

Feb. 24, 1953

W. H. KOCH ET AL

2,629,191

GRAVITY RETURN BUMP GATE

Filed Aug. 3, 1949

2 SHEETS—SHEET 1

Fig. 1

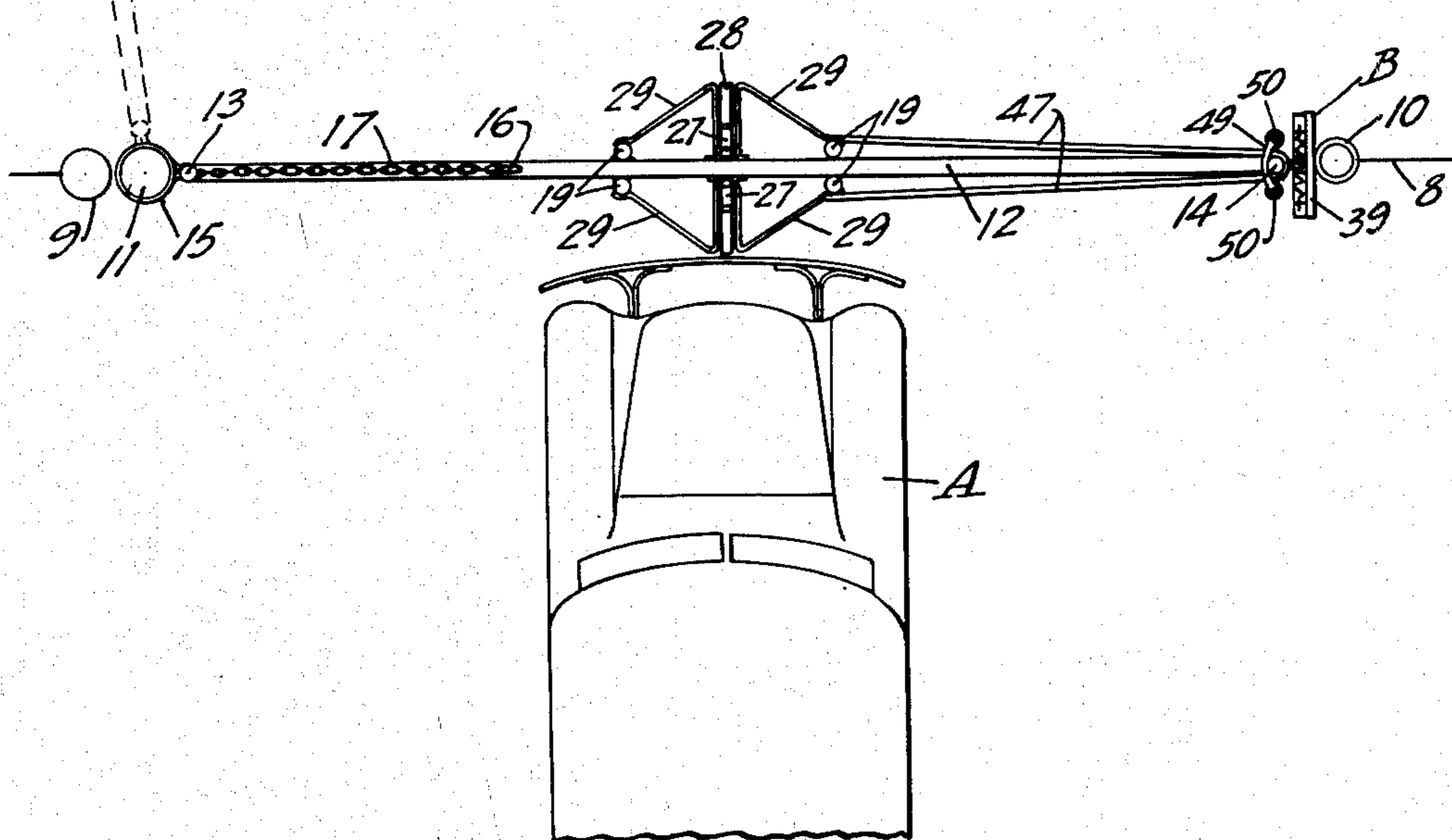
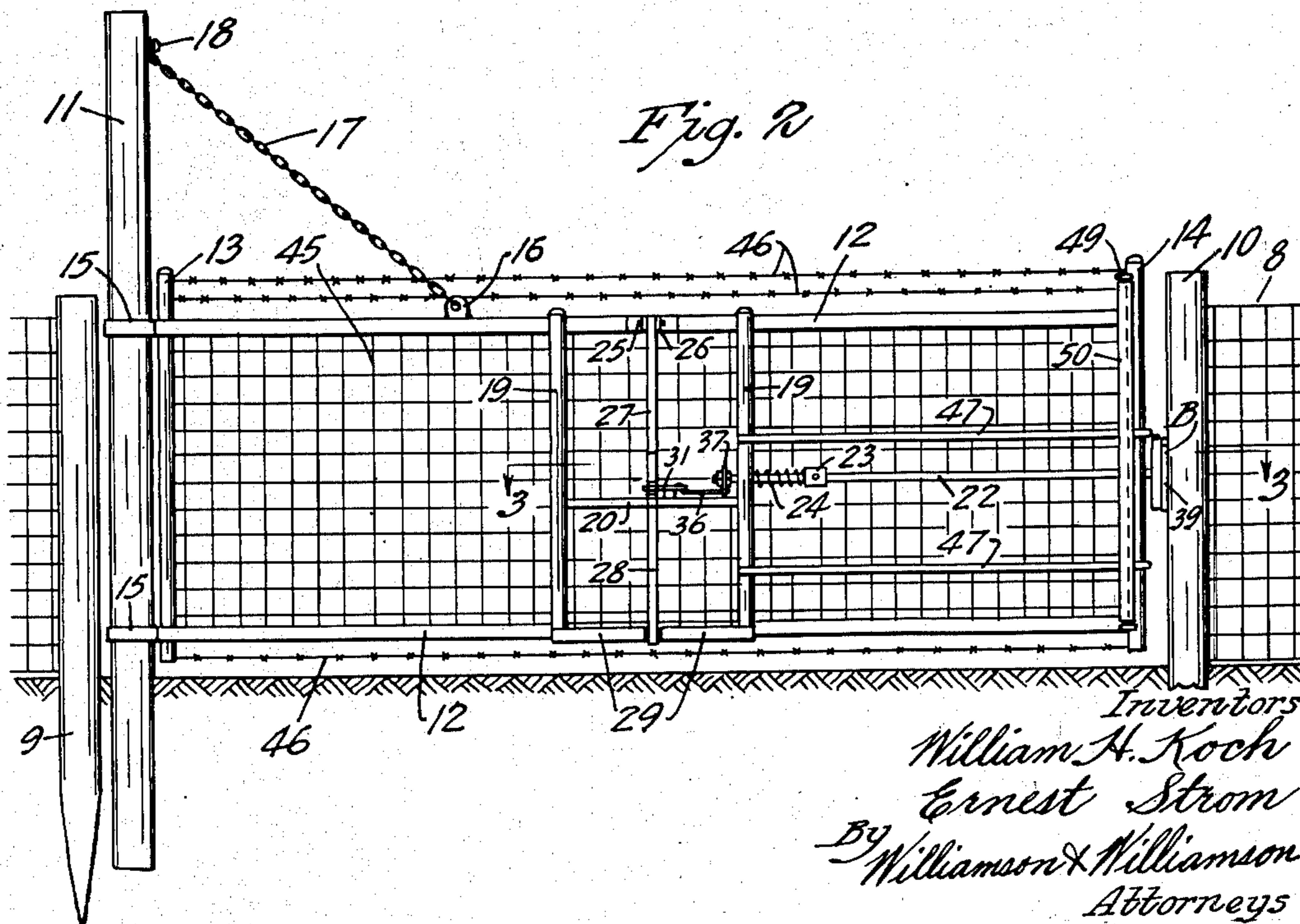


