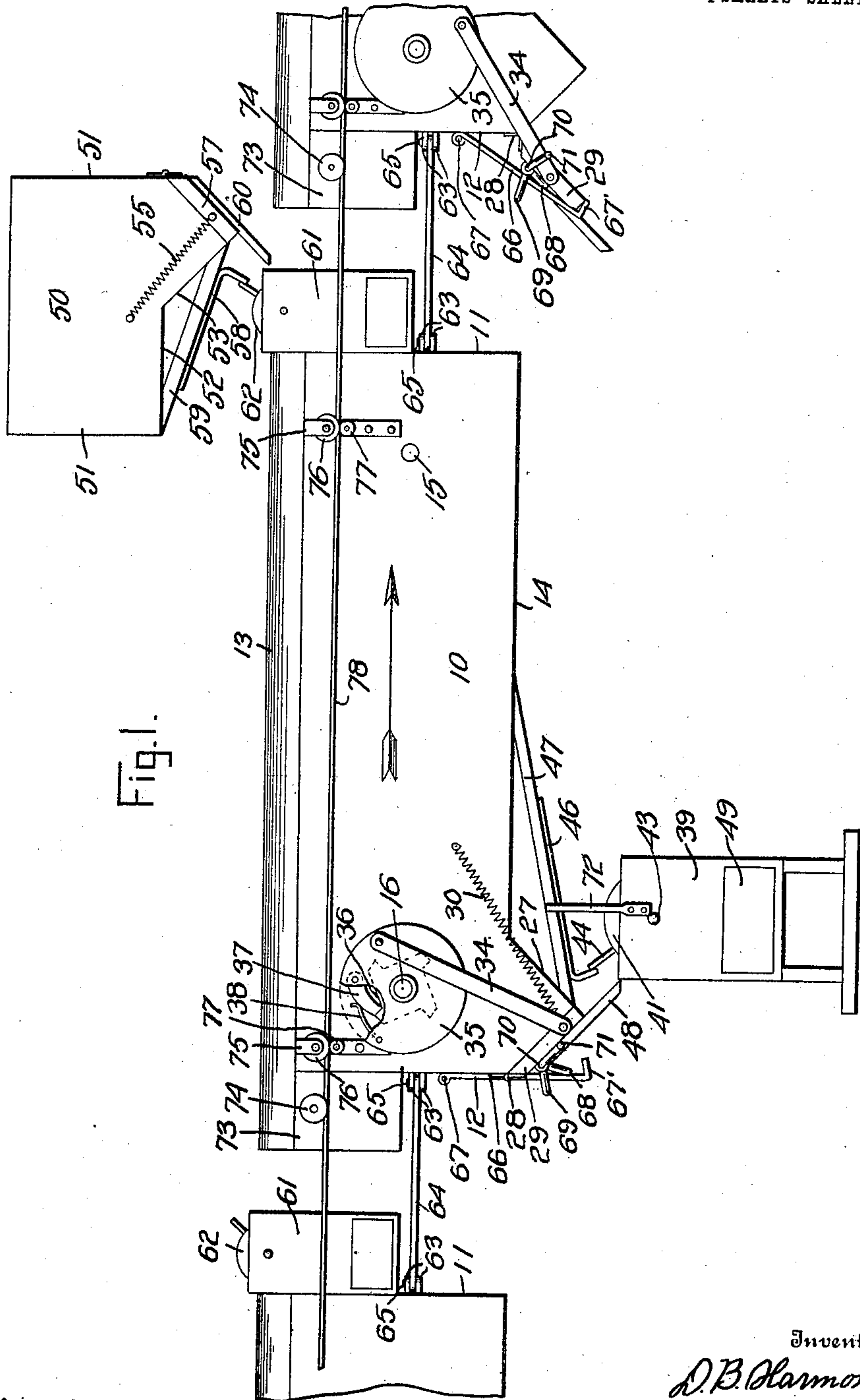


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MAIL DELIVERING APPARATUS.
APPLICATION FILED DEC. 7, 1907.

914,658.

Patented Mar. 9, 1909.
4 SHEETS—SHEET 1.



