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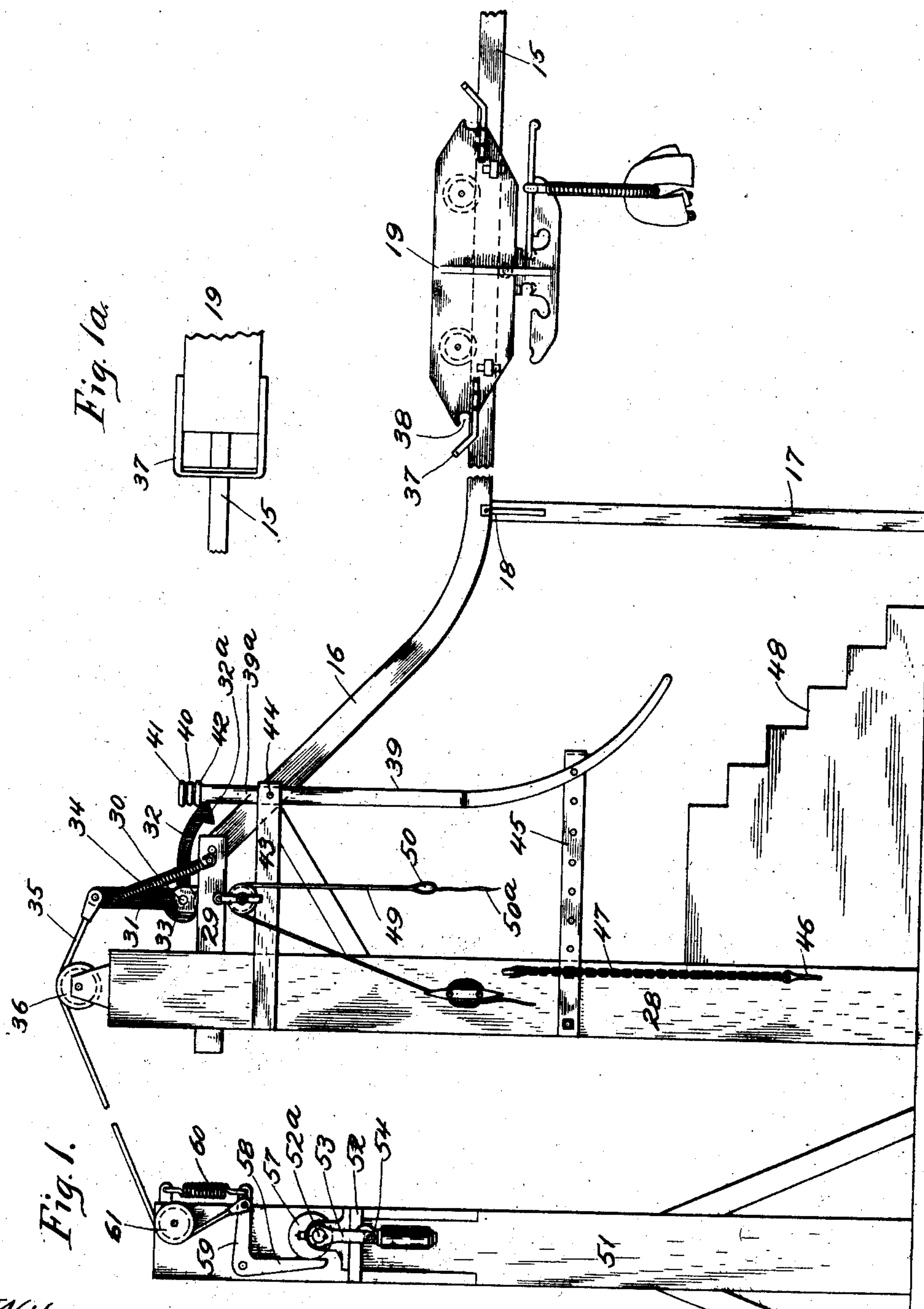
PATENTED MAR. 31, 1908.

A. J. RUDOLPH.

DEVICE FOR TRANSFERRING PARCELS TO AND FROM MOVING TRAINS.

APPLICATION FILED JAN. 21, 1908.