Fig. 2



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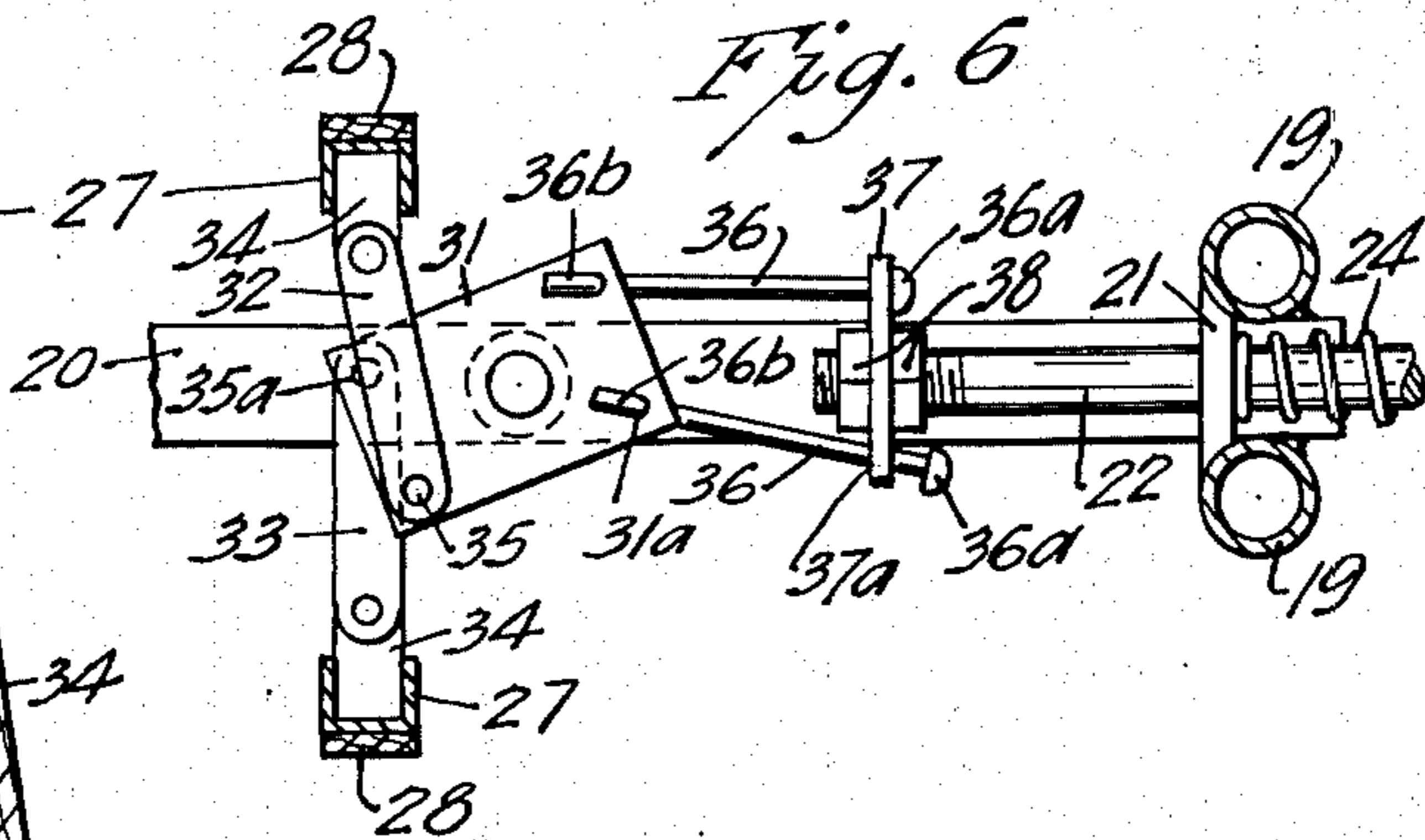