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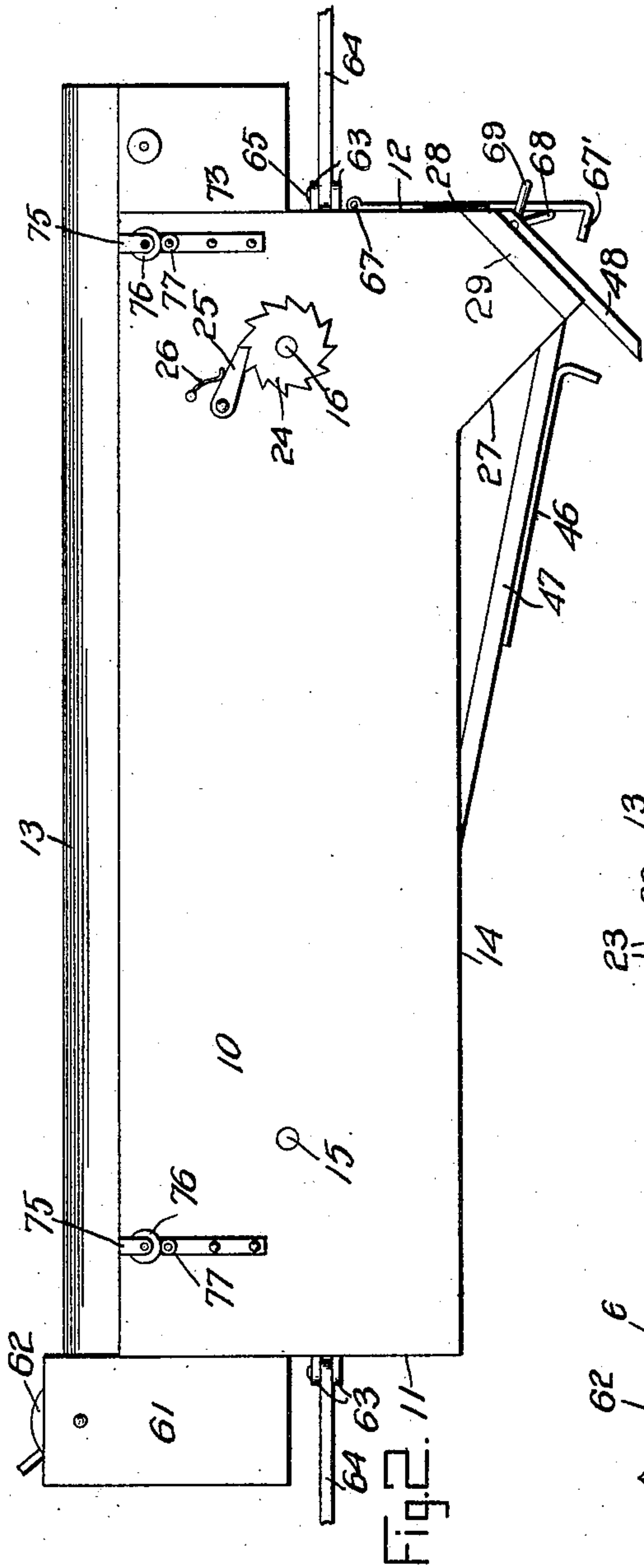


Fig. 2.

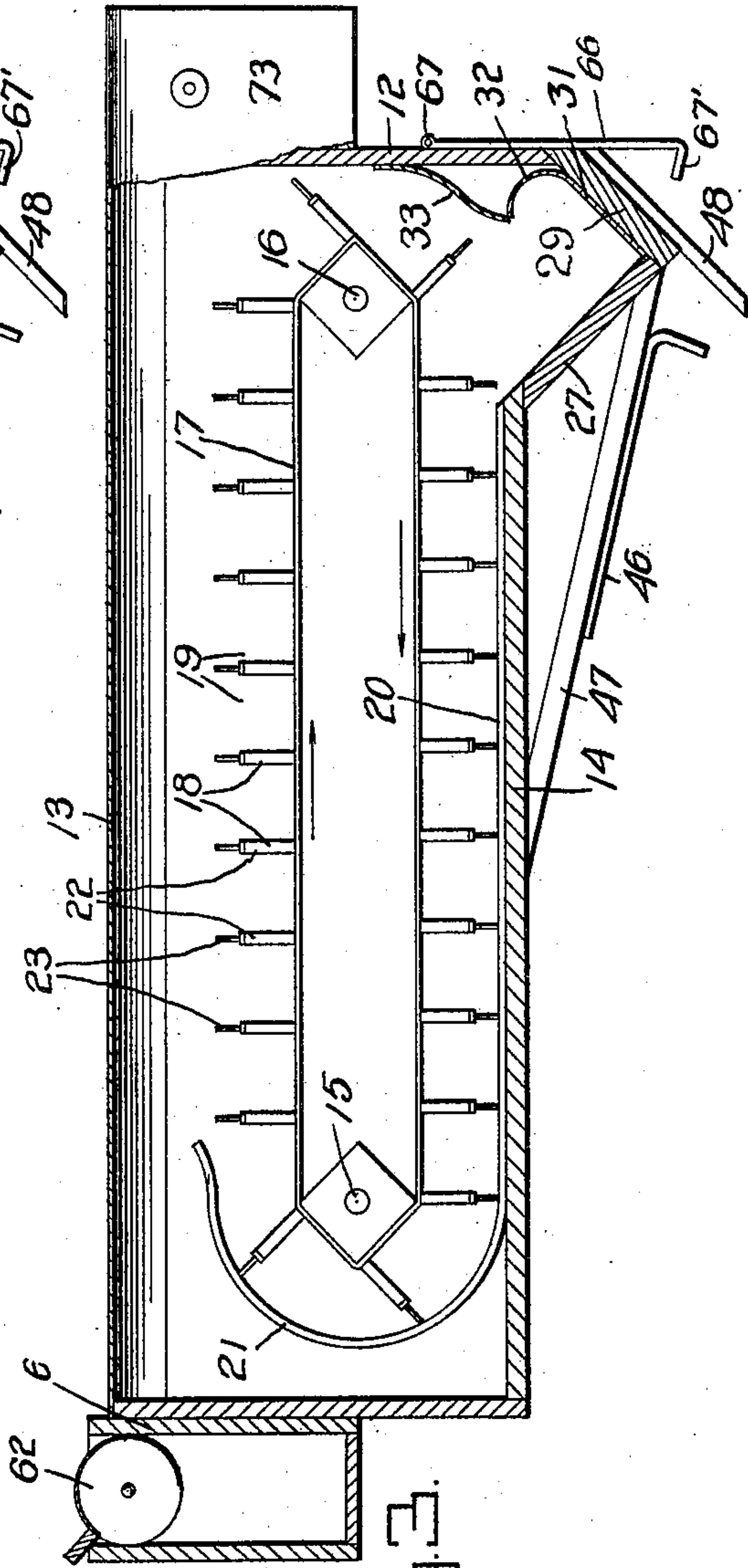


Fig. 3.

