propelling means, and a carrier having means of engagement with the conveyer and also lateral projections; of front and rear rails at a receiving-station adapted to support the carrier by the lateral projections thereon, one of said rails being in a lower plane than the other to facilitate removal of the goods from the carrier, and devices, whereby trans-

fer of the carrier between the conveyer and the station may be automatically effected.

15. A holder or carrier for a conveying apparatus of the character described, said carrier comprising a body portion, rods extending lengthwise thereof and projecting beyond its ends and connected with the body by suspension-rods, hook-shaped projections fixed on said longitudinal rods, and stop projections on one of said latter rods.

16. In a conveying apparatus, the combination of a track, a conveyer thereon, inclined ways extending transversely of the track at a receiving-station, a holder on said ways, and a spring-held catch to engage the said holder when the latter is at the high end of the ways, the conveyer having provision for displacing said catch.

17. The combination of the track, the conveyer thereon, and the receptacle or carrier adapted to lodge on said conveyer, the conveyer and carrier having stop pieces or catches adapted for engagement to prevent separation thereof and one of said catches being movable relative to the other to permit separation of the carrier and conveyer at a predetermined station; abutments being provided on the carrier and at such station one movable with respect to the other and that on the carrier adapted to encounter that at the station; and the movable abutment coacting with the movable catch to displace the same, substantially as and for the purpose described.

18. The combination of the track, the conveyer thereon, and the receptacle or carrier, adapted to lodge on said conveyer, the conveyer and carrier having stop pieces or catches adapted for engagement to prevent separation thereof, and one of said catches being movable relative to the other to permit separation of the carrier from the conveyer at a predetermined station, and an abutment at that station, for the carrier to encounter, provisions existing for displacement of the movable catch by coaction with the carrier.

19. The combination of the track, the conveyer thereon, and the receptacle or carrier adapted to lodge on said conveyer, the conveyer and carrier having stop pieces or catches adapted for engagement to prevent separation thereof and one of said catches being movable relative to the other to permit separation of the carrier and conveyer at a predetermined station; and an abutment at such station in the form of a pivoted arm normally standing in the path of a projection on the carrier and having associated with it a projection adapted to enter the path of the movable catch and effect the displacement thereof when the abutment-arm is displaced, substantially as described.

20. The combination of the track, the conveyer thereon, and the receptacle or carrier adapted to lodge on said conveyer, the conveyer having a trip-lever normally standing behind a projection on the carrier and the latter having an abutment projection; and

a lever located at a station where the carrier is deposited, an arm of said lever normally standing in the path of the said abutment projection on the carrier and another arm of
5 said lever having a projection to effect the displacement of the trip-lever, substantially as described.

21. In a conveying apparatus of the character described a fixed abutment-arm for the
10 carrier to encounter, and a spring-strip fastened to the arm and extending in front of

the portion thereof encountered by the carrier, said spring-strip adapted to be displaced by the latter and having a shoulder to prevent rebounding of the same after striking the 15 arm.

In testimony whereof I affix my signature in presence of two witnesses.

ALVARO S. KROTZ.

Witnesses:

H. E. SCHENCK,
P. O. FISH.