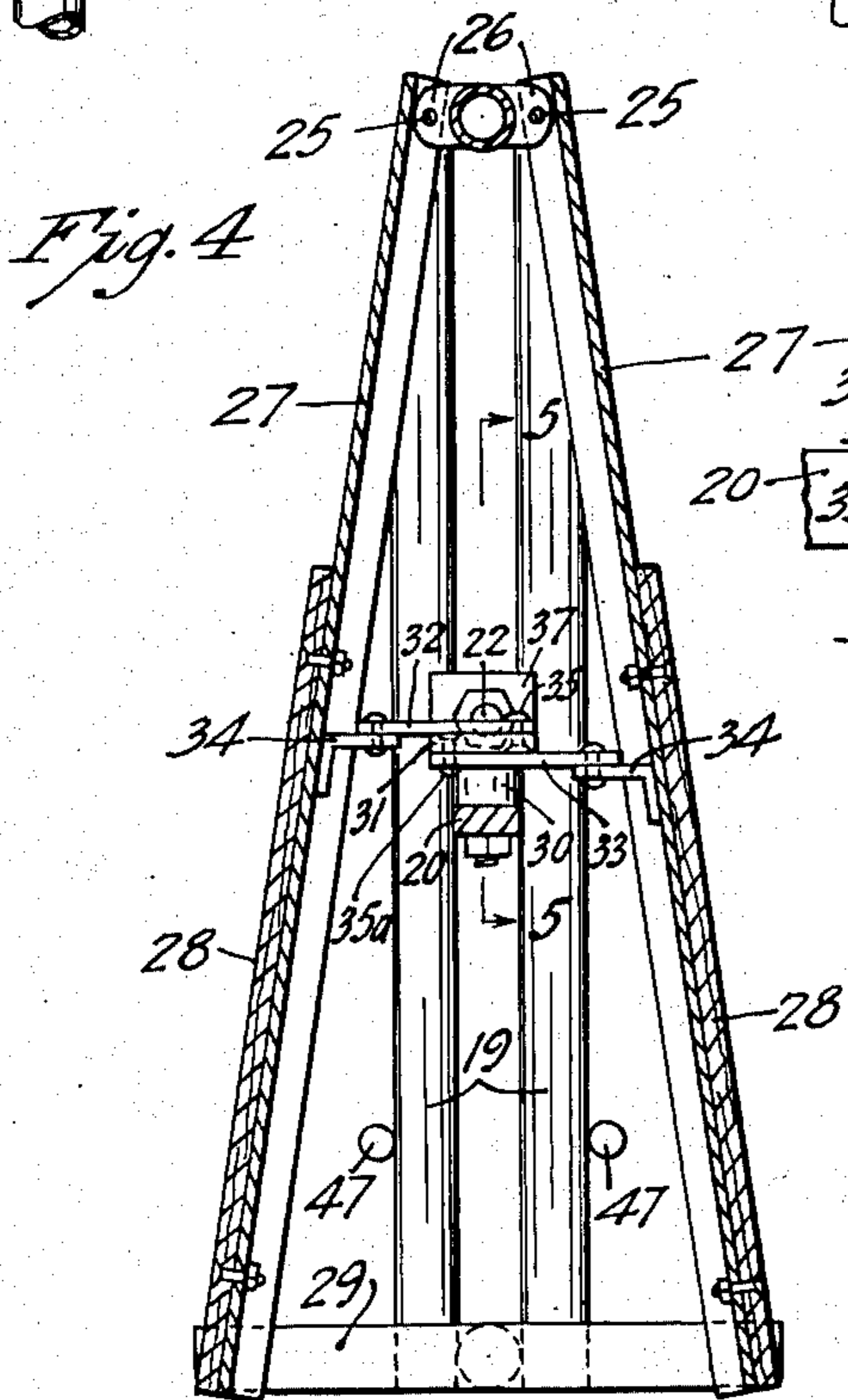
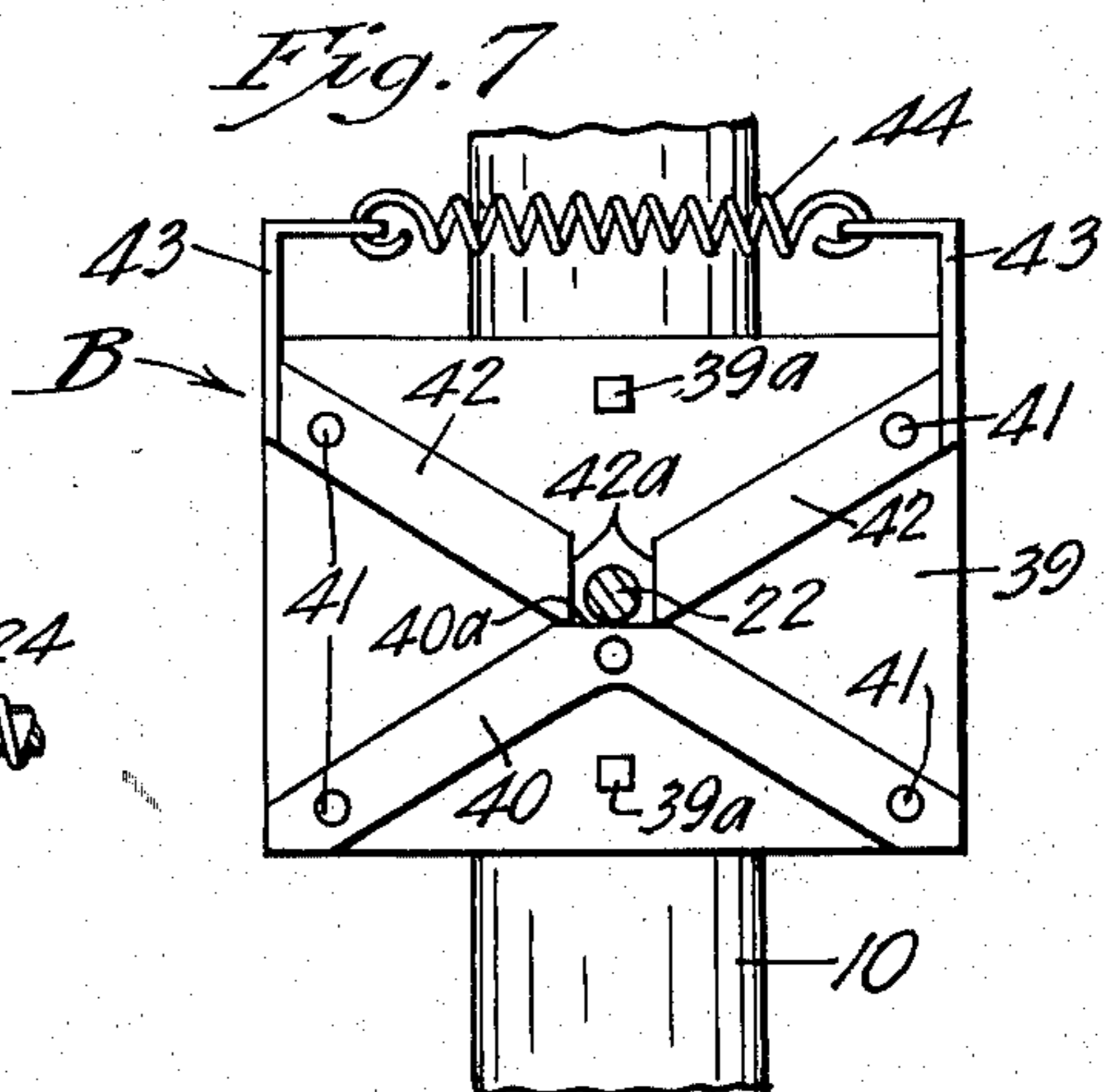
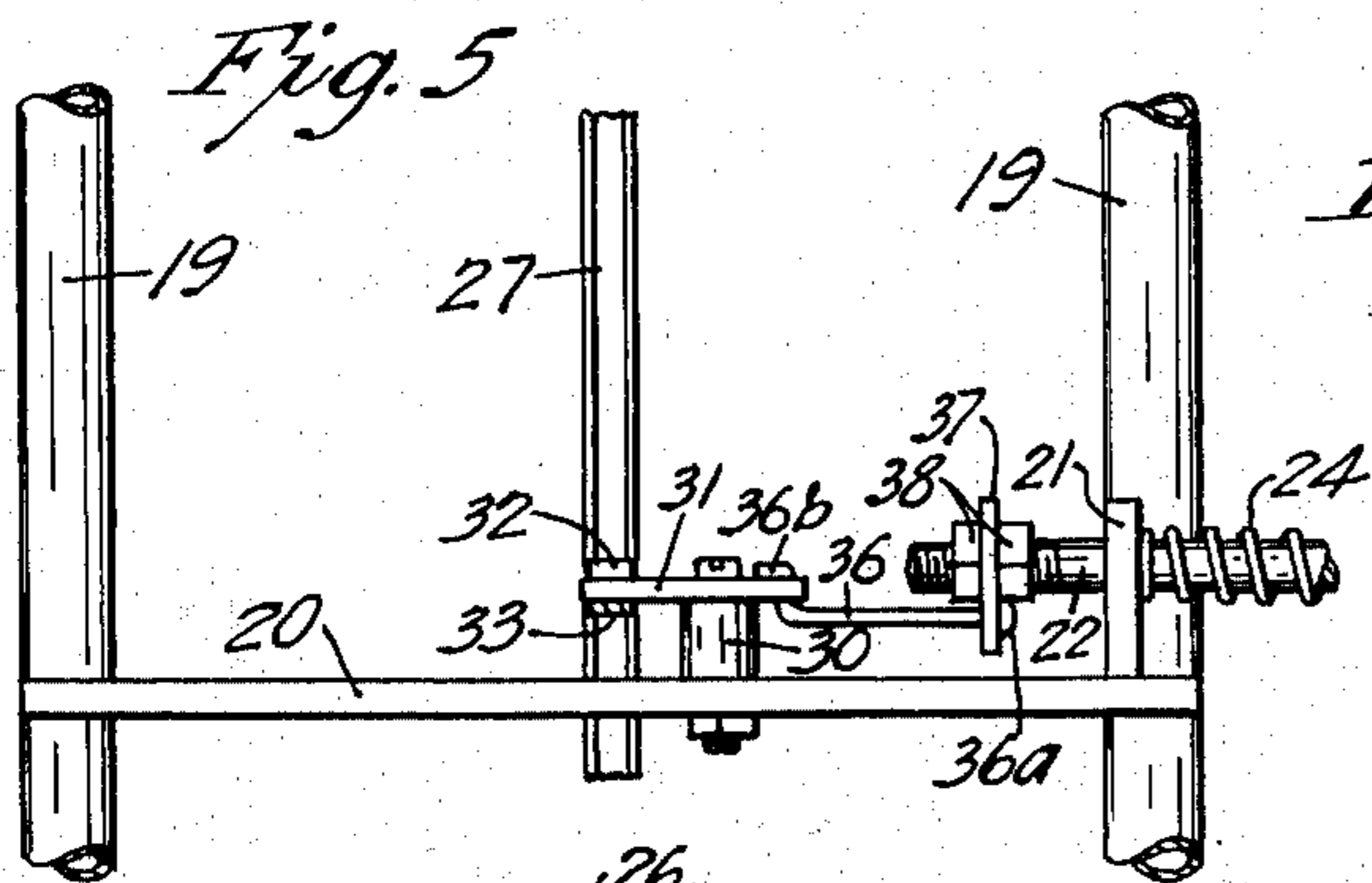
