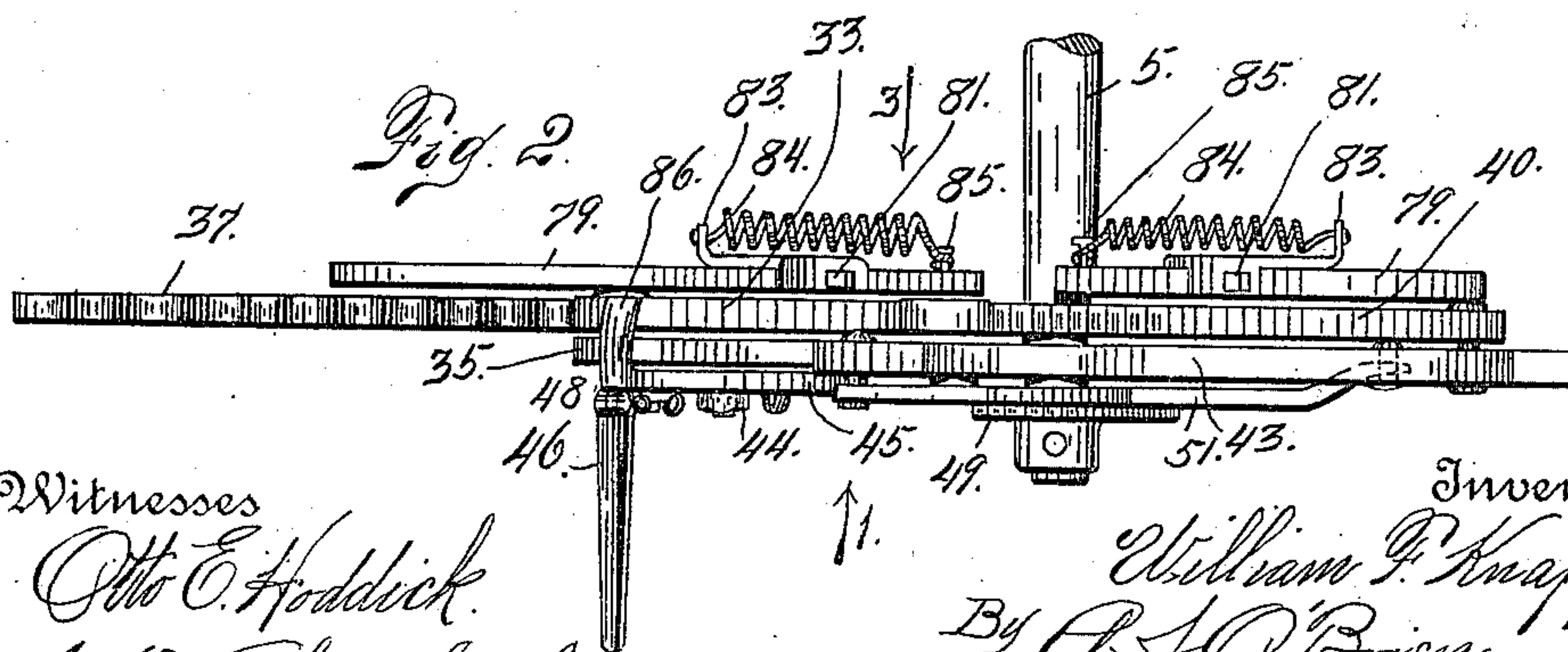
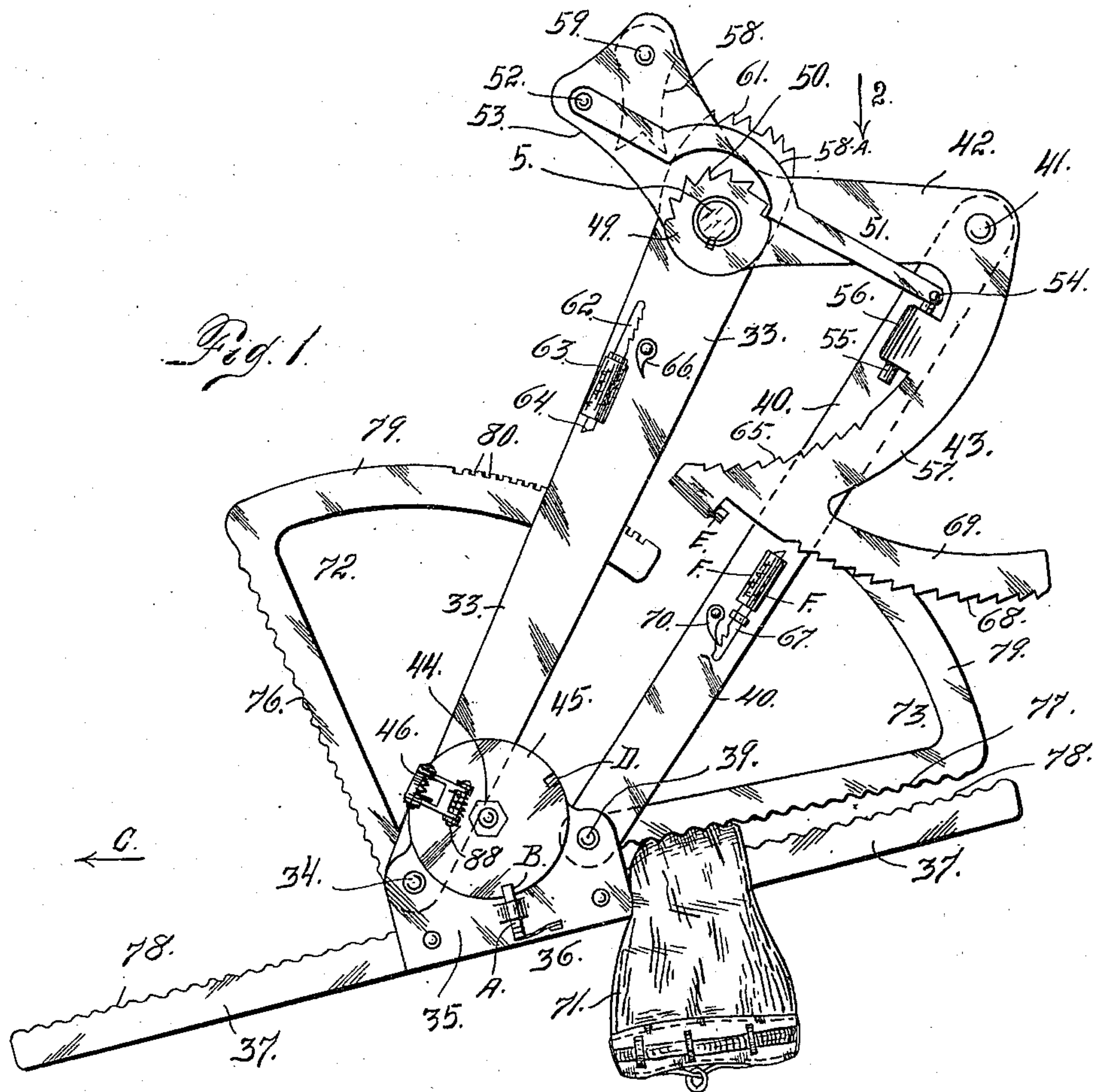


976,374.

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MAIL POUCH EXCHANGING APPARATUS.
APPLICATION FILED NOV. 22, 1909.

Patented Nov. 22, 1910.

7 SHEETS—SHEET 1.



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7 SHEETS—SHEET 2.