Witnesses

C. K. Reichenbach
J. G. Smith.

Inventor

D. B. Harmon

By

Charles Chandler

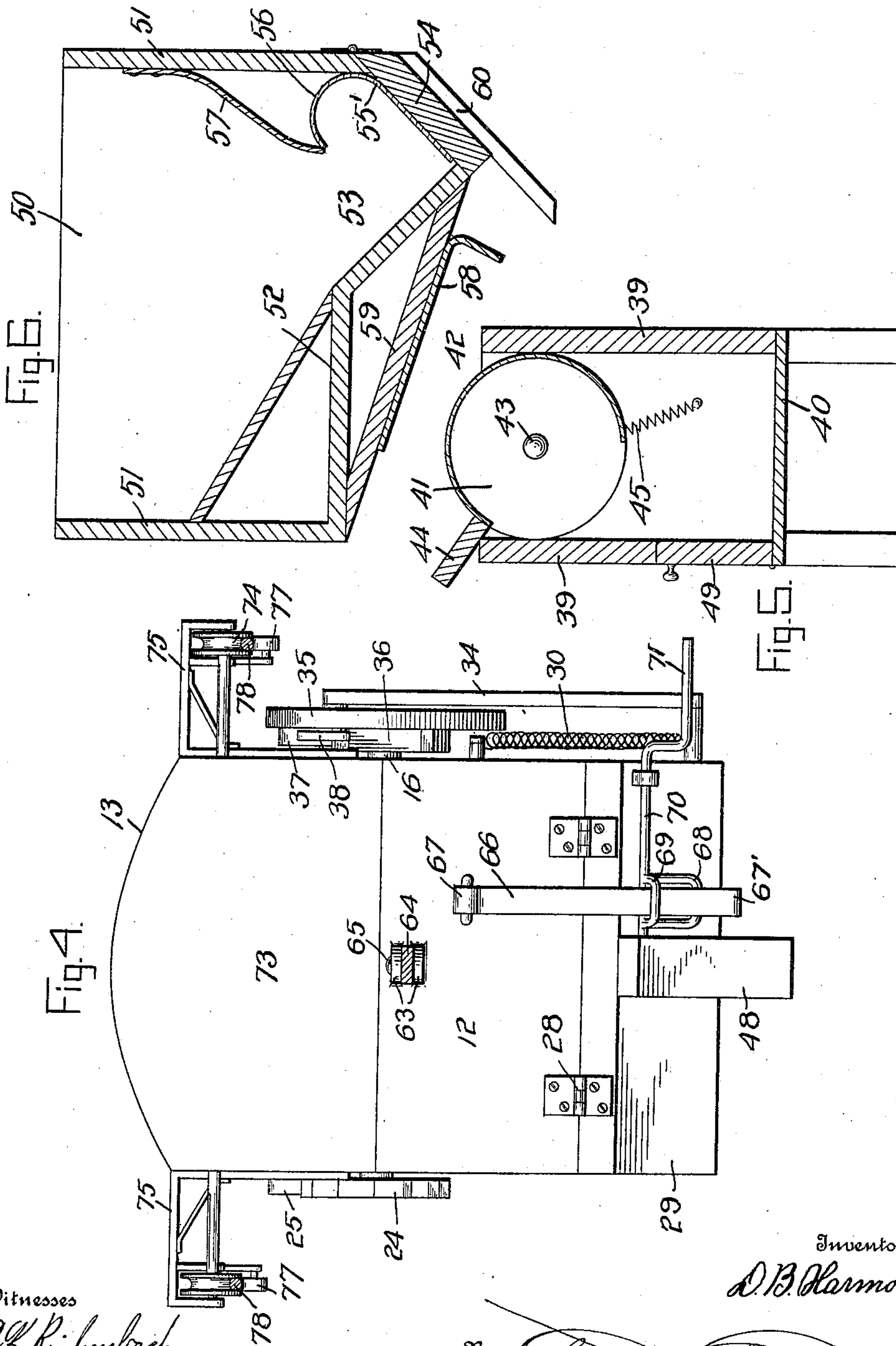