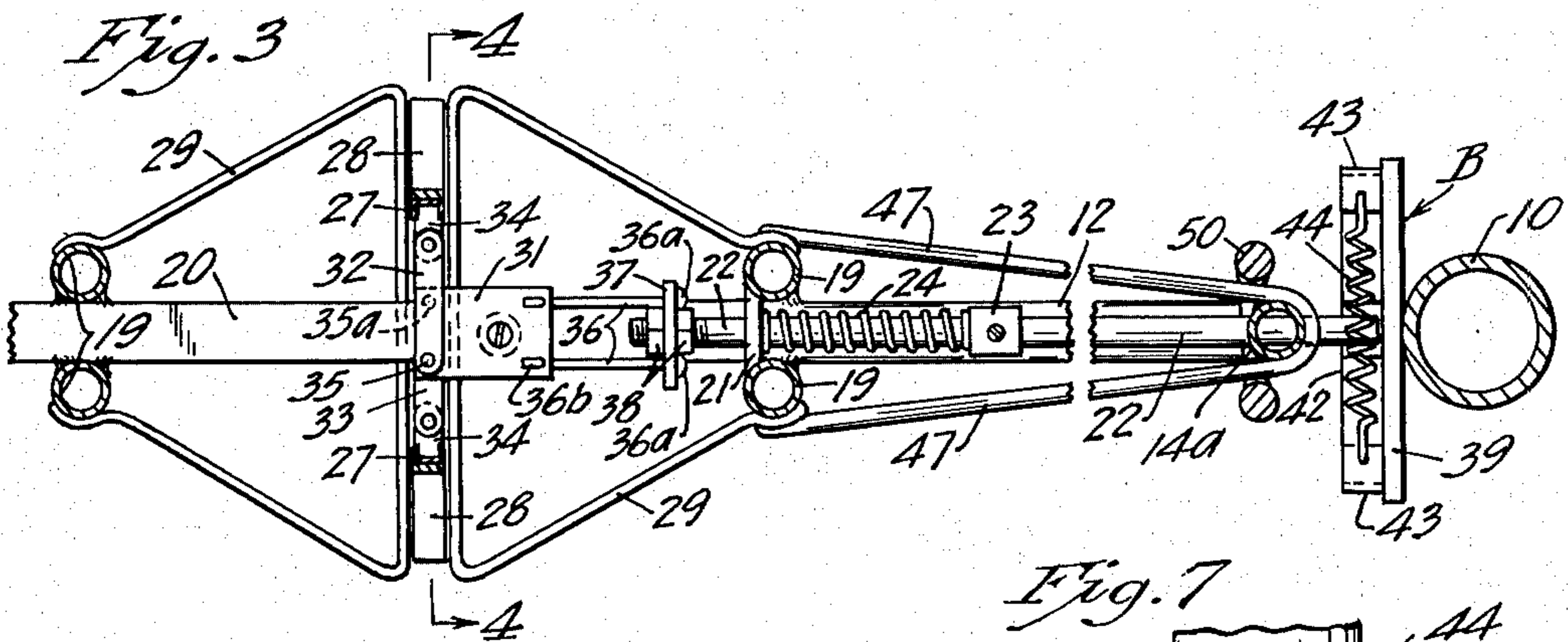
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GRAVITY RETURN BUMP GATE