5 SHEETS—SHEET 1.



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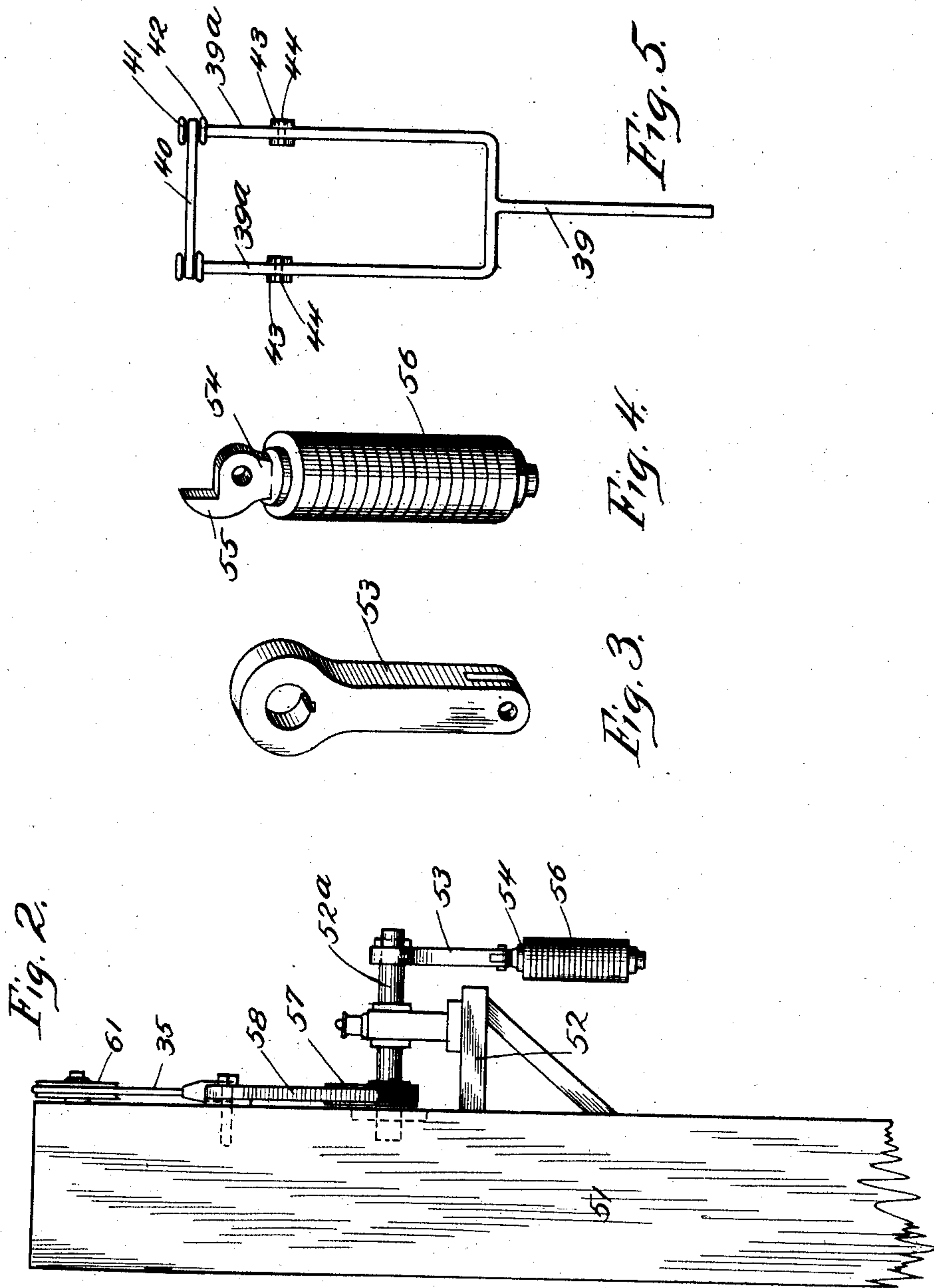
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5 SHEETS—SHEET 3.

Fig. 6.