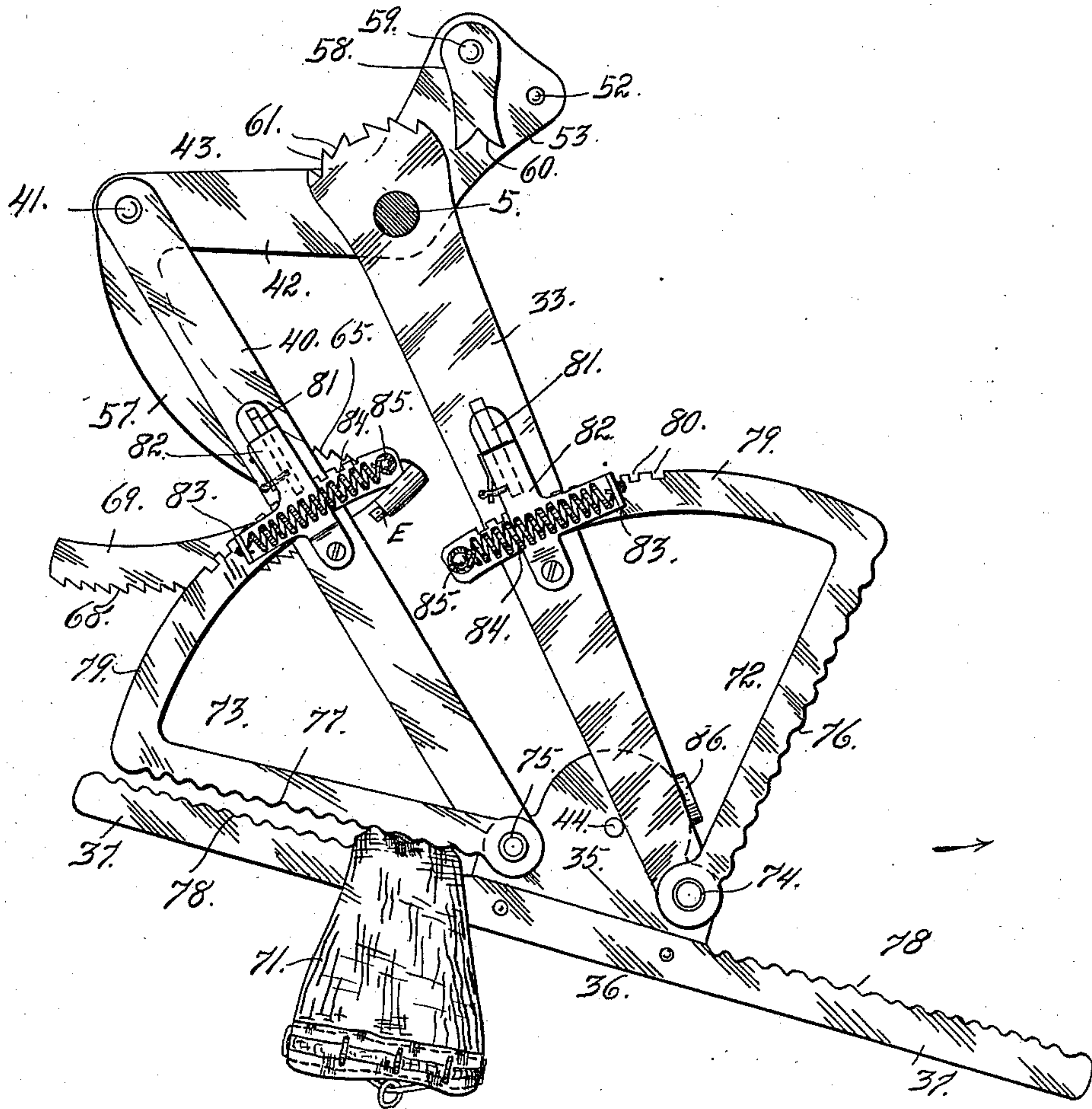


Fig. 3.

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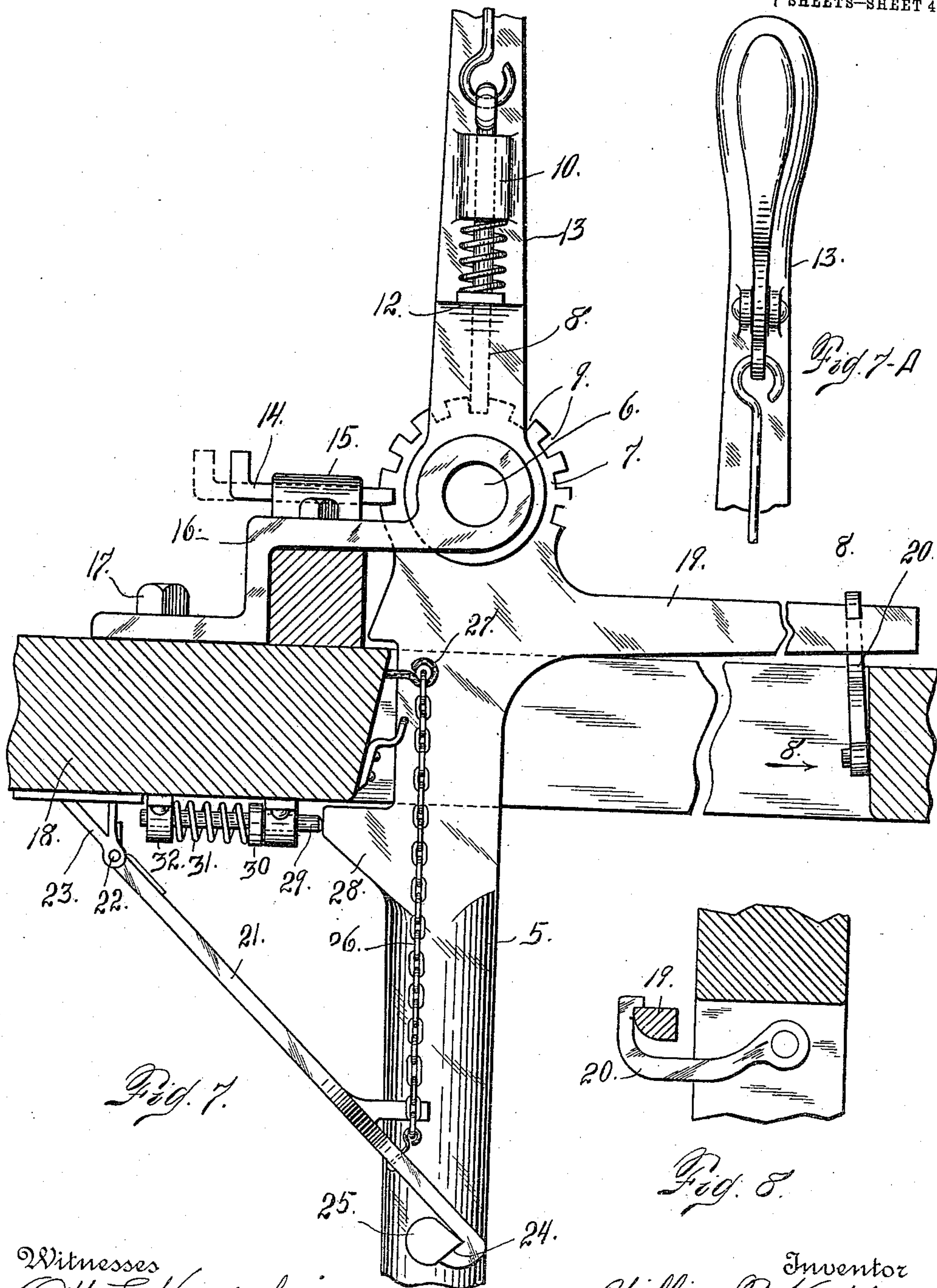
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7 SHEETS—SHEET 5.