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8 Claims. (Cl. 39—31)

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This invention relates to fence gates and particularly to bumper gates which can be actuated by bumping a vehicle against the gate.

It is one of the objects of the invention to provide a novel and improved bump gate of cheap and simple construction which can be employed in a fence line and which will normally be latched shut to prevent stock from passing through the fence line but which can be actuated by a vehicle through a bump imparted by the vehicle to the gate to unlatch the gate and swing the gate to an open position to permit the vehicle to pass through the fence line without necessitating the occupant of the vehicle getting out of the vehicle to operate the latching mechanism.

Another object is to provide a swinging gate suspended in a novel manner so that without the use of springs the gate when swung to an open position will return to a closed position.

Another object is to provide a bumper actuated latching mechanism for a swinging gate of novel and simple construction.

Still another object is to provide a latch keeper mechanism which will positively hold the latching member of a gate in a latching position but which after the gate has been opened through retraction of the latching member from the keeper will permit ready re-engagement of the latching member within the keeper as the gate swings to a closed position.

Still another object is to provide in such a bump gate as has been referred to a latch keeper which can be hand actuated to permit the gate to be opened for pedestrian travel through the fence line without actuation of the bumper latch control mechanism.

The objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the various views, and in which

Fig. 1 is a plan view illustrating a gate embodying the invention, the gate being shown closed in full lines and with an automobile approaching one side of the gate, and the gate being shown in dotted lines in swung open position;

Fig. 2 is a view in side elevation of the gate illustrated in Fig. 1, the gate being closed;

Fig. 3 is a horizontal section in enlarged scale taken substantially on the line 3—3 of Fig. 2 as indicated by the arrows;

Fig. 4 is a vertical section taken substantially on the line 4—4 of Fig. 3 as indicated by the arrows;

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Fig. 5 is a vertical section taken substantially on the line 5—5 of Fig. 4 as indicated by the arrows and showing certain portions of the mechanism;

Fig. 6 is a view on a still larger scale taken as in the case of Fig. 3 but showing certain of the parts in a different position than as shown in Fig. 3; and

Fig. 7 is a view in enlarged scale looking toward the left side of the latch keeper as seen in Figs. 1, 2, and 3.

Referring to the drawings, there are shown portions of a fence 8, the two ends of which are connected respectively to a fixed post 9 mounted in the ground and a latch post 10 also mounted in the ground at a point spaced from the post 9 sufficient for the convenient travel of vehicles such as the automobile A between the two posts 9 and 10. Mounted alongside the post 9 is another post 11 running to a considerably greater height than the post 9, and the post 11 is sometimes hereafter referred to as a pivot post and sometimes hereafter referred to as a gate hanging post.

There is provided a gate frame including a pair of vertically spaced horizontal bars 12 connected to a pair of spaced vertical bars 13 and 14 respectively whereby a gate frame of rectangular shape is produced. The swinging end of the gate frame may be considered to be the end where the vertical bar 14 is located, while the pivot end of the gate frame may be considered to be the end where the vertical bar 13 is located.