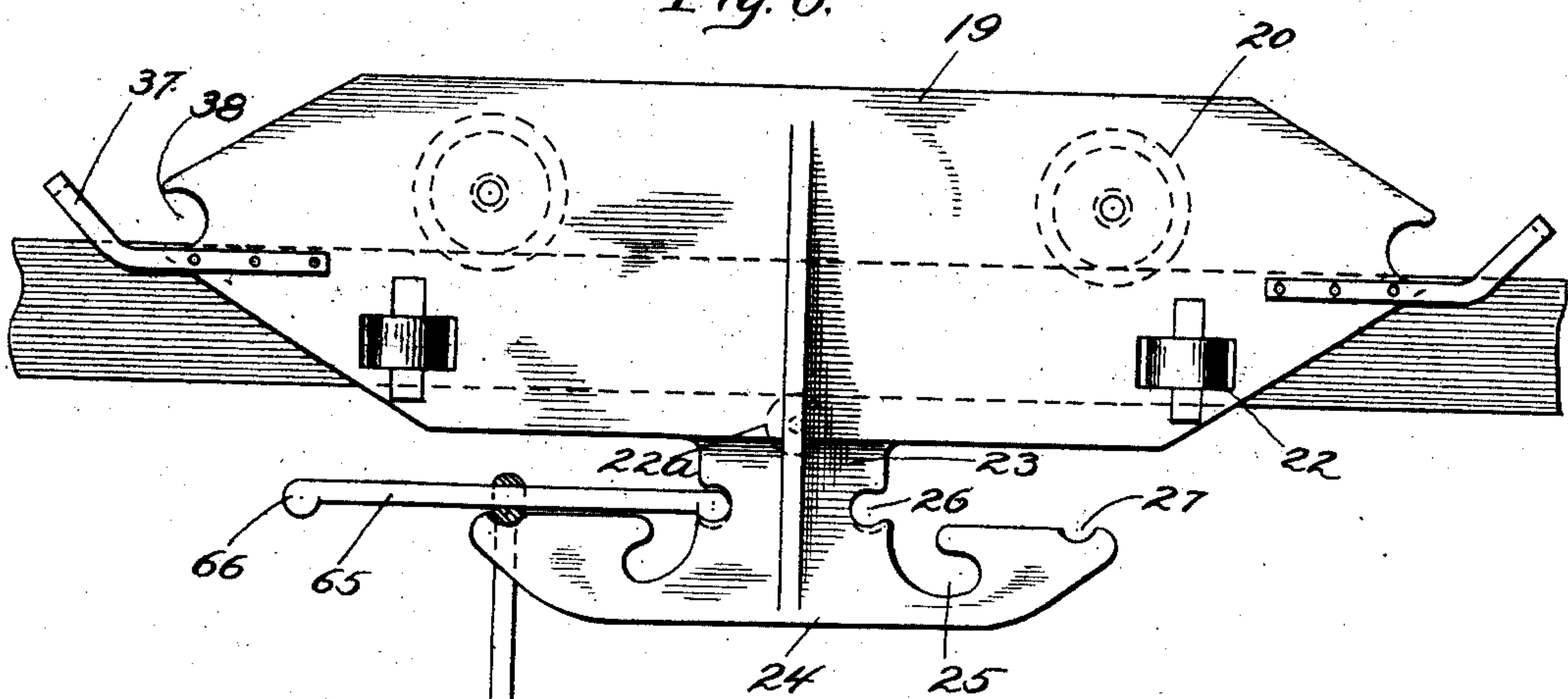
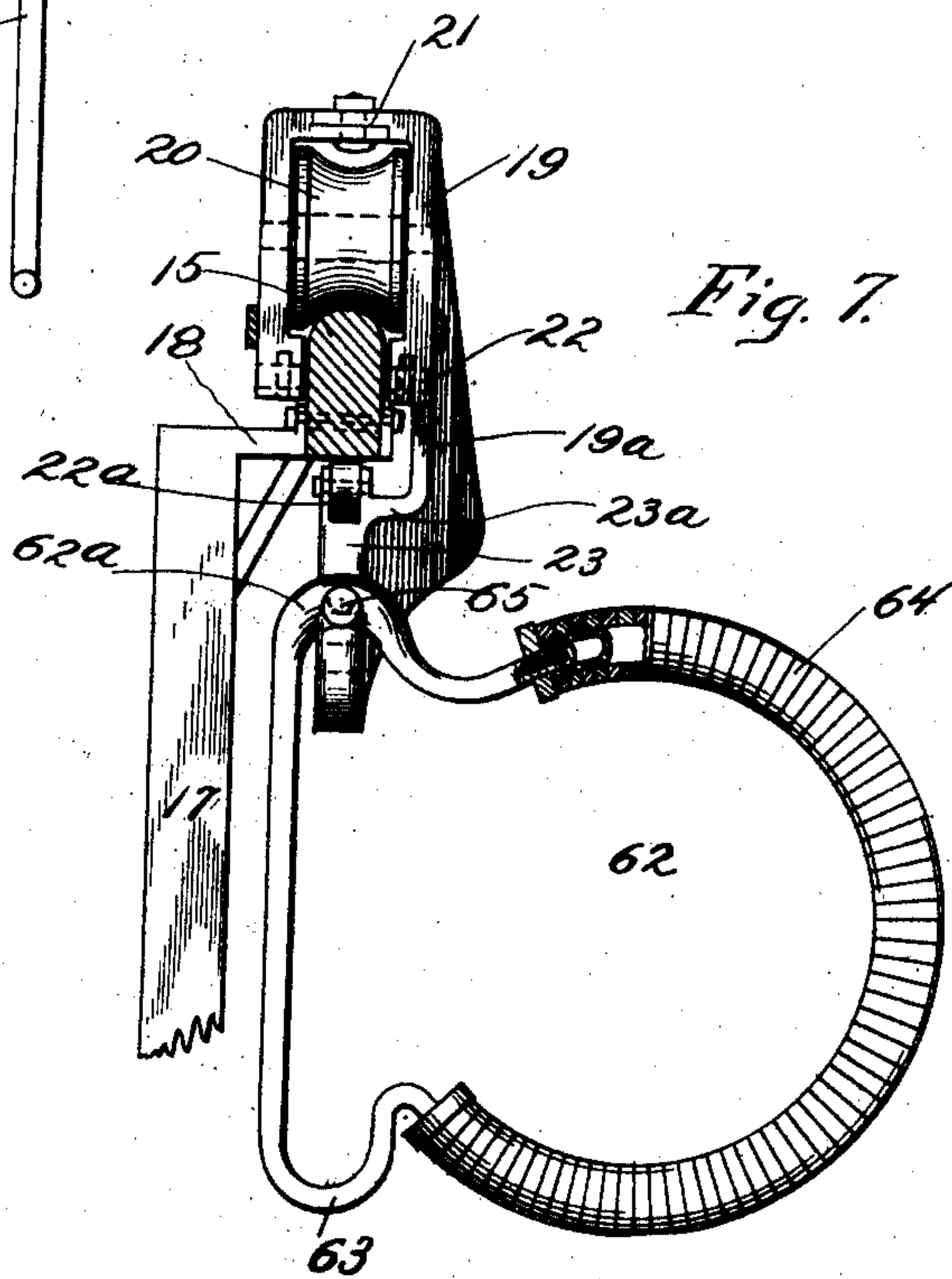


Fig. 7.



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6 SHEETS—SHEET 4.

Fig. 8.