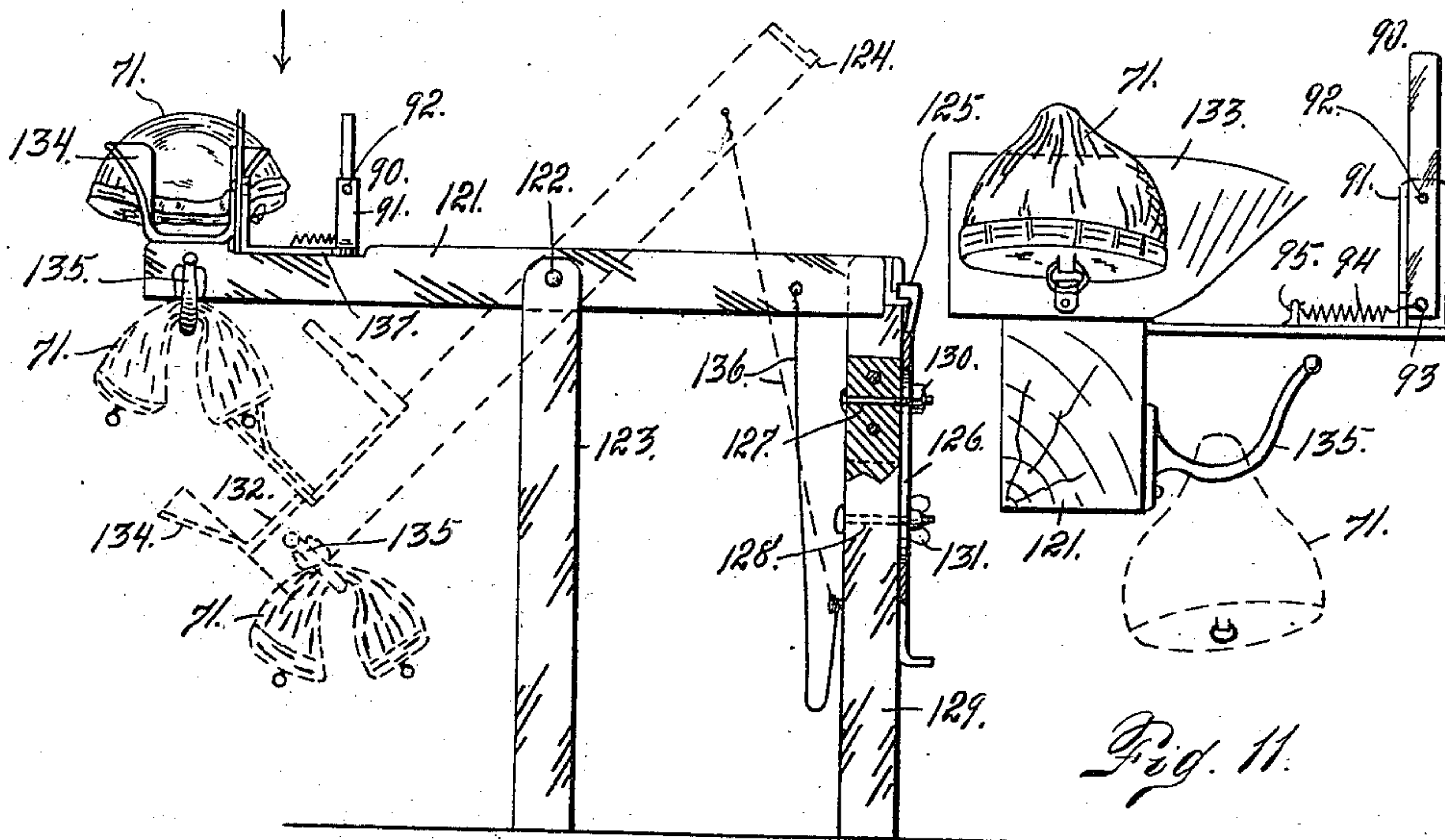


Fig. 9.

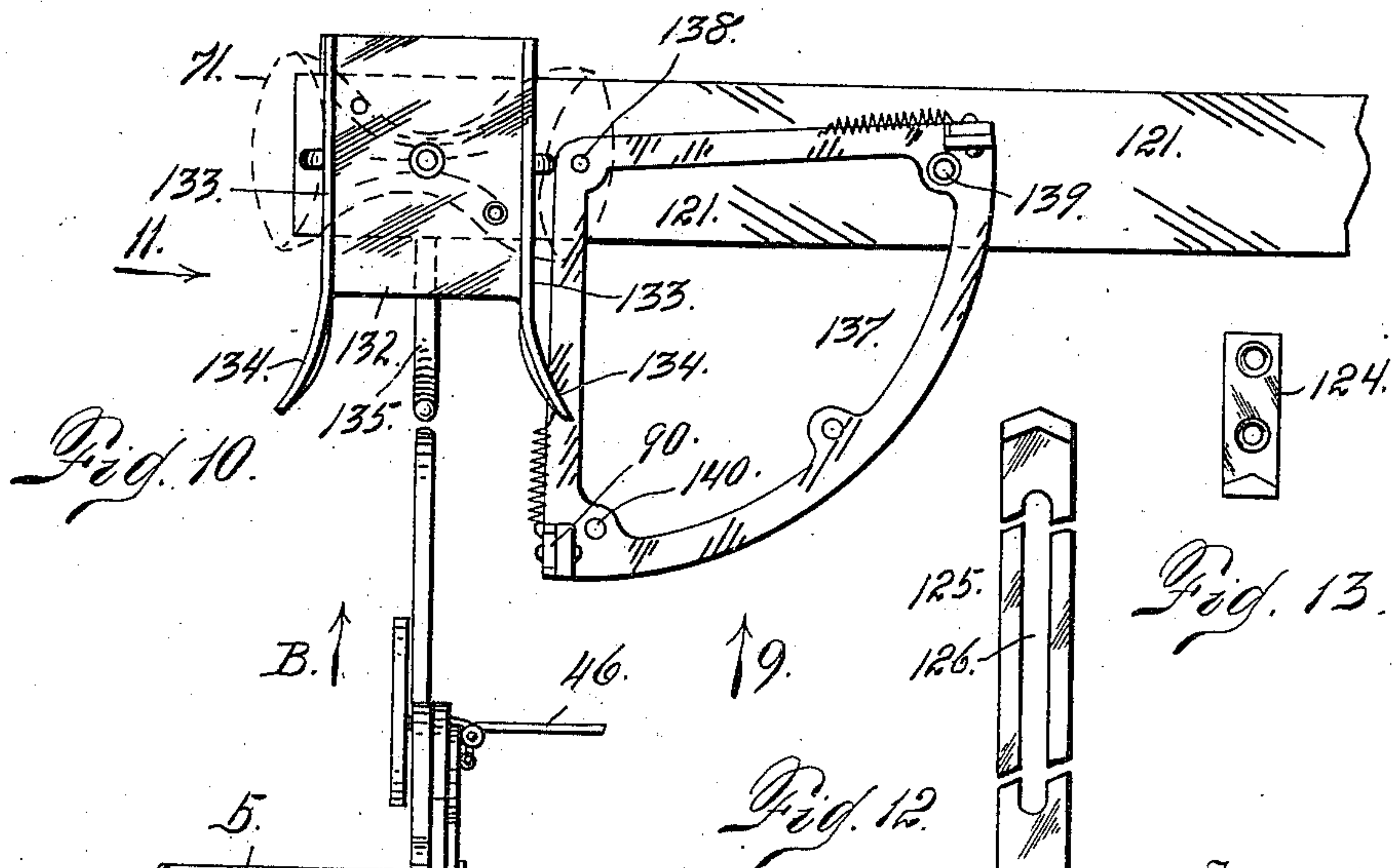


Fig. 10.

Fig. 12.

Fig. 13.

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7 SHEETS—SHEET 6.