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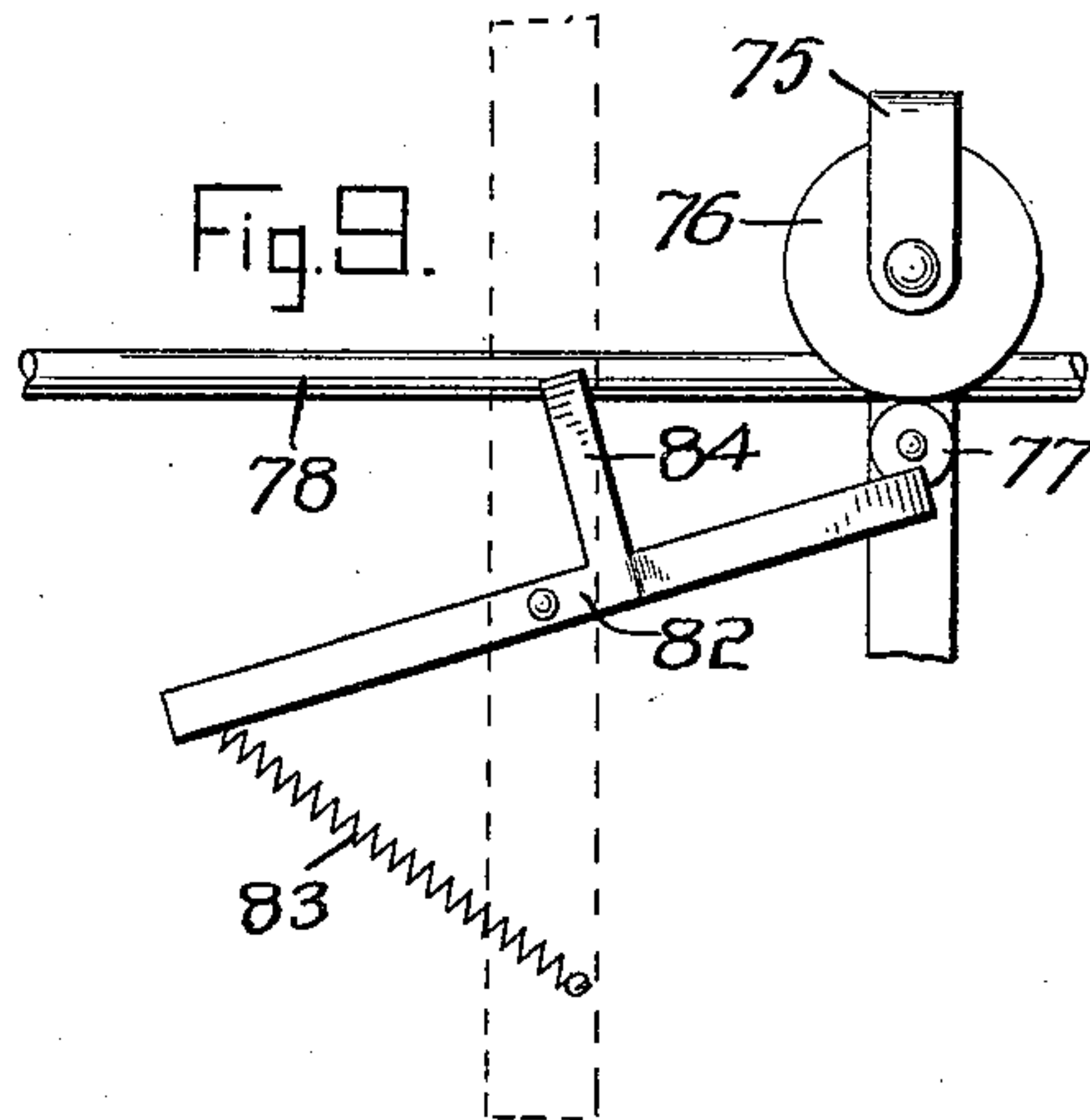