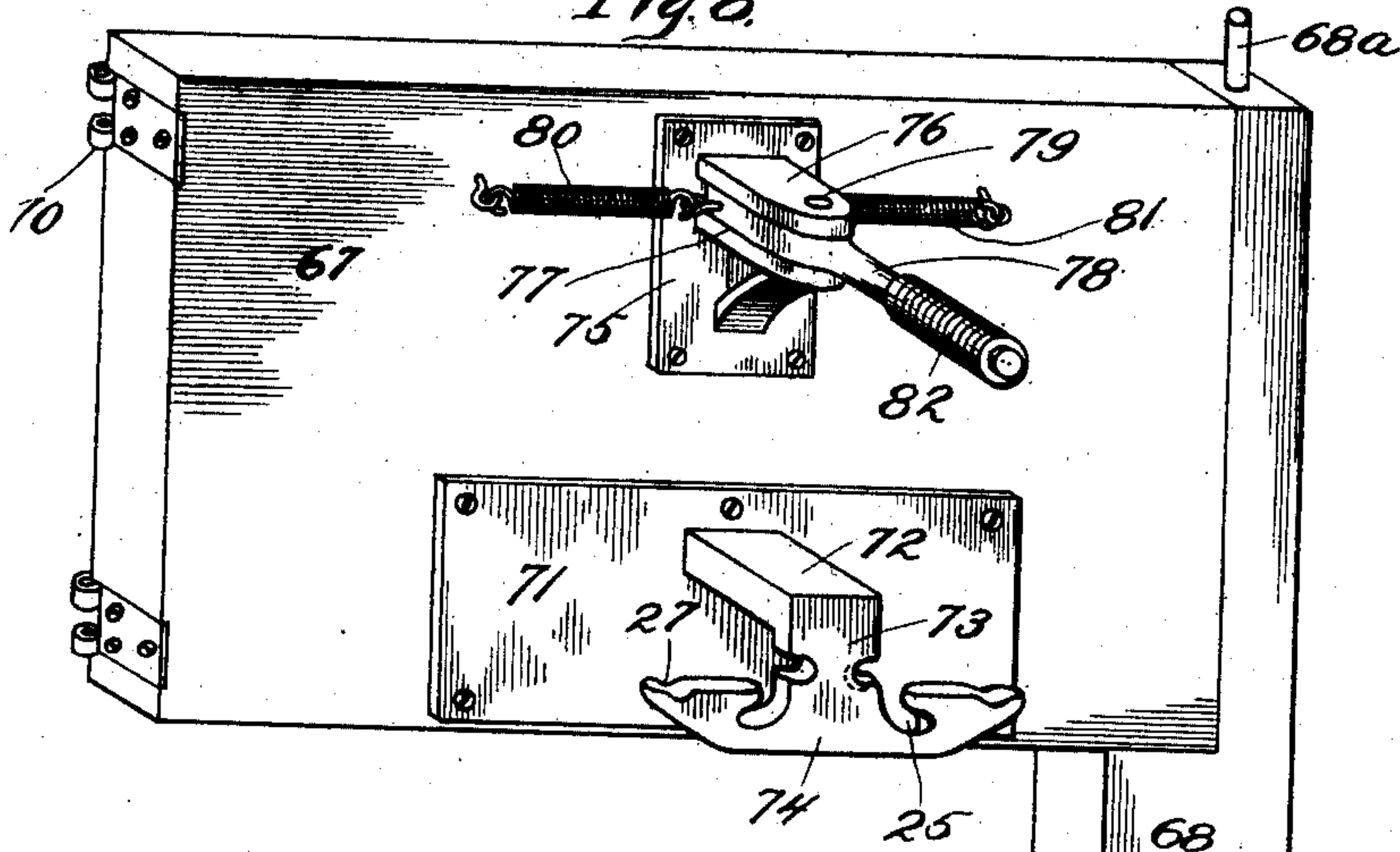
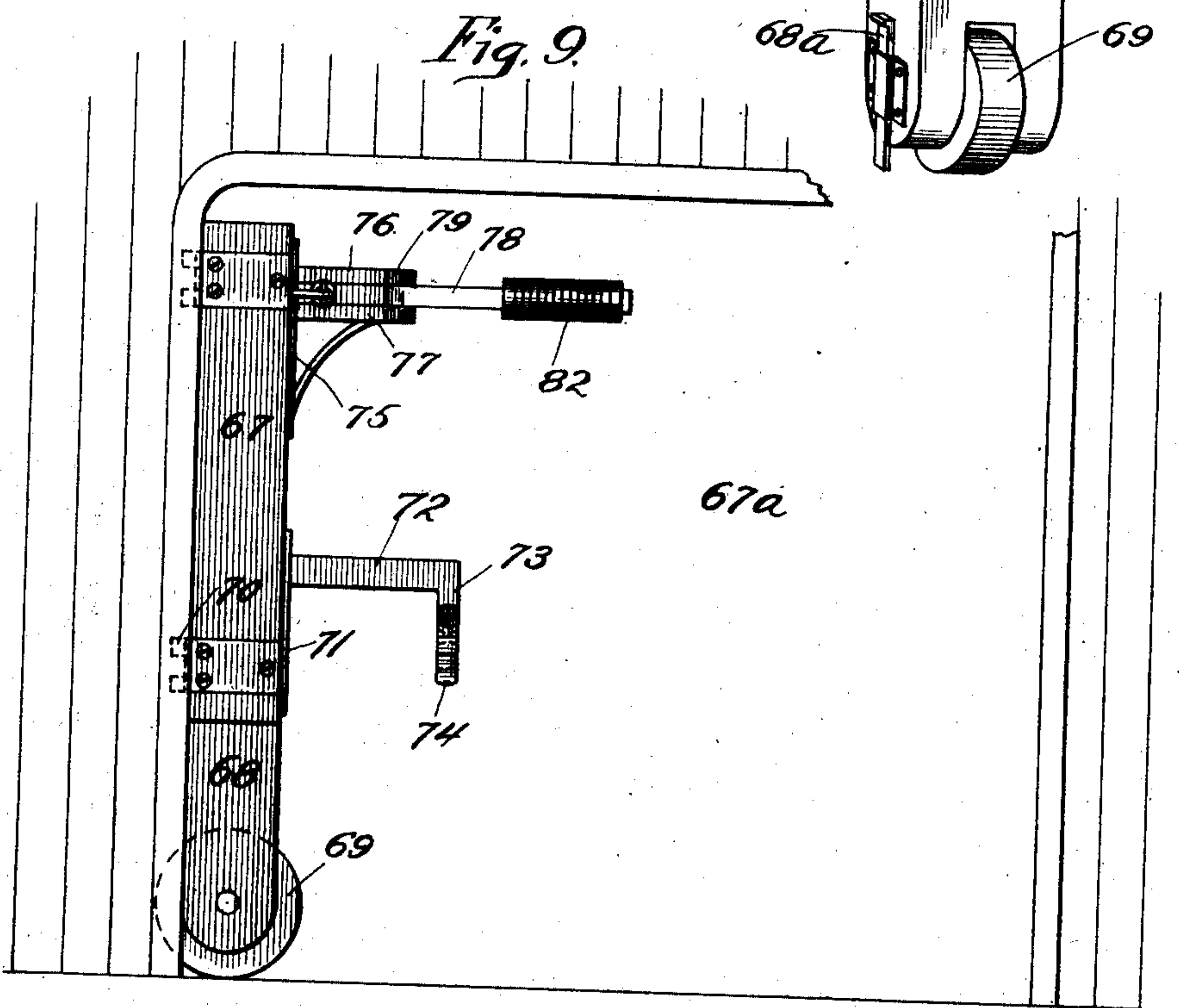


Fig. 9.