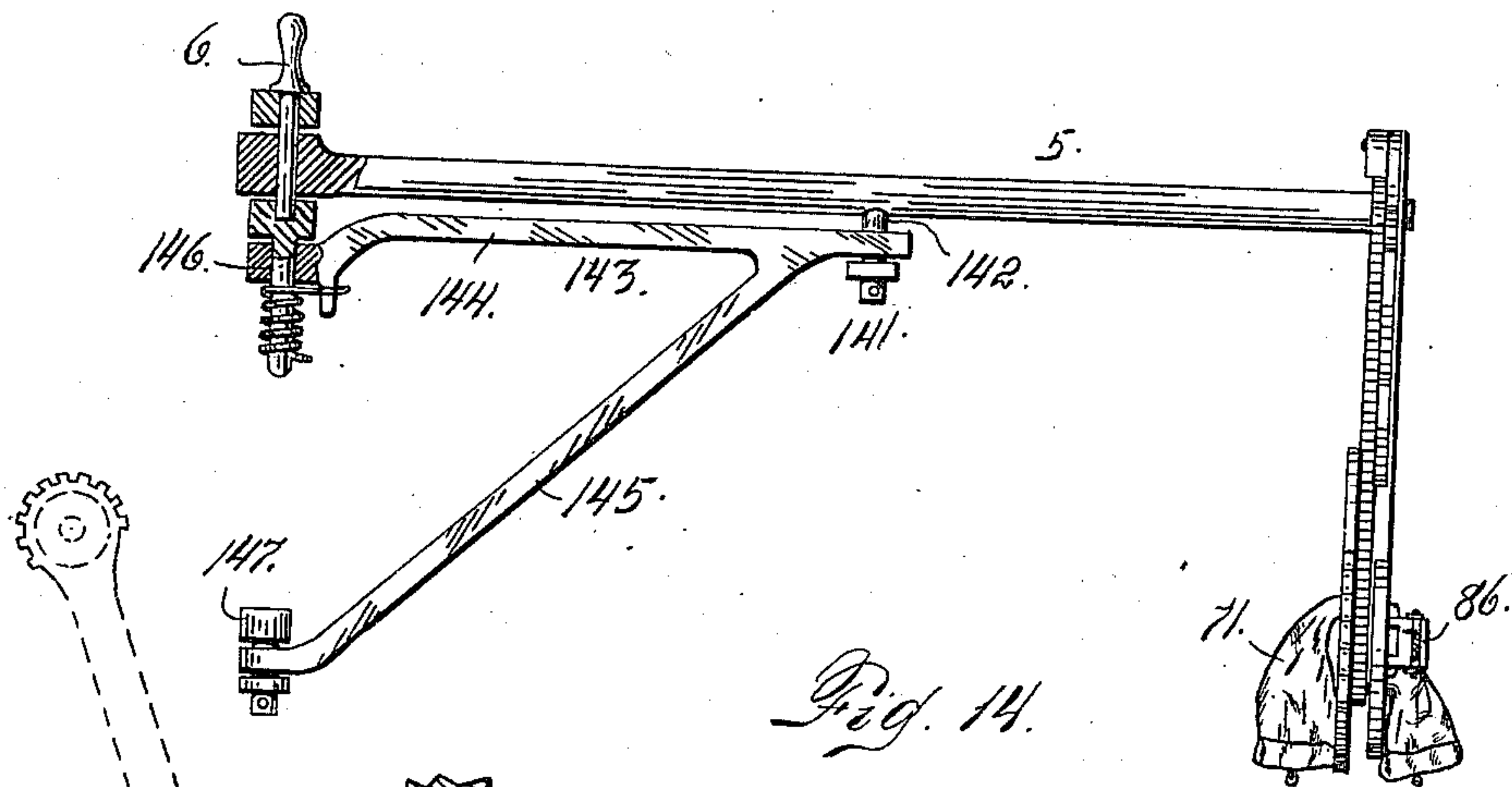


Fig. 14.

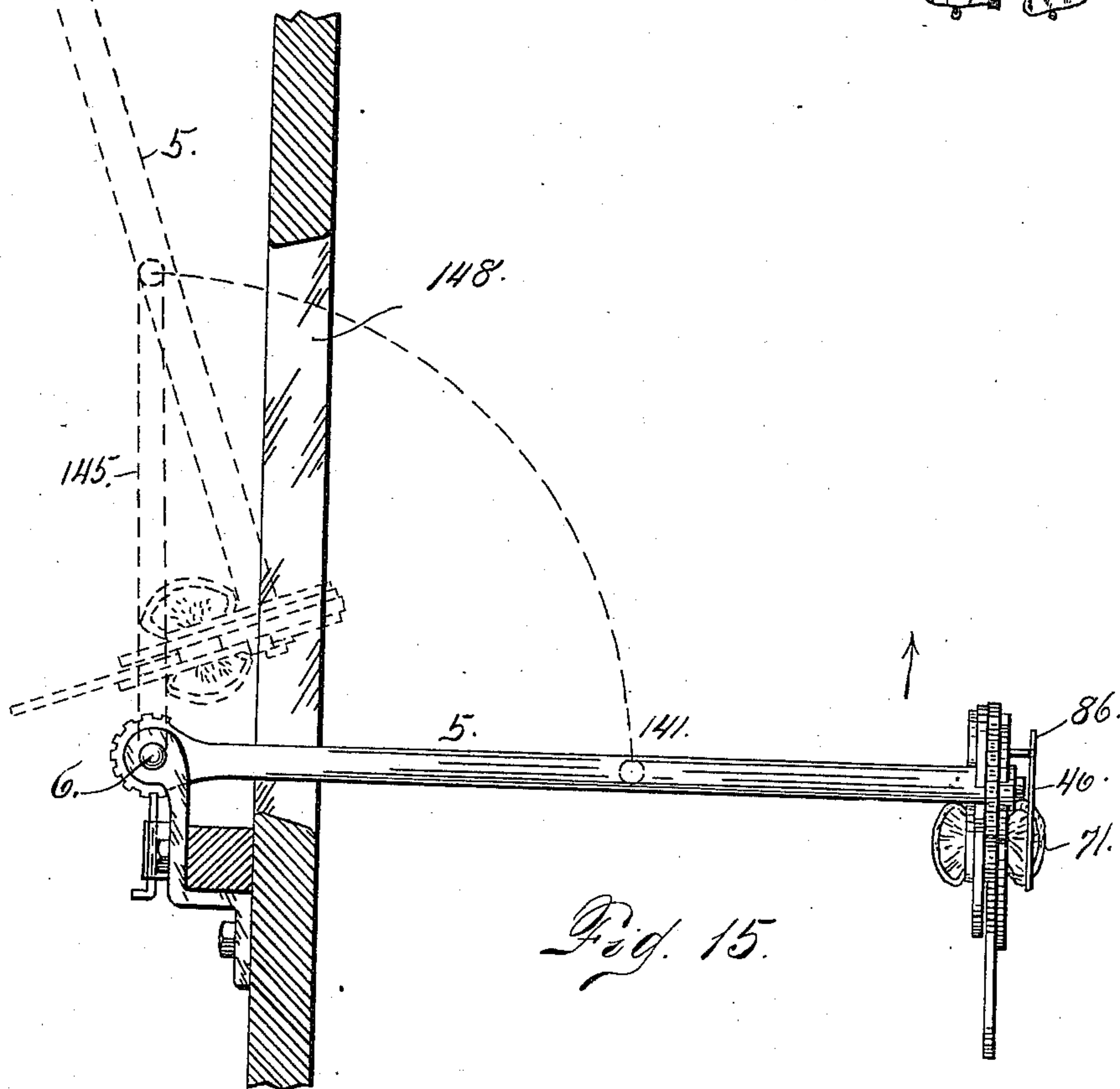


Fig. 15.