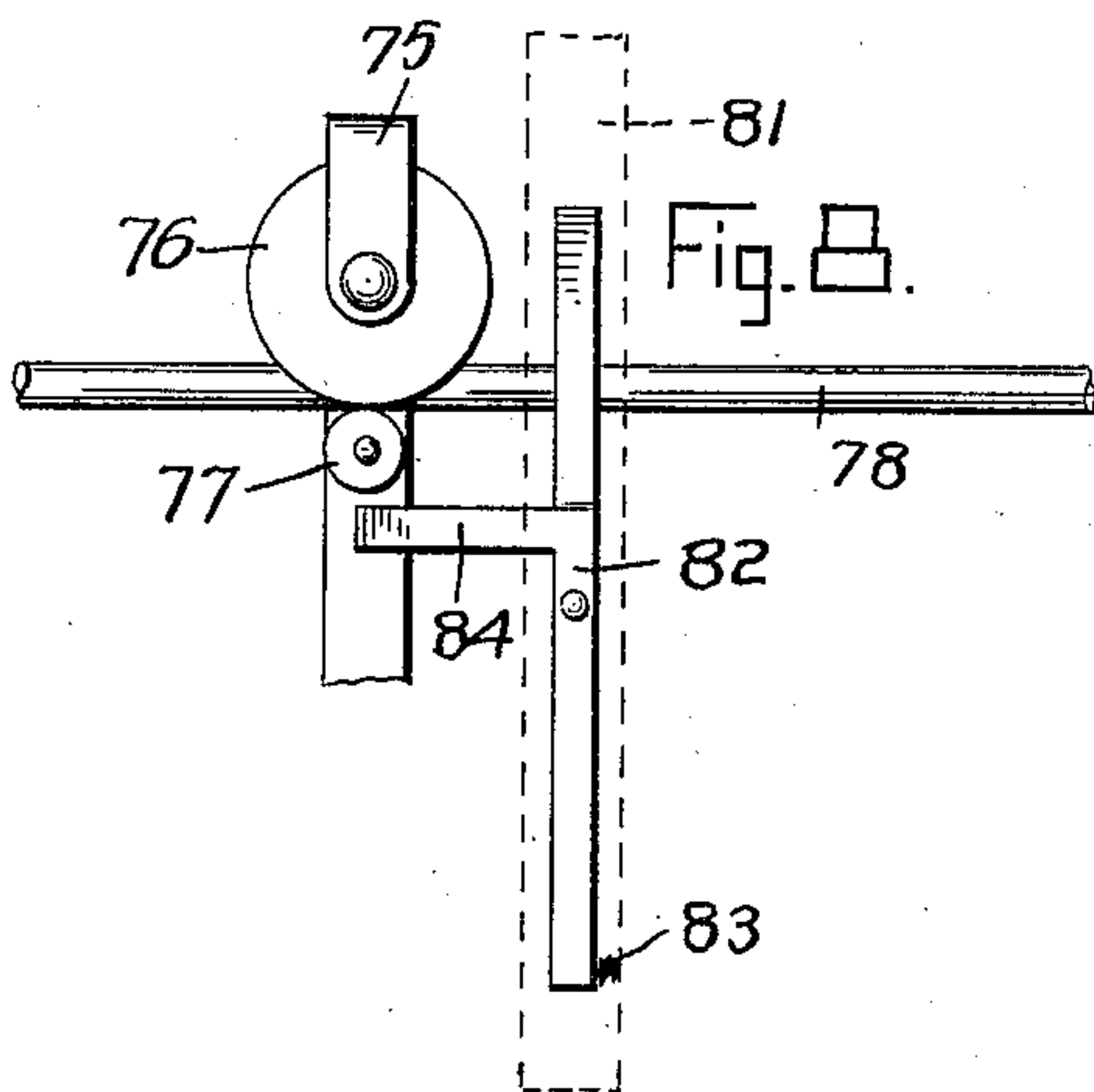
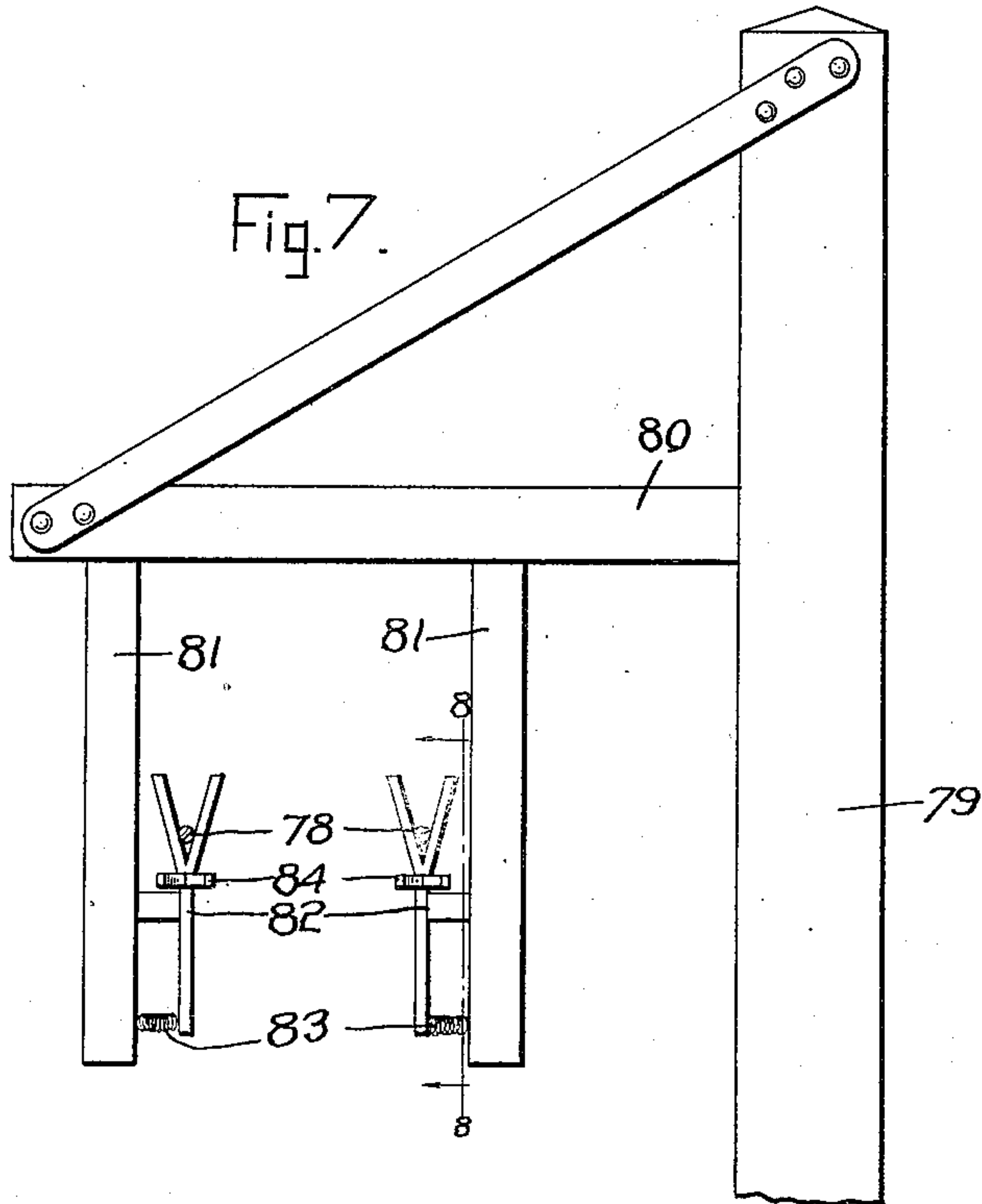
Inventor
D. B. Harmon.