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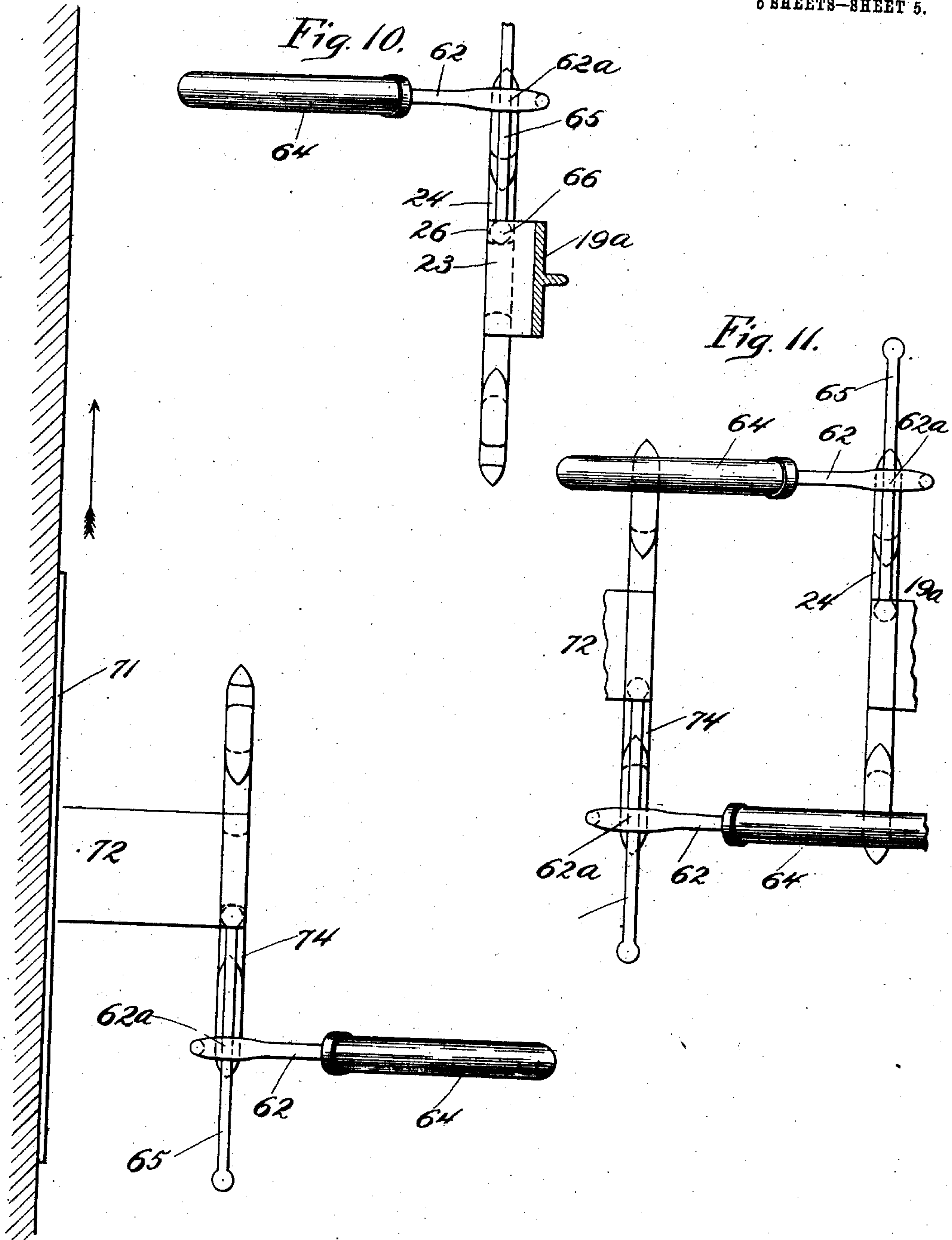
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6 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

ALEXANDER J. RUDOLPH, OF CHICAGO, ILLINOIS.

DEVICE FOR TRANSFERRING PARCELS TO AND FROM MOVING TRAINS.

No. 883,239.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed January 21, 1908. Serial No. 411,922.

To all whom it may concern:

Be it known that I, ALEXANDER J. RUDOLPH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Device for Transferring Parcels to and from Moving Trains, of which the following is a specification.

The object of my invention is to provide apparatus to be employed in connection with moving trains for the purpose of transferring mail bags or packages to or from the same.

As is well-known the transfer of mail bags to a moving train presents considerable difficulty, in that the mail bag receives a violent shock when it is snatched from a position of rest by some projecting member on the moving train. Moreover, it is highly objectionable to transfer mail from the train to the ground by merely throwing the mail bags out. They occasionally strike some object and are thrown back under the wheels of the train and ground to pieces. The fundamental principle of my invention is to give the mail bag or package a gradually acquired velocity alongside the track on which the train is moving, in the same direction therewith, but slightly less than the velocity of the train. Then the train overtakes the moving mail bag or other package and picks it up, the shock being insignificant, because it is merely due to the slight difference of velocity between the train and the moving package. I provide a moving carriage to carry along beside the track the mail bag or package to be picked up, as just described, by the moving train, and I also provide that this carriage shall receive from the train any package that is to be delivered therefrom. Thereafter, as the train goes on its way the carriage is slowed up automatically without giving any violent shock to the received package. It is obviously impossible to transfer heavy or fragile articles to or from a moving train by the old methods that have been referred to at the opening of this specification. But by means of my invention it will become possible to receive any ordinary express packages on a moving train or to deliver them therefrom without any slackening of the speed of the train. Thus the extension of the parcels post system may be facilitated.

My invention resides in the hereinafter

described means for accomplishing these purposes, as will be pointed out in the appended claims.