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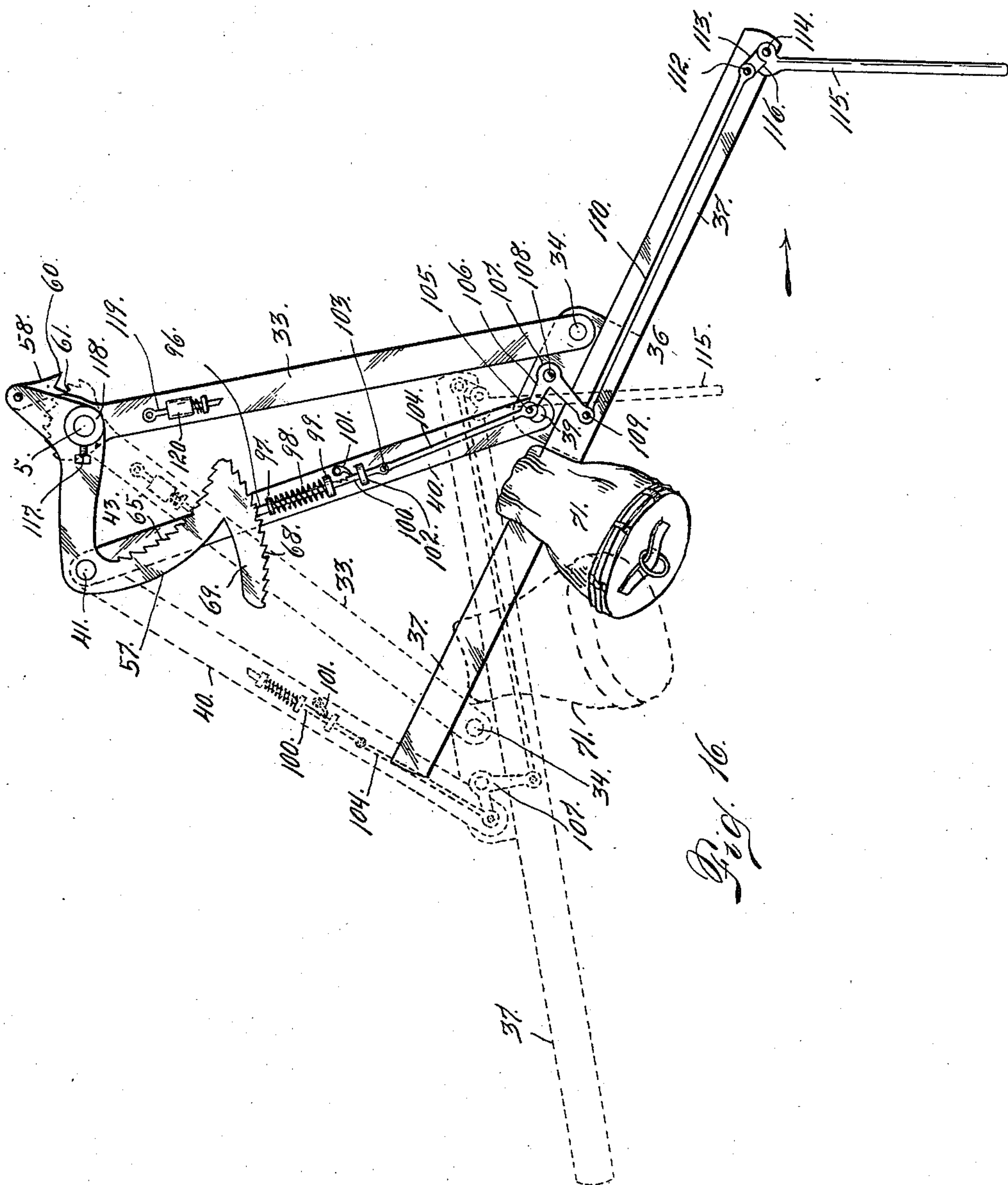
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7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

WILLIAM F. KNAPP, OF DENVER, COLORADO.

MAIL-POUCH-EXCHANGING APPARATUS.

976,374.

Specification of Letters Patent.

Patented Nov. 22, 1910.

Application filed November 22, 1909. Serial No. 529,447.

To all whom it may concern:

Be it known that I, WILLIAM F. KNAPP, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Mail-Pouch-Exchanging Apparatus; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in mail pouch exchanging apparatus.

In my improved construction a single arm or member is employed to perform both the mail pouch catching and mail pouch delivering function. This arm is pivotally mounted on and supported by two hangers, the opposite extremities of these hangers being pivotally connected by a bracket, the upper extremities of the hangers being spaced apart somewhat farther than their lower extremities, whereby the mail catching and delivering arm is adapted to assume an inclined position alternating in opposite directions, whereby as one extremity of the arm picks up or catches the pouch, the position of the arm is changed, whereby its catching end is raised to maintain the pouch in position thereon, while its delivering extremity is lowered to allow the pouch to slide therefrom, while the train is passing a mail station.

The apparatus is supported by a bar which is pivotally mounted within the car and arranged to be manipulated, whereby the catching and delivery apparatus may be swung out of the car for the purpose of delivering and catching a pouch and then readily returned to the car with the pouch which has been picked up, while the train passes a station without stopping and at any desired rate of speed.

My improved device is exceedingly simple in construction compared with the work which is performed and the invention includes, in addition to the apparatus heretofore mentioned, suitable apparatus located at the various stations along the line, for re-

ceiving and delivering mail pouches. This apparatus is arranged to support a mail pouch in such position that it may be picked up by the catching arm of the apparatus carried by the car, simultaneously with the delivery of a pouch to a hook mounted upon the apparatus at the station.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a side elevation of my improved catching and delivering apparatus carried by the car, the same being shown in position immediately after it has been swung out of the car, a mail pouch being shown supported upon the rear or delivery arm, while the forward or catching arm is in position to pick up a pouch at a station. Fig. 2 is a top plan view of the same. Fig. 3 is a view similar to Fig. 1, but viewed from the opposite side. Fig. 4 is a view of the same apparatus, with the parts shown in different relative positions, the mail pouch picked up at the station being shown in place on the forward arm, while the rear arm is empty, the mail pouch having slipped therefrom by virtue of the change in position of the parts, due to the release of the locking device. Fig. 5 is a top view of a detail of the construction shown in Fig. 4, the parts being shown on a much larger scale. Fig. 6 is a fragmentary detail view of the construction shown in Fig. 5. This view is obtained by looking in the direction of arrow 6 in Fig. 5. Fig. 7 is an enlarged fragmentary top plan view of the portion of the device located within the car, the arm carrying the catching and delivering apparatus, though protruding from the car, being broken away. Fig. 7^A shows part broken from top of Fig. 7. Fig. 8 is a vertical section taken on the line 8—8, Fig. 7. Fig. 9 is a side elevation of the station crane or means for supporting and receiving pouches. Fig. 10 is a top plan view of the same. Fig. 11 is an end view or a view looking in the direction of arrow 11, Fig. 10. Fig. 12 is a detail view of a spring-pawl, forming a part of the mail crane construction. Fig. 13 is a similar view of a cooperating member adapted to be connected

with the extremity of the crane arm. Fig. 14 is an elevation partly in section, showing a modified form of bar for supporting the catching and delivering apparatus carried by the car, together with a swinging bracket. Fig. 15 is a top plan view of the same, showing the wall of the car in horizontal section, cutting the opening in the side of the car, through which the catching and delivering apparatus is passed. Fig. 16 is a side elevation showing a modified form of construction for the catching and delivering apparatus, the same being shown in two positions, one in full lines and the other in dotted lines.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a bar pivoted within the car as shown at 6, where the bar is equipped with a toothed hub 7, adapted to receive a locking pawl 8, normally arranged to enter the recesses 9 between the teeth of the hub, whereby the bar is locked in the desired position of adjustment. This pawl is slidably mounted in bearings 10 and 12, carried by a lever arm 13, the same being located within the car for the convenience of the operator or postal clerk. The lever arm 13 is mounted on the pin or journal 6, independently of the hub 7 and is adjustable on the journal without moving the hub and the bar 5, when the pawl 8 is released from the hub's periphery. In addition to the pawl 8, the hub 7 is further locked in the desired position of adjustment by means of a locking device 14, slidable in a guide 15, mounted upon a bracket 16, secured to the side 18 of the car by a bolt 17. The bar is provided with an arm 19 engaged by a hook 20, when the bar projects through the door of the car (see Fig. 7) for mail pouch catching and delivering purposes. This hook engages the inner edge of the arm 19 and prevents the turning of the bar 5 to return it to the car, until the hook has been released from the arm 19. The bar 5 is further supported in the protruding position by a brace 21 pivoted, as shown at 22, to a bracket 23, secured to the outer wall of the car. This brace has a hook-shaped extremity 24 which is adapted to engage a stop 25 carried by the bar 5. This brace is further connected by means of a chain 26 with a hook 27, attached to the side of the car, and projecting into the opening through which the bar 5 passes. This bar is provided with a lug 28, which bears against a spring-actuated pin 29, provided with a stop-collar 30 engaged by one extremity of a spiral spring 31, the opposite extremity of the spring engaging a bearing 32 through which the pin passes.