Connected to the pivot end of the gate frame are a pair of vertically spaced collars 15 which loosely encircle the pivot post 11 so that the gate frame may freely swing around the pivot post 11 about the central vertical axis of the post. At the same time the collars 15 will be free to ride upwardly and downwardly on the post 11 during this swinging movement. In spaced relation toward the vertical bar 14 from the vertical bar 13 an upwardly projecting lug 16 is mounted on the top horizontal bar 12 of the gate frame and connected at its lower end to this lug 16 is a chain 17 or equivalent flexible supporting member. The upper end of the chain 17 is secured as by a bolt 18 to the pivot post 11 well above the level of the gate frame and at a point eccentric to the pivotal axis about which the gate frame swings and disposed at the side of the pivot post 11 toward the latch post 10. Accordingly, the gate frame will assume its lowest position when the gate frame is located as shown in full lines Fig. 1 and as also shown in Fig. 2 with the gate frame disposed between the two posts 11

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and 10 so that the bar 14 of the gate frame is adjacent the latching post 10. In other words, this lowest position of the gate frame will be assumed when the gate frame lies in substantially the same plane as the plane within which is located the pivotal axis about which the gate frame swings and the point where the upper portion of the chain 17 is attached to the pivot post 11. It will be seen that as the gate frame is swung either clockwise or counterclockwise from this central position, as the length of the chain 17 between the lug 16 and the bolt 18 remains the same and as the point where the upper portion of the chain is attached by the bolt 18 to the pivot post 11 is eccentric of the pivotal axis about which the frame swings, the gate frame must rise vertically somewhat from its lowered central position. Accordingly, after the gate frame has been swung to an open position the collars 15 will have raised somewhat on the pivot post 11 and as the limit of the swing is reached gravity acts to tend to return the gate frame to its original central position between the two posts 10 and 11. Accordingly, the gate frame will return by gravity to its closed or central position, this closing movement being accomplished without the use of springs and without the use of a counterbalancing weight. It should be stated that the point of connection of the lower end of the chain 17 to the gate frame is such relative to the weight of the gate frame and the parts carried thereby that the suspension of the gate frame by the chain 17 and by the two collars 15 will allow for the greatest freedom of swinging movement of the gate frame without a tendency for either collar 15 to bind unduly on the pivot post 11.

Intermediate the two ends of the gate frame two pair of spaced vertical bars 19 are secured to the top and bottom horizontal bars 12 to extend therebetween. The two bars forming the pair at the left of the longitudinal central portion of the gate frame are secured one at either side of the two bars 12, while the other two bars 19 forming the pair located to the right of the longitudinal central portion of the frame are similarly secured. Accordingly, the bars at the same side of the gate frame in the two pairs oppose each other in longitudinally spaced relation, while similarly the bars at the opposite side of the frame oppose each other in longitudinally spaced relation. Intermediate the top and bottom bars 12 there is provided a central horizontal bar 20 which extends between and is secured to the four vertical bars 19, the ends of the bar 20 being located between the individual bars 19 of the two pair. This bar 20 at its right end carries an apertured upstanding lug 21 which is in alignment horizontally with an opening 14a provided in the vertical bar 14. A latching rod 22 which is horizontally disposed is slidably received within the opening in the lug 21 and in the opening 14a and the right end of this latching rod is projectable laterally of the right hand vertical bar 14 of the gate frame and it is also retractable within the outline of the said right hand bar 14. The rod 22 carries a collar 23 to the right of the lug 21 and a heavy coiled spring 24 encircles the rod 22 and bears at one end against the lug 21 and at its other end against the collar 23, thereby normally urging the rod 22 to the right as viewed in the drawings Figs. 1, 2 and 3 to project the end of the rod normally adjacent the latching post 10 outwardly from the vertical bar 14 of the frame toward the latching post.

Connected by pivots 25 to oppositely disposed

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lugs 26 welded or otherwise secured to the top bar 12 of the gate frame and located intermediate the two pair of vertical bars 19 are a pair of bumper bars 27. These bumper bars project downwardly from the top bar 12 of the gate frame to points adjacent the lower bar 12 of the frame and bolted or otherwise secured to the lower outer portions of the bumper bars 27 are strips 28 formed of wood or resilient material or other material that will not readily mar or injure such parts as the bumper of an automobile as the bumper strikes the same. Strap-like guides 29 are secured respectively to the lower ends of the respective pairs of vertical bars 19, and the central portions of these strap guides are spaced apart to form guideways for the lower ends of the two bumper bars 27 to confine them for movement transversely of the gate frame.

Mounted on a vertical pivot 30 carried by the bar 20 a little to the right of the two bumper bars 27 as shown in Figs. 2, 3, 5 and 6 of the drawings is a lever plate 31 which is horizontally disposed. A pair of links 32 and 33 respectively are pivotally connected at their outer ends to lugs 34 mounted at the inner sides of the two bumper bars 27 respectively, and one of these links, as the link 32, is located above the level of the other link 33. The link 32 at its inner end is connected by a pivot 35 to the remote side portion of one arm of the lever plate 31 from the particular bumper bar 27 to which this link 32 is also pivotally connected. Similarly, the other link 33 is connected by a pivot 35a to the remote side portion of the same arm of the lever from the particular bumper bar 27 to which the link 33 is also pivotally connected. Of course, one of the links 32 lies above the lever plate 31, while the other link 33 lies below the lever plate so that the two links will not interfere with each other. The opposite arm of the lever plate 31 from that to which the two links 32 and 33 are connected is connected to the inner end of the rod 22 by a double linkage consisting of a pair of link rods 36 and a connection plate 37 mounted on the inner end portion of the latch rod 22 and secured in place thereon by opposed jamb nuts 38. The two link rods project loosely through openings 37a in the attaching plate 37 and have heads 36a at the outer side of the plate 37 which prevent the two link rods from being drawn completely through the openings 37a in an inward direction. The inner end portions 36b of the link rods 36 are bent first upwardly to form pivots extending through openings 31a in the lever plate 31 and they are then bent inwardly above the lever plate to retain them in position. The two openings 31a in the lever plate through which the link rods 36 extend are formed in the arm of the lever plate opposite that to which the links 32 and 33 are pivotally connected, and these openings are located one adjacent each side edge of the said arm.