Referring to the drawings—Figure 1 is an elevation of the apparatus to be installed alongside the track at a station where it may be desired to interchange packages with a moving train. Fig. 1^a is a plan view of a detail of Fig. 1. Fig. 2 is an end elevation of part of the apparatus shown in Fig. 1. Figs. 3 and 4 are perspective views of details. Fig. 5 is an elevation of another detail. Fig. 6 is an elevation of the carriage which delivers mail to the moving train or receives it therefrom. Fig. 7 is an end elevation of the parts shown in Fig. 6. Fig. 8 is a perspective view of the skeleton door which carries the auxiliary apparatus on the train. Fig. 9 is an elevation of the doorway, showing the said skeleton door therein partly opened back. Fig. 10 is a plan showing the relation of the coacting parts on the train and on the moving carriage just when they are about to interchange their respective loads. Fig. 11 shows the same parts at a slightly later stage.

A long horizontal single rail or track is supported alongside the ordinary railway track by means of posts 17. Each post 17 has an offset 18 at the top (see Fig. 7) on which the rail 15 is supported. At its ends the rail 15 has inclined portions 16. It is to be understood that these inclines 16 are duplicates at the opposite ends of the rail 15 and that all the apparatus shown in Fig. 1 at the left-hand end of the rail 15 is duplicated in reverse position at the right-hand end.

A carriage 19 is mounted to run on the rail 15. Its structure is shown in detail in Figs. 7 and 9. It carries two wheels 20 which support its weight on the rail 15. This carriage has the general shape of a hood bent over the rail with a depending arm 19^a on one side thereof. This hood is jointed along its top, as indicated by the reference numeral 21, to facilitate its application or removal. Little side rollers 22 are provided to guide and steady the carriage. From the depending side or arm 19^a there hangs another arm 23 by an offset 23^a so as to bring it directly under the center of the rail 15. A roller 22^a is adapted to engage the under surface of the rail 15, being supported in the offset arm 23^a. A foot 24 is hung by this arm 23, these parts being shown most clearly in Fig. 6. The foot 24 has the notches 25, 26 and 27 duplicated on each end, all of which

are for purposes that will be set forth later. For the present it will be sufficient to state that this foot 24 carries the packages to be delivered to the train and receives other
5 packages from the train.

At the end of the track 15, supporting the inclined portion 16, is the post 28 having a bracket or arm 29 connected to the incline 16. This arm 29 also carries lugs 30 in which are
10 pivoted the two arms 31 and 32, as best seen in Fig. 1. The arm 32 has a lug 33 which engages the arm 31 and prevents the arms 31 and 32 from being rotated apart more than a certain definite angle; in this case about 90
15 degrees. A coil spring 34 pulls the arm 31 to the right and a cord, or other flexible member 35, running over the pulley 36, is adapted, when pulled upon, to act in opposition to the said spring 34. The arm 32 ter-
20 minates in a hook and there is a loop or eye 37 at the end of the carriage 19 which is adapted to be engaged by the said hook. Thus it will be seen that when the carriage 19 is pushed up the incline the hook 32 will
25 automatically engage the loop 37 and hold the carriage up. The hook 32 presents a beveled face 32^a to the approaching loop 37, and inasmuch as the arms 32 and 31 move independently of each other within a certain
30 limiting angle, the hook 32 is raised as the carriage approaches and then drops back by gravity and engages and holds the loop 37. Hooks 38 are provided at each end of the carriage. A cord 49 passes over a pulley on
35 the arm 29 and has a loop 50 with a free end 50^a beyond the loop. This loop 50 will be hooked over the remoter notch 38 and then an operator standing on the platform 48 and pulling on the cord can advance the carriage
40 to where it will be caught and locked by the hook 32. Thereafter the loop 50 may be detached by means of the end 50^a and allowed to hang as shown in Fig. 1.

Arms 43 project from the post 28 and on
45 pivots 44 at their ends carry the lever 39. (See Fig. 5) The top end of this lever is forked, the branches being designated as 39^a. A strong elastic rubber band 40 passes around the upper extremities of the lever 39, being
50 held in place by the washers 41 and 42. The lower end of the lever 39 is adapted to be swung inwardly toward the post 28 by an operator standing on the platform 48. A guide 45 with regularly spaced holes projects
55 from the arms 48 and the pin 46 supported by the chain 47 is adapted to go through any desired hole and thus hold the lever 39 in any desired position. The purpose of the lever 39 and its attached elements is as follows:
60 When the carriage 19 is at the top of the incline, the elastic band 40 engages the upper notch 38 on the carriage. The degree of tension on the band is then determined by the adjustment of the lever 39 with reference to
65 the guide 45. The elastic band serves to

start the carriage on its way with any desired degree of speed.

Another post 51 stands opposite the track beyond the post 28. A bracket 52 projects from the post 51 and carries a short shaft
70 52^a. The crank 53 depends from the shaft 52^a, and a depending arm 54 is pivoted to the lower end of the crank 53. A shoulder 55 on the lower arm 54 engages the upper arm 53 and prevents the two members 53
75 and 54 from being rotated apart more than 180 degrees. The depending arm 54 is surrounded with leather rings 56 for cushioning purposes, as will appear later. The shaft 52^a also carries an eccentric 57. A bent arm
80 lever 58—59 is mounted on the post 51 so that the arm 58 is engaged and deflected by movement of the eccentric, 57 while the other arm 59 is connected to the cord 35 running over the pulley 61. A spring 60 acts
85 in opposition to a pulling movement on the cord. An element on the moving train, to be described presently, strikes the depending arm 54 and thus through the mechanism that has been described releases the carriage 19.
90