The outer extremity of the bar 5 forms a support for the mail pouch catching and

delivering apparatus, which will now be described. Loosely mounted upon the extremity of the bar 5 is a hanger 33, whose lower extremity is pivotally connected, as shown at 34, with a centrally located plate 35, mounted upon the catching and delivering arm 36 having members 37 extending in opposite directions from the said plate. Also pivotally connected with this plate, as shown at 39, is a second hanger 40, whose upper extremity is pivotally connected, as shown at 41, with the upper member 42 of a Z-shaped bracket 43. The arm 42 is also pivotally connected with the outer extremity of the bar 5, the upper extremities of the hangers 33 and 40 being spaced or separated to a greater degree than their lower extremities, whereby the catching and delivering arm 36 is permitted to change its inclination every time the pouch catching or picking up function, is performed.

Mounted on the plate 35 and secured thereto by a bolt 44 and a nut 44^A, is a disk 45, upon which is mounted a finger 46, which when in position to perform its function occupies a position at right angles to the disk and in a plane tangential to the periphery of the latter. This finger 46 has a spring hinge connection 47 with an angle plate 48, composed of two arms 86 and 87, forming a right-angle approximately at the axis of the hinge 47. The outer extremity of the arm 87 of this angle-plate has a spring hinge connection 88 with the disk 45.

The finger 46 has a right-angled projection 89 which engages the member 87 of the angle plate, thus locking the finger against movement in the direction of arrow A, Fig. 5, the spring of the hinge 47 having a tendency to hold the finger in the full line position in Fig. 5. The finger, however, may be thrown toward the left, or to the dotted line position in Fig. 5, to facilitate the removal of the device from the car in order to cause it to occupy less compass. When, however, the train reaches a station, this finger 46 is brought into engagement with a lever arm 90 fulcrumed on a stationary part 91, as shown at 92, and connected at its lower extremity, as shown at 93, with one extremity of a spring 94, the opposite extremity of the spring being connected with a stationary part, as shown at 95. This engagement operates the finger 46 to throw it to the position shown by dotted lines in Fig. 5, whereby the member 48 is disengaged from the hanger arm 33, whereby the mechanism is allowed to assume the position shown in Fig. 4. This explanation is based on the assumption that the original position of the device is that shown in Fig. 1 and that the train is traveling in the direction of the arrow C in the last named figure.

Upon the bar 5, adjacent its outer ex-

5 tremity, is mounted and made fast a disk 49, having teeth 50 adapted to be engaged by a pawl-arm 51, pivotally connected, as shown at 52, with an upward projection 53 of the Z-shaped bracket; the opposite ex-
 10 tremity of this pawl-arm is pivotally connected, as shown at 54, with a pin 55, slidably mounted in a bearing 56 mounted on a bar 57 of the bracket 43. The pawl-arm is provided with an upwardly curved portion 58^A, at one extremity of which is an offset 59, adapted to engage one of the teeth 50 of the disk 49. By virtue of this construc-
 15 tion the bracket 43 is normally locked against movement on the manipulating bar 5.

During the movement of the mechanism from the position shown in Fig. 1 to the position shown in Fig. 4, the upper extremi-
 20 ties of the hanger arms 33 and 40 turn on the bar 5 and the pivot 41, respectively, but the bracket 43 maintains its relation unchanged, with reference to the bar 5. In order to prevent further travel of the arms 33 and 40 after they have reached the posi-
 25 tion shown in Fig. 4, two devices are illustrated, one being a pawl 58 pivotally mounted on a projection 53, as shown at 59, its lower extremity having teeth 60 adapted to engage notches or recesses 61, formed in the upper extremity of the hanger arm 33. This hanger arm is also provided with a latch 62, slidable in a bearing 63 and having its lower extremity beveled, as shown at 64, to engage
 30 teeth 65 formed on the upper edge of the member 57 of the bracket 43, when the apparatus has reached the position shown in Fig. 4. Either of these devices will perform the desired function but in order to provide
 40 a double safeguard, in the event that either should refuse to work, I have devised the construction disclosed. In the event that the movement of the mechanism should be such that the bearing 63 and its latch 62
 45 should slip past the teeth 65, the lower extremity of the pin 55 would be engaged by the said bearing or the latch and move the pin 55 sufficiently to disengage the offset 59 of the pawl-arm 58 from its tooth 50 of the disk 49. This would unlock the bracket 43 from the manipulating bar 5 and allow the whole apparatus to swing upon the said bar, thus preventing the possibility of injuring the mechanism in the event that in the oper-
 50 ation of picking up a mail pouch, the catching and delivering apparatus should be subjected to sufficient force to produce the afore-said result. When the latch 62 is not employed, as for instance when the catching
 55 and delivering mechanism is used in the reverse position, the latch is held upwardly in the inactive position by means of a pawl 66. In this event a latch 67, mounted on the hanger arm 40, engages teeth 68 formed on

the lower member 69 of the bracket 43. A 65 pawl 70 is also employed to hold the latch 67 out of engagement with the bracket, when the latch 62 is employed.

In order to fasten or secure a mail pouch 71 upon either extremity of the catching 70 and delivering arm 36, jaws 72 and 73 are employed. These jaws are pivotally connected with the plate 35 as shown at 74 and 75 and their edges are corrugated as shown at 76 and 77, to harmonize with corrugation 75 78, with which the arm 36 is provided. Each jaw, 72 and 73, has a curved member 79 toothed or recessed as shown at 80 to receive a latch 81 mounted on a plate 82, secured to the hanger arm 40. This plate is 80 provided with an offset extremity 83, with which one end of a spiral spring 84 is connected, the opposite extremity of the spring being connected as shown at 85 with the curved arm 79. Before the catching and de- 85 livering apparatus is swung out of the car upon the manipulating bar 5, a mail sack 71, to be delivered, is placed upon one of the members 37 and secured by forcing a jaw 72 or 73 down thereon, as the case may be, thus 90 preventing the possible escape of the pouch until the apparatus has changed its position, due to the release of the locking device at the station, when the mechanism will change its position and release the pouch to 95 be delivered or left at the station, automatically, due to the change in the relative position of the parts.

In the form of construction shown in Fig. 100 16, the means employed for releasing the hanger arms, as the catching and delivering apparatus passes a station, is somewhat different from that shown in the other views. In this form of construction the toothed edge 68 of the lower arm 69 of the Z-shaped 105 bracket is engaged by a spring actuated latch 96, having a stop 97 against which one extremity of a spiral spring 98 bears, while its opposite extremity engages a stationary guide 99, mounted on the hanger arm 40. 110 This latch is toothed, as shown at 100, to receive a locking pawl 101, when it is desired to hold the latch out of operative relation to the toothed edge of the bracket. The latch also passes through a second guide 115 102, its lower extremity being pivotally connected, as shown at 103, with a rod 104, whose opposite extremity is pivoted as shown at 105 to an arm 106 of a bell crank lever 107 fulcrumed at 108 and whose op- 120 posite arm is connected as shown at 109 with a rod 110 connected as shown at 112 with a link 113 whose opposite end is pivoted, as shown at 114, to a finger 115 having an off- 125 set 116 bearing against the link. This mechanism is so arranged that the finger 115, during the mail pouch picking up and delivering operation, strikes the lever arm

92 which offers sufficient resistance to move the finger to actuate the link, together with the rod 110, sufficiently to impart the necessary movement to the bell crank lever to disengage the latch 97 from the Z-shaped bracket, simultaneously with the picking up of the mail pouch, whereby the parts of the mechanism immediately assume the dotted line position in the figure, the arm 36 being shifted to reverse its inclination, whereby its forward or picking up member is raised to retain the picked up sack, while its rear or delivering member is lowered to allow the sack to be delivered to slip therefrom. As soon as the mechanism reaches the dotted line position, the pawl or dog 58 engages the teeth 61 at the upper extremity of the hanger arm 33, whereby the parts are retained in the dotted line position. In this view the Z-shaped bracket 43 is secured to the manipulating bar 5 by a set bolt 117, threaded into an opening in a hub 118 with which the said bracket is provided. When the parts are in the position shown by dotted lines in this view, a spring-actuated latch 119, mounted on the hanger arm 33 and movable in a guide 120, acts upon the toothed edge 65 of the bracket arm 57 and coöperates with the pawl 58 to lock the mechanism in the relative position shown in this figure.