There is shown as being secured to the latch post 10 a latch keeper which is designated as an entirety by the letter B, this keeper being best shown in Figs. 3 and 7 of the drawings. The said keeper includes a plate 39 which may be secured to the latch post 10 as by bolts 39a or by welding, the plate being located so as to project somewhat below and above the level of the latch rod 22. Secured to the face of the keeper plate 39 facing the gate frame is an inverted V shape base member 40, the said base member having a flattened top surface 40a at approximately the level of the lower portion of the latch rod 22.

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Mounted on pivots 41 attached to the same face of the plate 39 are a pair of keeper arms 42 which project downwardly from the pivots and have outturned end portions 42a adapted to normally rest on the flattened portion 41a of the base member. When so resting on the said flattened portion the two outturned ends 42a are spaced apart a distance sufficiently greater than the diameter of the latch rod 22 that if the latch rod is carried against one of the two end portions 42a of one of the keeper arms 42 the lower portion of the other keeper arm may be swung upwardly to clear the projecting end of the latch rod 22. Attached to the upper portions of the keeper arms 41 are angular handles 43 to the inner ends of which the ends of a light tension spring 44 are connected. While gravity will normally hold the lower outturned end portions of the keeper arms 42 in position resting on the flattened portion 40a of the base member 40, the spring 44 urges the two keeper arms 42 to this position. It will be understood that the outer end of the latch rod 22 when projected outwardly beyond the vertical bar 14 at the swinging end of the gate frame is of sufficient length to be received over the flattened portion 40a of the base member of the keeper, when the gate frame has been swung to the proper position, to normally be disposed between the two outturned ends 42a of the keeper arms 42. The inclined upper edges of the base member 40 will guide the latch rod into this position and it will be appreciated that as the gate frame approaches its central position it will strike the lower surface of one of the two keeper arms 42, thereby raising that particular keeper arm to allow the projecting end of the latch rod to pass below it to the central point shown in Fig. 7.

The gate frame formed by the horizontal bars 12 and the vertical bars 13 and 14 will have suitable vertical and cross fence wire 45 attached thereto to prevent the penetration of animals through the gate frame. If desired, upper and lower lines of barbed wire 46 may be strung between the upper and lower end portions of the two vertical bars 13 and 14. There are fixed to the right hand vertical bars 19 and to the vertical bar 14 at the swinging end of the gate frame at least two levels U-shaped guards 47 which are employed to prevent the fence wires 45 of the gate or other parts thereof from catching and tangling with the front portion of a vehicle as the gate swings relative to the vehicle either on a swinging movement away from the vehicle or toward it. Also carried by the vertical bar 14 at the swinging end of the gate are upper and lower roller brackets 49 which project outwardly at the two sides of the gate and have journaled therein trunnion equipped rollers 50. These rollers 50 are located outwardly from the guards 47 and are for the purpose of permitting the swinging end portion of the gate to roll freely over such a part as a bumper of an automobile or the like.

The gate having been mounted as described between a pivot post 11 and a latch post 10 in a fence line, the gate, of course, will normally extend in a central position bridging the space between the two posts, the projecting outer end of the latch rod 22 being received between the two outturned ends 42a of the keeper arms 42 so that the gate will be locked to prevent livestock from passing through the opening in the fence line. When it is desired to drive a vehicle such as the automobile A through the fence line

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the automobile is driven directly against the central portion of the gate, whereupon the forward portion of the vehicle, usually the bumper, will strike the particular bumper bar 27 at the particular side of the gate toward which the vehicle approaches. As one of the bumper bars 27 is struck and bumped by the vehicle, the lower portion of this bumper bar will be swung inwardly relative to the gate frame, whereby through whichever one of the two links 32 or 33 is connected to that particular bumper bar the lever plate 31 will be swung and one of the two link rods 36 will be swung inwardly as from the position shown in Fig. 3 to the position shown in Fig. 6. Thereby, the latch rod 22 will be slid inwardly to retract the portion of the same projecting beyond the vertical bar 49 inwardly to withdraw it from between the two projecting end portions 42a of the two keeper arms 42. This releases the latch rod from the keeper and permits the gate to freely swing open in the direction of travel of the vehicle. While the gate is swung to a wide open position the vehicle is driven through the opening in the fence line between the two posts 10 and 11 beyond a point which will clear the gate during its return swing. The gate will be swung back by gravity to its central position bridging the two posts 11 and 10 as has been previously described, and as the gate swings back the latch rod which has returned to its original projected position will be engaged between the two keeper arms 42 as has been previously described, thereby relatching the gate. The spring 24 is heavy enough so that even if a cow or horse should strike one of the bumper bars 27 the gate will not be unlatched. It will take quite a sharp blow from the vehicle to produce the unlatching action.

It should be noted that due to the cross connection of the two links 32 and 33 to opposite portions of the lever arm of the lever plate 31 the lever plate will be given a considerable arcuate movement as one of the bumper bars 27 is actuated without throwing the various pivots connecting the links to the bumper bars and to the lever plate greatly out of alignment.

After one or two experiences in connection with the gate the driver of the vehicle will soon learn at what speed he should drive his vehicle in order to unlatch the gate to swing it sufficiently wide open to clear the vehicle and allow the vehicle time enough to pass beyond the reach of the gate on its return movement without the gate striking the vehicle during its return movement. The guards 47 and the roller 50 will act to prevent injury to any parts of the vehicle or catching of any parts of the vehicle on the gate if for any reason the gate is not swung open violently enough to prevent portions of the forward end of the vehicle from brushing against the gate after one of the bumper bars 27 has first been struck.

For pedestrian use of the gate, it is desirable that it be possible to open the gate without actuating one of the two bumper bars 27. The latching mechanism can be disengaged readily by a pedestrian by the pedestrian's grasping one of the two handles 43 and swinging the handle downwardly, thereby swinging the lower portion of one of the keeper arms 42 upwardly, whereupon the gate may be pushed open.

It will be seen that a highly effective bump gate of cheap and simple construction has been provided.