Referring now especially to Figs. 6 and 7, the means for supporting the mail bags or other packages will be described in detail. A ring 62 has two opposed notches 62^a and
95 63 at one side thereof and the rest of the ring is surrounded by leather washers 64, to absorb shock. A bar 65 having knobs 66 on its ends extends at right angles to the plane of the ring 62 adjacent to the notch 62^a. The notch 62^a is adapted to hang on the
100 notch 27 of the foot 24 and the knob 66 on the end of the bar 65 is adapted to fit into the notch 26 on the foot 24. The mail bags or other packages are to be hung or securely
105 attached to the notch 63. It will be seen that the bar 65 co-acting with the notch 26 prevents any twisting displacement of the ring 62 or the packages supported thereby. The notch 26 is slightly cup-shaped on its lower side, as indicated by the dotted lines in Fig. 6.
110

Referring now especially to Figs. 8 and 9, the apparatus carried by the moving train will be described. A door opening 67^a in the side of the railway car has a skeleton door 67
115 hinged at one side. This skeleton door 67 extends across the top of the door opening and on the side opposite the hinges 70 has a depending leg 68 with a roller 69 at the bottom which is adapted to run on the floor of the car. The hinges 70 have their bolts on
120 the inner edge of the door posts so that the door 67 can be opened clear back against the inside wall of the car and thus leave the doorway 67^a entirely unobstructed and permit the use of the ordinary car door. A plate
125 71 is attached to the door 67 and a horizontal bracket projects therefrom having at its end a depending extension 73 which terminates in a foot 74 in all respects like the foot 24 that has been described in connection with the
130

carriage 19. Another plate 75 is attached to the door near its upper part and this has upper and lower projecting arms 76 and 77 with a horizontal swinging lever 78 pivoted between their extremities by the bolt 79. The end of this lever nearest the car is held in a median position by means of the opposed springs 80 and 81. The opposite end is incased with leather washers 82 as shock absorbers. Top and bottom bolts 68^a, and, if desired, a side bolt, are provided to lock the door.

The structural details of this embodiment of my invention having been set forth, I will now proceed to describe its mode of operation. The carriage 19 is pushed along the track toward that incline 16 which is at the end toward the expected train. The hook 32 automatically catches in the loop 37. To get the carriage 19 up the incline the cord 49 may be used in the manner described in connection with the previous mention thereof. After the carriage 19 is secured at the top of the incline 16, the elastic band 40 is hooked under the notch 38 in the upper end of the carriage. The lever 39 is drawn over to the desired point and secured by the pin 46 and then the apparatus is in readiness for the load to be applied. The notch 62^a of the ring 62 is hung over the notch 27 of the foot 24 on the carriage 19, and then mail bags or other packages are hung in the notch 63 of the ring 62. The ring is so hung that it will be on that end of the foot which points in the direction in which the expected train is traveling. At the same time that the ring 62 is hung on the foot 24, the bar 65, which is rigidly attached to the ring, has its knob end 66 dropped in the cup-shaped notch 26 on the foot 24. Thus the weight of the load hangs straight down on the carriage 19 and the main part of the ring lies in a plane at right angles to the railway track and extends out toward the main track from the local track 15. The apparatus is now in readiness for the approaching train.

The operator on the train swings his skeleton door 67 into the door opening, first hanging his mail bags and packages in a ring like that described to be used with the carriage 19. This ring member hangs on the notch 27 in that end of the foot 74 which is toward the rear end of the train. Without any further attention on his part the desired exchange is ready to be made. As the train approaches, the lever 78 on the skeleton door 67 strikes the depending arm 54 and thus rotates the eccentric 57 against the arm 58 of the bent arm lever 58—59. This causes a jerk on the cord 35, which rotates the arm 31 and thus by means of the shoulder 33 lifts the hook 32. Thereupon the carriage 19 is released and starts down the incline 16 under the acceleration of gravity and the tension of the elastic band 40. It is

easily seen that the elastic band 40 will disengage from the notch 38 on the carriage 19, thus leaving the latter free in its course along the track 15. The distance between the posts 28 and 51 being properly arranged, 70 and the lever 39 having been properly set, the oncoming train will overtake the carriage 19, as it passes along the track 15. The relation of the essential parts is then indicated in Fig. 10. It will be seen that the front end 75 of the foot 74 on the train will go into the ring which projects out toward the train from the moving carriage 19. The ring 62 on the carriage being caught by the foot 74 on the train will be given a twist that will 80 dislodge the knob 66 from its notch 26, and then the ring will be pulled entirely off the foot 24 and be carried along in the notch 25 of the foot 74 on the train. At the same time the ring on the train foot 74 will be carried 85 onto the carriage foot 24 and pulled off from the train foot and carried along the notch 25 of the carriage foot. Thereafter, the operator on the train can at his leisure swing the skeleton door 67 in and remove 90 the mail bags and packages from the foot 74. Meanwhile the carriage 19 will have run on to the incline 16 at the opposite end of the track from which it started, where its velocity will be checked and thereafter the 95 operator can remove the ring 62 with its burden.

The purpose of the joint between the two members 53 and 54 is to cause rotation of the shaft 52^a only when the train is going in the 100 proper direction. It will be obvious that for trains going in the opposite direction there will be merely an idle flexure of the joint between the two arms without any rotation of the shaft 52^a. The lever 78 is pivotally 105 mounted and held by springs so that if the end 82 should strike any unyielding object alongside the track the lever 78 would merely swing around past it. But the springs 80 and 81 are stiff enough to cause 110 the arm 78 to operate the shaft 52^a with its composite arm 53—54. It will be noted that the surfaces that strike together in operation of the device are covered with leather washers to ease the shock. As 115 shown in the drawings these washers are interchangeable, and may be tightly clamped in place.

Ordinarily the wheels or rollers 20 are the only ones that make contact with the rail 120 15, the rollers 22 and 22^a being provided merely as safeguards. If the load on the carriage 19 should be subjected to a lateral wind pressure, the rollers 22 on one side would come into play, and in passing from 125 the inclined track 16 to the level track 15 the roller 22^a would be utilized.