334
Charles Chandler
Attorneys.

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Witnesses
E. H. Kirchbach.
H. G. Smith.

Inventor
D. B. Harmon.
By *Charles Canale.*
Attorneys.

UNITED STATES PATENT OFFICE.

DESALVO B. HARMON, OF SUTHERLAND, IOWA.

MAIL-DELIVERING APPARATUS.

No. 914,658.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DESALVO B. HARMON, a citizen of the United States, residing at Sutherland, in the county of O'Brien, State of Iowa, have invented certain new and useful Improvements in Mail-Delivering 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 mail delivery and collection systems and more particularly to that class which is designed or particularly well adapted for use on rural free delivery routes and the primary object of the invention is to provide a system of such character that mail, parcels, etc., may be distributed from a main station automatically to the different mail receptacles or in other words substations along the route and mail, parcels, etc., collected from these substations and conveyed to the main station where they are assorted and forwarded.

In connection with my system I, of course, employ mail carrying cars and within each of these cars there is arranged an endless belt supporting a number of mail receiving compartments, these compartments being designed to be brought successively into position to discharge their contents through a discharge opening located at one end of the car, this opening being normally closed by means of a door which is to be opened automatically as the car passes each mail receiving box along the mail delivery route, there being operative connection between the door and one of the shafts for supporting the belt whereby the belt will be moved one step each time the door is opened, this step by step movement of the belt serving to successively bring the mail compartments to discharge position as has heretofore been stated.

At each point where mail is to be delivered, a mail-receiving box and mail-delivering box are positioned, these boxes being designed to be opened respectively to receive mail from the mail car and to discharge mail thereinto. As some mail delivery routes include quite a number of substations or delivery points, I have found it expedient, where the system is used on such a route to employ two or more mail distributing cars, these cars being coupled together and one being inoperative until the preceding one has been emptied,

the first mentioned car having its discharge mechanism put in operation automatically when the second mentioned car has been emptied.

While the above broadly described features are the salient ones of the system, there are a number of subsidiary features which will be specifically brought out in the description which is to follow and in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a train of mail-distributing cars one car being shown in operative relation to the mail-receiving and mail-delivering appliances for one substation or mail delivering and receiving point, the mail-delivering mechanism of the preceding car being shown in inoperative relation, Fig. 2 is a detail side elevation, taken from the other side, of one of the cars, Fig. 3 is a vertical longitudinal sectional view through one of the cars, Fig. 4 is a rear end view thereof, Fig. 5 is a vertical sectional view through the mail-receiving box for one substation, Fig. 6 is a similar view through the mail-delivering box therefor, Fig. 7 is a view in elevation showing the manner of supporting the track wires for the cars, Fig. 8 is a view in side elevation showing the normal position of the support for one wire prior to being struck by one of the wheel bearings for the car, and, Fig. 9 is a similar view but showing the position of the support at the time it is struck.

In the first four figures of the drawings, illustrating specifically the mail-carrying and distributing car embodied in my invention, the car is shown as comprising sides 10, a front end 11, a rear end 12, a top 13, and a bottom 14. In other words, the body of the car is of oblong box-like formation. Journaled within the car adjacent the front end 11 thereof is a shaft 15 which has its intermediate portion squared and a similar shaft 16 is journaled in the car adjacent the rear end 12 thereof, there being an endless belt 17 trained over these two shafts. This belt may be of any suitable material and may be plain or stiffened as may be found most expedient depending of course upon its length. Fixed upon the belt in any suitable manner and projecting therefrom are a number of equidistantly spaced plates 18 which constitute, in effect, each a partition, these plates being of a width equal to the width of the car. These plates cooperate, as will be readily understood, to form between them a plurality of mail-receiving compartments which are

indicated by the numeral 19 each of these compartments being bounded by two of the plates, the side walls 10 of the car and the belt 17 except those compartments from the under stretch of the belt which are additionally bounded by a sheet metal plate 20 fixed upon the floor 14 of the car. This plate 20 or supplemental floor as it may be called is bent upwardly in the arc of a circle at its forward end as at 21 and this portion serves effectually to prevent dropping of the mail from the compartments as they pass successively over the shaft 15. I have found by experiment that by the provision of plates equivalent to the plates 18 having integral outer longitudinal edges, is unsatisfactory as letters are liable to slip from one compartment to another between the said edges of the plates and the supplemental bottom or plate 20 of the car and I have also found by experiment that by providing such edge of each plate with a plurality of teeth, this undesirable result is obviated. In the drawings such construction is shown as being in the form of a head or strip 22 secured to the said edge of each plate and formed with a plurality of wire-like or flattened teeth 23, these teeth being preferably of spring metal and being designed, by their passage over the surface of the plate 20, to retain in each compartment such mail as was originally placed therein and prevent the passage of such mail from one compartment to another. In order that this result may be attained in a most satisfactory manner it is necessary of course that the teeth be resilient and that they ride firmly over the said plate or in other words bear firmly thereagainst so as to insure scraping, so to speak, of the mail matter over the plate. The belt 17 above described is designed to travel in the direction indicated by the arrow in Fig. 3 of the drawings and in order to prevent backward travel of the belt a ratchet wheel 24 is fixed upon one end of the shaft 16 outwardly of the corresponding side 10 of the car and cooperating with this ratchet wheel is a pawl 25, this pawl being held by means of a spring 26 in engagement with the toothed periphery of the wheel. The manner in which the belt is caused to travel as stated will be presently described.

At the rear end of the car the bottom 14 thereof is directed downwardly and rearwardly as at 27 and the rear end 12 is also extended downwardly to a slight distance below the plane of the body of the bottom and hinged as at 28 to the lower edge of the said rear end 12 is a door 29 which serves to close the opening resulting between the said lower edge of the rear end 12, the lower edge of the portion 27 of the floor and the lower edges of the sides 10 of the car, the said sides at their rear ends being extended downwardly in a manner similar to the rear end 12

so as to form a hopper-like discharge chute. A spring 30 is connected at one of its ends to one side 10 of the car and at its other end to the corresponding side edge of the door 29 and this spring serves to normally hold the door closed, the discharge of mail from the car being of course prevented until such time as the door is opened. The shaft 16 is positioned substantially in a vertical plane with the lower edge of the portion 27 of the floor and as the toothed edges 23 of the plates 18 sweep over the rear end of the plate or supplemental bottom 20 the mail contained between such plate 18 and the succeeding plate will be discharged or dropped into the hopper-like discharge chute. A plate 31 is attached to the inner face of the door 29 and this plate has its upper portion curved upwardly and in a forward direction as at 32 there being a guard plate 33 fixed upon the inner face of the rear end 12 of the car and extending downwardly and terminating at the upper edge of the portion 32 of the plate 31 to normally cover the said edge and prevent mail falling between the rear end wall 12 of the car and the said portion 32 of the plate 31 it being understood that when the door 29 is swung downwardly and rearwardly to open position, the portion 32 of the plate 31 will move from its normal relative position with respect to the car plate 33 and will serve to positively eject the mail matter contained in the hopper-like chute.