The construction shown in Figs. 9, 10 and 11 and relating more particularly to the crane mechanism, or that located at the stations along the track where my improved mail pouch catching and delivering apparatus is employed on trains, will now be described. The crane or main arm 121 is fulcrumed at 122 on a post 123. The rear end of this arm is provided with a catch 124 adapted to engage a pawl 125 having a slot 126 through which bolts 127 and 128 are passed, the said bolts being inserted in openings formed in a post 129 and held in place by nuts 130 and 131. The position of the crane may be regulated at will by the adjustment of the pawl 125. By loosening the nuts this pawl may be moved up or down upon its post, thus regulating the necessary position of the rear extremity of the crane arm, when it engages said pawl. If the pawl is raised above the position shown in Fig. 9, the crane arm will be locked at an incline whereby its forward extremity or that located nearer the track or train will be lower than shown in said figure, while if the pawl is lowered, the forward extremity of the crane arm will be correspondingly elevated. This construction serves to regulate the position of the forward extremity or mail pouch supporting end of the crane arm, to cause it to harmonize with the height of the catching and delivering mechanism which may be more elevated on some cars

than upon others, thus necessitating the adjustment heretofore explained, in order that the crane may accommodate itself to cars of all heights. The forward extremity of this arm is equipped with a pouch holder, comprising a reversible bottom plate 132, having upwardly projecting sides 133 and outwardly flared projecting extremities 134, which are adapted to guide the mail pouch catching member of the catching and delivering apparatus into the space between the sides 133, whereby the catching arm may pass underneath the central part of the mail sack and pick up the same. During this operation the catching and delivering mechanism instantly changes its position as heretofore explained, whereby the picked up pouch is retained on the forward arm by virtue of its upward inclination, and the delivered pouch allowed to slip from the rear arm by virtue of its downward inclination. The crane arm is provided with a centrally located hook 135 adapted to catch the delivered pouch as it slips from the rear member of the arm 36 of the catching and delivering mechanism. The rear extremity of the crane arm is equipped with a rope or cable connection 136, to limit its movement when disengaged from the pawl-arm 125. This flexible device also affords means for returning the crane arm into locking engagement with the pawl 125.

Mounted on the crane arm 121, adjacent the pouch-supporting mechanism, is located a quadrant-shaped bracket 137, which is secured to the crane arm as shown at 138. The opposite extremities of this quadrant are each equipped with a spring-held trip lever 90. This quadrant is adjustable to bring either trip lever into position to engage the operating finger of the catching and delivering mechanism, according as the train is approaching a station in the one direction or the other. A fastening device 139 is employed to lock the quadrant in the desired position of adjustment. The said device being passed through an opening 140 formed at either extremity of the quadrant, according to the position which the latter occupies.

When the car door is so narrow that the operating bar 5 is too long to pass in and out, when swinging upon its pivot 6, this pivot is made removable and the bar is centrally pivoted, as shown at 141, on a pin 142 carried by the outer extremity of a bracket 143, having upper and lower arms 144 and 145, pivotally connected with the car as shown at 146 and 147, which reference characters designate the pivots employed in connection with the respective bracket arms. In this event the pivot 6 is readily removable, after which the inner extremity of the bar may be moved for-

wardly in the car to the dotted line position, thus drawing the supporting bracket, together with the mail catching and delivering apparatus into the car, through the narrow opening 148.

From the foregoing description the use and operation of my improved apparatus will be readily understood. Assuming that the train is traveling in the direction indicated by the arrow B in Fig. 10, the mail pouch catching and delivering apparatus is swung out of the car door into alinement with the mail pouch 71 supported on the forward extremity of the crane arm. The pouch catching and delivering mechanism, it may be assumed, is then in the position shown in Fig. 1, assuming that the train is traveling in the direction of arrow C in the last named figure. Just as the mail pouch is picked up by the forward member 37 of the arm 36, the releasing finger 46 strikes the trip lever 92, whereby the finger is thrown into position to unlock the hanger arm 33, whereby the mechanism shown in Fig. 1 is caused to assume the position shown in Fig. 4, causing the forward member of the arm 36, which now contains the picked up pouch, to be raised, with the result that the pouch is gripped between the catching arm and a jaw 73 of the catching and delivering mechanism. At the same time the delivered pouch slips from the opposite member of the arm 36, as heretofore explained. In the event that the hanger arms move sufficiently to cause the casings 63 or the latch 62, to strike the pin 55, the pawl-arm 51 is actuated sufficiently to unlock the bracket 43 from the bar 5, thus allowing the catching and delivering apparatus to rotate bodily upon the bar 5, thus preventing injury to the mechanism as might otherwise result in the event that the bracket 43 were rigidly secured to the manipulating bar 5.

In describing the operation of the mechanism, when the car is moving in the opposite direction without being turned, it will be necessary to make several adjustments. And for the purpose of this description it may be assumed that the main features of the pouch-catching and delivering device are in the relative position shown in Fig. 4. But in this view it will be assumed that the car is traveling in a direction opposite the arrow adjacent said figure. In this event the latch 62 will be disengaged from the ratchet teeth 65 and locked in the released position, being drawn upwardly and held in the inactive or inoperative position by the use of the pawl 66. At the same time the latch 67 will be unlocked by throwing out the pawl 70, whereby the latch is allowed to move upwardly into position to engage the teeth 68, when the parts of the apparatus

change their position from that shown in Fig. 4 to that shown in Fig. 1. At the same time the pawl or dog 58 will be disengaged from the teeth 61 at the upper extremity of the hanger arm 33', furthermore it will be necessary to readjust the disk 45 in order to bring the arm 86 of the angle plate 48 into locking relation with the hanger arm 40, in order to lock the devices in their normal position at the time the catching and delivering mechanism is thrust out of the car, preparatory to reaching a station. In order to adjust this disk, the nut 44^A is loosened and a locking pin A, mounted on the plate 35, is disengaged from a notch B in the said plate. The disk is then turned until a notch or recess D is in position to receive the locking pin A. This pin is then allowed to enter the recess D, after which the nut 44^A is tightened. In this event the arm 86 of the angle plate 48 and connected with the finger 46, as heretofore explained, will overlap the hanger arm 40. The mechanism will then be in position for use when moving in the reverse direction from that indicated by the arrows in Figs. 1 and 4 and the operation heretofore described will be repeated, except that no provision is made in this operation for automatically unlocking the Z-shaped bracket from the bar 5. In the operation in question, however, a buffer E mounted at the lower extremity of the arm 57 of the Z-shaped bracket, is arranged to strike the casing F of the latch 67 in order to relieve the shock or impact possibly incident to the force with which the mechanism strikes the mail pouch during the catching or picking up operation, whereby the mechanism after being unlocked by the change of position of the finger 46, suddenly shifts from the position shown in Fig. 4 to that shown in Fig. 1. It will be noted, however, that in the position shown in Fig. 1, the jaws 72 and 73 are not in the same position that they would be after the catching and delivering function has been performed, since the said jaws would be in a position the reverse of that shown in Fig. 1.

Attention is called to the fact that the springs 84, carried by the two jaws, serve as buffer springs during the pouch-picking-up operation, since the jaw which receives the impact due to the picking up act is allowed to yield temporarily by virtue of its connection with one extremity of the spring 84, while the opposite extremity of the said spring is connected with the corresponding hanger arm. The function of these springs will be best understood from Fig. 3 of the drawing which is a view showing the reverse side of the pouch catching and delivering mechanism as compared with Figs. 1 and 4. It must be understood that the jaw which acts as a buffer is disengaged from its lock-

ing latch 81, this latch being the one employed to secure the jaw in place in connection with the delivery member of the arm 36.

5 Having thus described my invention, what I claim is:

1. Mail pouch exchanging apparatus, comprising a swinging bar provided with an arm tiltably supported and having catching and delivering members respectively extending in opposite directions from the place of support.

2. Mail pouch exchanging apparatus comprising a swinging bar provided with a single reversibly tiltable arm, having pouch catching and delivering members extending respectively in opposite directions from the bar.

3. Mail pouch exchanging apparatus comprising a swinging bar, an arm carried by the bar, the arm being suspended from its central portion, reversely tiltable and having pouch catching and delivering members extending respectively in opposite directions from the place of support.