It will be observed that I have invented apparatus for shifting burdens from a station beside the track to a rapidly moving train, 130

by first accelerating them to a velocity nearly equal to that of the train in a direction parallel therewith so that the train may come up behind them and take them, the shock of the transfer being measured by the difference of velocity, which is comparatively small. Moreover, the same apparatus may be employed to shift burdens from the moving train to the station beside the track. In this case the burden is transferred to a carriage moving beside the track, which carries it on for a distance, absorbing its velocity after the train has passed on its way. Inasmuch as the kinetic energy of a body varies as the square of the velocity it will be seen that the destructive effect of the sudden arrest of speed should vary as the square of the speed. It, therefore, follows that in reducing the relative speed of shock between the moving train and the carriage, the destructive effect is reduced in a far greater proportion. That is, to illustrate, if a relative speed of sixty miles an hour produces a certain damaging effect, a speed $\frac{1}{6}$ as great, or ten miles an hour, ought to have only $\frac{1}{36}$ as much damaging effect. It will be obvious that there are various modifications of the specific apparatus that I have disclosed which may be made without departing from the principles of my invention, which I consider to be as broad as the appended claims.

In the following claims I employ the term track in a broad sense to designate any course that may be traversed by a carriage, as, for example, a cable, or a plurality of rails instead of a single rail.

What I claim is—

1. In a device of the class described, an auxiliary track parallel with a main railway track, a carriage on the auxiliary track, means located near said auxiliary track for giving said carriage a movement along it and means for transferring a burden between the said carriage and a car on the main railway track.

2. In a device of the class described, an auxiliary track parallel with a main railway track, upwardly inclined tracks connected to the ends of the auxiliary track, a carriage on the auxiliary track, and means for transferring a burden between the said carriage and a car on the main railway track.

3. In a device of the class described, an auxiliary track parallel with a main railway track, a carriage on the auxiliary track, means located near the auxiliary track for giving to the carriage a certain velocity along said track, and means for transferring a burden between the said carriage and a car on the main railway track.

4. In a device of the class described, a main car, a movable carriage adapted to travel beside the car in the same direction therewith and with a speed slightly different therefrom,

and means for transferring a burden between the main car and the carriage.

5. In a device of the class described, an auxiliary track beside a main railway track parallel therewith, a carriage on the auxiliary track, means for projecting the carriage along the auxiliary track from one end thereof, and means actuated by an approaching car on the main track for setting the said projecting means in action.

6. In a device of the class described, an auxiliary track beside a main railway track parallel therewith, a carriage on the auxiliary track, means for projecting the carriage along the auxiliary track from one end thereof, a stop to hold the carriage against such means, and a trigger for releasing the stop, said trigger being adapted to be actuated by an approaching car on the main track.

7. In a device of the class described, a single rail supported in an elevated position beside a main railway track parallel therewith, a carriage on said rail having a depending member, means for supporting a burden from said depending member, means on a railway car on the main track for taking the said burden from the carriage, and means for giving the carriage a movement along said rail independently of the movement of said car.

8. In a device of the class described, an auxiliary track beside a main railway track parallel therewith, a carriage on the auxiliary track, a foot depending from said carriage, a ring adapted to be supported by the foot with its plane transverse to the direction of the track, another foot carried by a moving car on the main track adapted to engage the said ring and remove it from the carriage foot to the car, and means for giving the carriage a movement along said auxiliary track independently of the movement of said car.

9. In a device of the class described, an auxiliary track beside a main railway track parallel therewith, a carriage on the auxiliary track, a foot depending from said carriage, a similar foot carried by a moving car on the main track, and a ring adapted to be carried on either end of either foot with its plane transverse to the direction of the track, whereby it may be transferred from one foot to the other.

10. In a device of the class described, an auxiliary track beside a main railway track parallel therewith, a carriage on the auxiliary track, an elastic member adapted to project the carriage along its track, a stop to hold the carriage at one end of its track in opposition to the elastic member, a trigger adapted to be actuated by a moving car on the main track, and connections from the trigger to the said stop.

11. In a device of the class described, means beside a main railway track for moving a burden parallel therewith, a stop to hold said means in restraint, a trigger adapted to

release said stop, and a projecting arm on a car on the main track adapted to actuate said trigger.

12. In a device of the class described, means beside a main railway track for moving a burden parallel therewith, a stop to hold said means in restraint, and a trigger adapted to release said stop, said trigger having a joint that permits an inoperative flexure in one direction only, whereby it may be actuated only by a push in the opposite direction.

13. In a device of the class described, means beside a main railway track for moving a burden parallel therewith, a stop to hold said means in restraint, a trigger adapted to release said stop, and a projecting arm on a car on the main track adapted to actuate said trigger, said arm being held out from the car by elastic means whereby it may yield without being broken if it strikes a resisting object.

14. In a device of the class described, apparatus beside a main railway track for transferring a burden to or from a car on said track, an inwardly opening skeleton door on said car, and means projecting out from the outer face of the door for actuating the said apparatus.

15. In a device of the class described, apparatus beside a main railway track for transferring a burden to or from a car on said

track, a skeleton door on said car, and a foot projecting from the door adapted to receive or deliver said burden.

16. In a device of the class described, a skeleton door on a railway car hinged in the door opening so as to open inwardly, and apparatus attached to the door for delivering a burden to a way station or receiving a burden therefrom.

17. In a device of the class described, an auxiliary track beside a main railway track, a carriage comprising a hood hanging over the auxiliary track, supporting wheels within the hood adapted to run on the top surface of the track, guide wheels within the hood adapted to engage the sides of the track, and a guide wheel attached to the hood and adapted to engage the under side of the track.

18. In a device of the class described, a burden transferring apparatus beside a railway track, a post beside the track at a distance from said apparatus, a trigger on the post adapted to be actuated by a projecting part on a moving car, and a cord extending from the said apparatus to the post, said cord being adapted to communicate movement of the trigger to actuate said apparatus.

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