As has heretofore been stated, there is operative connection between the door 29 and the shaft 16 whereby each time the door is opened, the shaft will be rotated to the proper degree to feed the belt 17 the distance of one mail-receiving compartment, and this means is in the form of a pitman 34 pivotally connected at one end with one side edge of the door and at its other end to a crank disk 35 which is loosely mounted upon the shaft 16 at that end thereof opposite to the end to which the ratchet disk 24 is fixed, there being a ratchet 36 fixed upon the said end of the shaft between the said crank disk 35 and the adjacent side of the car and a pawl 37 pivoted to the disk and held in engagement with the ratchet by means of a spring 38 which is fixed upon the disk.

It will be understood from the foregoing that upon opening the door 29, the crank disk 35 will be rotated to such a degree as to cause the pawl 37 carried thereby to ride over and engage with one of the teeth of the ratchet 36, the spring 30 serving to return the door to closed position and in so doing rotate the ratchet 36 together with the shaft 16 to a degree sufficient to bring a new mail containing compartment into discharge position.

At each point along the delivery route at which mail is to be delivered and from which mail is to be collected there is positioned a

mail-receiving box and a mail-delivering box, the former of which will first be described, it being specifically shown in Fig. 5 of the drawings. As shown in the said figure, this box is comprised of four sides 39 and a bottom 40, the box being open at its upper end. A drum is mounted for oscillatory movement in the box and this drum comprises a pair of heads 41 which are connected by means of a substantially semi-cylindrical body portion 42 which is of a length equal to the width of the box, the drum being mounted for oscillatory movement, as stated, by means of suitable pivot bolts 43 which are passed axially through the heads thereof and through the sides of the box which the heads oppose. Along one edge of the body 42 of the open drum there is secured a radially extending strip or plate 44 and the drum is normally held, by means of a spring 45, in such position that the said strip or plate 44 rests against the upper edge of the front side of the box, the drum having a diameter equal to the distance between the front and back walls of the box so that normally the upper end of the box is closed. A trip 46 is fixed upon the under side of a cleat 47 which is fixed beneath the rear end of the car and this trip is designed to engage with the strip or plate 44 as the car passes over the box and oscillate or rotate the said open drum so as to bring its open side uppermost, there being a trip 48 fixed upon the outer face of the door 29 and designed to ride over the upper edge of the front wall of the box and thereby open the said door and permit discharge of the mail matter from the chute into the said open drum, the drum being of course automatically returned to normal position through the instrumentality of the spring 45 and serving when so returned to drop or discharge the mail contained therein, into the box, there being a door 49 hinged in the front wall of the box whereby the mail may be removed therefrom.

The mail box for each station is comprised of side walls 50, end walls 51 and a bottom 52 one end of the bottom being extended downwardly at an angle as at 53 as in the case of the bottom of the car as previously described, the sides 50 of the box being also extended downwardly as in the case of the sides of the car at the rear end thereof. A door 54 is hinged to the lower edge of that end wall 51 of the box which is adjacent the portion 53 of the floor 52 and the door is normally held closed by means of a spring 55, shown in Fig. 1 of the drawings. A mail ejecting plate 55' is fixed upon the face of the door 54 and, as in the case of the plate 31, has its upper portion curved upwardly and inwardly as at 56, there being a guard plate 57 fixed upon the inner face of the above mentioned wall 51 this guard plate serving the same function as the plate 33 previously described. A trip 58

is supported, by means of a cleat 59, beneath the bottom 52 of the box and a cleat 60 is secured upon the outer face of the door 54. Upon each of the cars there is provided a mail receptacle which is indicated by the numeral 61 and which is identical in construction, except for supporting legs, with the substation receptacle previously described including a drum 62 identical with the drum 41. As the car passes beneath the mail distributing box of each substation, the trip 58 of such box strikes the plate or strip carried by the drum 62 and partially rotates the drum and subsequently the trip 60 strikes the upper edge of the front wall of the box 61 and the door 54 is in this manner opened, permitting any mail contained within the said box 50 to discharge or drop into the box 61 from which it is to be removed when the car turns from the main or distributing station.

As heretofore stated, it is sometimes desirable to couple several of the cars and in order that this may be done, a pair of ears 63 is formed upon each end wall of each car and the coupling bar 64 is inserted at its ends between the ears upon the opposed ends of the cars to be coupled and pivot or coupling pins 65 engaged through the ears and the ends of the coupling bar. When so coupled, it is of course necessary that some means be provided whereby only one car will be operative at a time and whereby the cars may be successively put into operation as the preceding car becomes emptied, and such means will now be described. A detent 66 is pivoted as at 67 upon the rear end wall of each car and at its lower end this detent which is in the form of a bar is bent inwardly or rather in the direction of the rear end of the car as at 67' and in a manner and to a degree to permit of its engagement with the outer or free edge of the door 29 when the said door is swung to open position and in this manner hold the door in such position. This detent is engaged through yoke or crank portions 68 and 69 formed upon a rock shaft 70 mounted upon the outer face of the said door. These yoke portions 68 and 69 are disposed at an acute angle with respect to each other and whereas the yoke 68 serves as a lifter for the detent 66 the yoke 69 serves as a guide for said detent and prevents it moving out of the path of movement of the lifter yoke 68. The shaft 70 has its outer end cranked as at 71 and this cranked end of the shaft is designed to engage with a vertically disposed drop rod or arm 72 fixed from one of the mail-receiving boxes whereby the shaft will be rocked by such engagement to bring its yoke portion 68 into positive lifting engagement with the detent bar 66 and thereby raise the same from engagement with the edge of the door and permit dropping of the door to closed position. For example should