4. Mail pouch exchanging apparatus comprising a swinging bar, an arm carried by the bar, movably suspended from its central portion and reversely tiltable, whereby its members on opposite sides of the place of support alternately assume the pouch catching and delivering positions.

5. The combination of a swinging bar and an arm extending in opposite directions and tiltably suspended therefrom, to alternately assume positions of reverse inclination.

6. The combination with a swinging bar, of an arm tiltably suspended therefrom, to alternately assume positions of reverse inclination and having members extending in opposite directions from the place of suspension, whereby they alternately assume pouch holding and delivering positions.

7. The combination with a swinging bar, of an arm extending in opposite directions therefrom tiltably suspended therefrom to alternately assume positions of reverse inclination, and means for temporarily locking the arm in the inclined position.

8. The combination with a bar, of an arm tiltably suspended therefrom, to alternately assume positions of reverse inclination, means for locking the bar in either position of inclination and means for automatically releasing the locking device to allow the arm to assume a position of reverse inclination.

9. The combination with a supporting bar, of an arm tiltably suspended therefrom, extending in opposite directions from the place of support, and mounted to alternately assume positions of reverse inclination, means for automatically locking the arm in either inclined position, means for auto-

65 matically releasing the locking device to allow the bar to assume the position of reverse inclination and means for automatically locking the arm in the last named position.

10. The combination with a supporting bar, of an arm tiltably supported thereon to assume positions of reverse inclination and extending in opposite directions from the place of suspension, forming pouch catching and delivering members, and means adjustably mounted on the arm for fastening a pouch upon either member thereof, substantially as described.

11. The combination with a supporting bar, of an arm tiltably suspended from its central portion, to assume positions of reverse inclination, and jaws adjustably mounted on the arm for fastening a pouch upon either portion thereof.

12. The combination with a bar, of an arm tiltably suspended therefrom to assume positions of reverse inclination, and means adjustably mounted on the arm for fastening a pouch thereon, substantially as described.

13. The combination with a bar, of an arm tiltably suspended therefrom to assume positions of reverse inclination, the arm extending in opposite directions from the place of suspension, and jaws adjustably mounted on the arm and arranged to secure a mail pouch upon the respective members of the arm, substantially as described.

14. The combination with a bar, of a pouch catching and delivering arm, two hanger arms pivotally connected with the exchanging arm at their lower extremities, the upper extremities of the hanger arms being spaced apart, one of the hanger arms being journaled on the bar, and a spacing member fast on the bar at one extremity, the other hanger member being pivotally connected therewith, substantially as described.

15. The combination with a supporting bar, of a mail-pouch-exchanging arm and two hanger arms forming suspension means between the bar and the exchanging arm, the said hanger arms being spaced apart and pivotally connected at both extremities, and means for automatically locking the hanger arms in a predetermined position of adjustment with reference to the exchanging arm, substantially as described.

16. The combination with a supporting bar, of a mail-pouch-exchanging arm, and means for tiltably suspending the exchanging arm from the bar to assume positions of reverse inclination, said means including two hanger arms spaced apart and pivotally connected at both extremities, and means for temporarily locking the hanger arms to occupy positions corresponding with either inclined position of the exchanging arm, substantially as described.

17. The combination with a supporting bar, of a mail pouch exchanging arm and means for tiltably suspending the arm from the bar to assume positions of reverse inclination, said means including two hanger arms pivotally mounted at both extremities and unequally spaced at their opposite ends.

18. The combination with a supporting bar, of a pouch exchanging arm, means for suspending said arm from the bar to assume positions of reverse inclination, said means including two hanger arms pivotally mounted at both extremities and unequally spaced at their opposite ends, and a folding finger adjustably mounted for locking the hanger arms in positions corresponding with the reverse inclination assumed by the exchanging arm.

19. The combination with a supporting bar, a bracket mounted thereon, means for adjustably mounting the bracket upon the bar, a mail pouch exchanging arm, means for suspending the arm, comprising two hanger arms, pivotally connected at their lower extremities to the exchanging arm, their upper extremities being respectively pivoted on the bracket and the supporting bar, the opposite extremities of the two hanger arms being unequally spaced for the purpose set forth.

20. The combination with a supporting bar, of a bracket made fast thereon, a pouch exchanging arm, hanger arms connecting the pouch exchanging arm with the bar, one hanger arm being movably mounted on the bar and the other on the bracket, the opposite extremities of the two hanger arms being unequally spaced to allow the exchanging arm to swing in opposite directions to assume positions of reverse inclination, adjustable means for locking the hanger arms in positions corresponding with the reverse inclination of the exchanging arm, said locking means including a finger adapted to be tripped to release the hanger arms to allow the exchanging arm to assume its opposite inclination.

21. The combination with a supporting bar, of a bracket mounted on said bar and secured thereto, said bracket having a top arm and a curved depending arm having ratchet teeth, hanger arms pivotally connected respectively with the supporting bar and the top arm of the bracket, a pouch exchanging arm to which the lower extremities of the hanger arms are pivotally connected, the opposite extremities of the two hanger arms being unequally spaced, one edge of the curved depending bracket arm being toothed, and a spring-actuated latch mounted on one of the hanger arms and adapted to engage the ratchet teeth of the bracket when the exchanging arm has assumed one of its inclined positions.

22. The combination with a supporting bar, of a Z-shaped bracket mounted on the bar, means for securing the bracket rigidly upon the bar, the lower arms of the bracket having toothed edges, a pouch exchanging arm, hanger arms pivotally connected at their lower extremities with the exchanging arm, their upper extremities being pivotally connected with the bar and with the upper part of the Z-shaped bracket respectively, the hanger arms being unequally spaced at their opposite extremities, to permit the exchanging arm to assume positions of reverse inclination as it swings back and forth, and spring actuated latches mounted on the respective hanger arms and adapted to respectively engage the two sets of ratchet teeth with which the Z-shaped bracket is provided, whereby the hanger arms are locked in predetermined positions of adjustment with reference to the Z-shaped bracket and the exchanging arm.

23. In mail pouch exchanging apparatus, the combination with a manipulating bar having a mail pouch exchanging arm at one extremity, its opposite extremity being detachably mounted within the car, a swinging bracket mounted on the car and with which the said bar is pivotally connected at a point intermediate the extremities of the bar to permit the bar to be passed through a relatively narrow opening, substantially as described.

24. The combination with a supporting frame of a lever fulcrumed thereon, means for locking the lever in the desired position of adjustment, one extremity of the lever being equipped with a reversible plate to support a mail pouch, the mail pouch supporting end of the lever being also equipped with a hook adapted to catch a delivered pouch as the supported pouch is picked up.

25. The combination with mail-pouch-exchanging apparatus carried by a car and including a reversibly tiltable arm and a crane arm suitably mounted on a stationary support, one extremity being equipped to support a mail pouch and having a hook to receive a delivered pouch, the supported pouch being arranged in the path of the exchanging arm carried by the car for the purpose set forth.

26. The combination with a stationary support, of a crane arm fulcrumed thereon, one extremity of the arm being equipped to support a mail sack to be picked up and to receive the delivered sack from the pick-up device, and adjustable means for locking the crane arm in the desired position of adjustment, whereby the pouch supporting end of the arm may be maintained at the proper height to harmonize with the elevation of the pick-up device.

27. The combination with a supporting

bar, of a pouch exchanging arm, means for supporting the exchanging arm to allow it to assume positions of reverse inclination, said means including two hanger arms pivotally connected at both extremities, their opposite adjacent ends being unequally spaced, means for locking the exchanging arms in positions to respectively harmonize with the oppositely inclined positions of the exchanging arm, said means including a releasing finger, and a crane arm mounted on a stationary support and shaped at one extremity to support a pouch in position to be

picked up by the exchanging arm during the passing of a train, and means mounted on the crane arm for engaging the trip finger, whereby the locking device is released and the exchanging arm is allowed to swing to its position of opposite inclination, substantially as described. 15

In testimony whereof I affix my signature in presence of two witnesses. 20

WILLIAM F. KNAPP.

Witnesses:

A. J. O'BRIEN,

A. EBERT O'BRIEN.