two of the cars be coupled in tandem and each contain twenty mail-receiving compartments and there are forty mail-receiving boxes to be supplied, the door of the rear car, before being started from the main station, is opened and the detent engaged therewith to hold the door in this position. The forward car is then the only one of the two which is operative. Upon the twentieth mail-receiving box in the order in which they are passed by the car there is located the trip arm 72. When the cars pass this box the trip arm will engage with the cranked end 71 of the shaft 70 and rock the shaft to release the door of the said rear car, it being understood that upon passing the twenty-first box the said door will be opened and the mail in the first compartment of the box discharged into the said twenty-first mail-receiving box. The door of the preceding car will of course be opened and closed each time a mail-receiving box is passed but this in no way affects the operation of the door of the rear car and in fact produces no result whatsoever as the preceding car has already been emptied.

It is my intention that the car be suspended from two parallel wires one of these wires being a feed wire for supplying current to an electric motor 73 mounted at the front end of each car, the trolley wheel of this motor being indicated by the numeral 74. A bracket 75 is fixed upon each side 10 of each car adjacent the end thereof and journaled in each bracket is a grooved wheel 76 and below this wheel a roller 77, it being understood that the wheel 76 travels upon one of the wires above mentioned which wire is indicated by the numeral 78 and that the roller 77 travels beneath the wire and serves to prevent the wheels 76 leaving the wires. These wires are supported in a manner which will now be described. Uprights 79 are placed at suitable distances apart along the route traveled by the cars and from the arm 80 upon each upright there are supported depending parallel arms 81 to each of which and upon its inner face is pivoted a Y-shaped wire supporting member 82, the wires being received between the branches of the Y. These supporting members are normally held vertical by means of springs 83 which are connected to the lower ends thereof and to the arms 81 and formed upon each of the said members 82 at the junction of its branches with its stem is a V-shaped guide 84 the function of which will be presently more fully explained.

From an inspection of Figs. 8 and 9 of the drawings it will be seen that as the wheels of the car pass the wire supporting members 82, the said members will be rocked in the direction of travel of the car as is shown in Fig. 9 and that when so rocked their guide portions 84 will engage or receive the corresponding wire and prevent slipping of the

wire from the supporting members. After the wheels pass the members they are of course returned to their normal positions.

From the foregoing description of my invention it will be seen that I have provided in effect an over-head track, a car supported upon the track for travel thereon, receptacles arranged at points adjacent the track, and means whereby the receptacles are to be opened one to receive mail from the car and the other to discharge mail thereinto.

What is claimed, is—

1. A mail delivery apparatus comprising a car suspended for travel, said car being provided with a mail discharge-opening; an endless series of mail-receiving compartments in the car, and adapted to be brought successively into discharge position with respect to the discharge-opening; a door for said opening; means connected to and operable by the opening of the car door for feeding said mail compartments with a step-by-step movement; mail-receptacles disposed along the line of travel of the car; and means for operating the car door when it reaches said mail-receptacles.

2. A mail delivery apparatus comprising a car suspended for travel, said car being provided with a mail discharge-opening; an endless series of mail-receiving compartments in the car, and adapted to be brought successively into discharge position with respect to the discharge-opening; a door for said opening; means connected to and operable by the opening of the car door for feeding said mail compartments with a step-by-step movement; mail-receptacles disposed along the line of travel of the car; closures for said receptacles; means carried by the car for opening said closures; and means for thereafter opening the car door.

3. A mail delivery apparatus comprising a car suspended for travel, and provided with a mail-receptacle; a closure for said receptacle; mail-receptacles disposed along the line of travel of the car; closures therefor; means on the last mentioned receptacles for opening the closure of the car receptacle; and means for thereafter opening the closure of the second mentioned receptacle to discharge its contents into the car receptacle.

4. A mail delivery apparatus comprising a car suspended for travel, said car being provided with a mail discharge-opening; an endless series of mail-receiving compartments in the car, and adapted to be brought successively into discharge position with respect to the discharge opening; a door for said opening; means connected to and operable by the opening of the door for feeding said mail compartments with a step-by-step movement; a trip on the car in front of the door; an arm connected to and projecting from the door; mail-receptacles disposed along the line of travel of the car, and

located in the path of the aforesaid arm; a closure for said receptacles; and a stem projecting from said closure into the path of the aforesaid trip.

5 5. A trolley-wire support comprising a pivoted fork normally supporting the wire, and means carried by the fork for supporting the wire when said fork swings away therefrom upon being engaged by an object traveling along the wire.

10 6. A trolley-wire support comprising a pivoted member having forks extending

therefrom at different angles, one of said forks normally supporting the wire, and the other fork supporting the wire when the first mentioned fork swings away from the wire upon being engaged by an object traveling along the same.

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

DESALVO B. HARMON.

Witnesses:

LINCOLM E. ALEXANDER,
EDMUND C. BRIGGS.