It will, of course, be understood that various

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changes may be made in the form, details arrangement, and proportions of the various parts without departure from the scope of the present invention which, generally stated, consists in the matter, shown, and described, and set forth in the appended claims.

What is claimed is:

1. A bumper actuated latch for use in conjunction with a gate frame having a pivot end and a swinging end mounted between a pivot post and a latch post for swinging movement of the gate frame about the pivot post to open and closed positions, said latch including a bumper bar pivotally connected on a substantially horizontal axis to said frame and projecting vertically from its pivotal mounting at one side of the gate frame and in spaced relation thereto intermediate the ends of the frame in position to be struck by a vehicle driven to pass between the two posts, a latch member mounted on the gate frame for extension and retraction of a portion thereof from the swinging end of the frame, a latchkeeper companion to and engageable by the latch member for cooperative retaining action with said latch member when the latter is extended, resilient means urging said latch member to its extended position, a lever in the gate frame pivotally mounted intermediate its length for swinging movement about a vertical axis, a link pivotally connecting said bumper bar to one end portion of said lever, and a linkage between the other end portion of said lever and said latch member retracting said latch member from said keeper as said lever is swung in one direction.

2. The structure defined in claim 1, said keeper comprising a base over which the end of said latch member projecting from the swinging end of the gate frame may travel and a pair of arms pivotally mounted above said base, one at either side of the central portion thereof, said arms being adapted to receive the projecting end of the latch member therebetween and there being sufficient clearance between said two arms when resting on said base to permit either arm to be swung upwardly to clear the latch member, thereby permitting swinging of the gate frame without actuating one of said bumper bars.

3. A bumper actuated latch for use in conjunction with a gate frame having a pivot end and a swinging end mounted between a pivot post and a latch post for swinging movement of the gate frame about the pivot post, said latch including a pair of bumper bars pivotally connected on a substantially horizontal axis to the gate frame and respectively projecting vertically at the two sides of the gate frame centrally of the two ends thereof in position such that one of the bumper bars will be struck by a vehicle driven in either direction to pass between the two posts, a latch member mounted on the gate frame for extension and retraction of a portion thereof from the swinging end of the frame, resilient means urging said latch member to extended position, a latchkeeper adapted to be mounted on the latch post for receiving the latch member when extended, a lever pivotally mounted on said frame between said bumper bars, a pair of links respectively pivotally connected with the respective bumper bars and also pivotally connected to said lever, and a linkage between said lever and said latch member retracting said latch member against the tension of said resilient means as said lever is actuated by inward

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movement of one of said bumper bars toward said frame.

4. The structure defined in claim 3 and guides mounted adjacent said bumper bars guiding the travel of said bumper bars in a direction transverse to said frame and preventing deformation of said bumper bars which would otherwise take place as a result of said bumper bars becoming entangled with portions of the bumper of the vehicle.

5. A bumper actuated latch for use in conjunction with a gate frame having a pivot end and a swinging end mounted between a pivot post and a latch post for swinging movement of the gate frame about the pivot post, said latch including a pair of bumper bars pivotally connected at their upper ends on a substantially horizontal axis to the gate frame and respectively projecting downwardly at the two opposite sides of the gate frame intermediate the two ends thereof in position such that one of the bumper bars will be struck by a vehicle driven in either direction to pass between the two posts, a latch rod slidably mounted in horizontal relation on the frame for extension and retraction of an outer end portion thereof from the swinging end of the frame, resilient means urging said latch member to the extended position, a latch keeper adapted to be mounted on the latch post to receive the outer end portion of said latch rod when extended, a single lever mounted for swinging movement about a vertical pivot on the gate frame between the two bumper bars, links respectively pivotally connected at their outer ends to the respective bumper bars and extending toward each other and having their inner ends pivoted to the inner end portion of said lever, and a linkage between opposite side portions of the outer end of said lever and said latch rod for retracting said latch rod against the tension of said resilient means as either one of said bumper bars is swung inwardly relative to said frame.

6. A bumper actuated latch for use in conjunction with a gate frame having a pivot end and a swinging end mounted between a pivot post and a latch post for swinging movement of the gate frame about the pivot post, said latch including a pair of bumper bars pivotally connected at their upper ends on a substantially horizontal axis to the gate frame and respectively projecting downwardly at the two sides of the gate frame intermediate the two ends thereof in position such that one of the bumper bars will be struck by a vehicle driven in either direction to pass between the two posts, a latch rod mounted for horizontal sliding movement in the gate frame and for extension and retraction of a portion thereof from the swinging end of the frame, resilient means urging said latch member to extended position, a latch keeper adapted to be mounted on the latch post for receiving said latch member when extended, a lever plate pivotally mounted on the gate frame for swinging movement about a vertical pivot between said two bumper bars, a pair of links respectively pivotally connected at their outer ends to swinging portions of said respective bumper bars, each link being pivotally connected to said lever plate at a point on said lever plate across the same from the bumper bar to which the particular link is connected, a head carried by the inner end of said latch rod and a pair of link rods pivotally connected to said lever plate respectively adjacent opposite edges there-

of, said link rods being loosely slidably received in said head and having head engaging portions at their ends remote from said lever plates.

7. A bump gate comprising a gate frame having a pivot end and a swinging end, means for mounting said gate frame between a pivot post and a latch post for swinging movement about the pivot post and for return to a position at rest between the two posts, a pair of bumper bars pivotally connected at their upper ends on a substantially horizontal axis to said gate frame and respectively projecting downwardly at opposite sides of the gate frame midway the length of the gate frame in position such that one of the bumper bars will be struck by the approaching end of a vehicle driven in either direction to pass between the two posts, a latch member mounted on said gate frame for extension and retraction of a portion thereof from the swinging end of the frame, resilient means urging said latch member to an extended position, a latch keeper for receiving the latch member when extended, a lever disposed horizontally and pivotally mounted on said frame about a vertical axis between said bumper bars, a pair of links having outer ends pivotally connected to the respective bumper bars and extending toward each other and having inner ends pivotally connected to said lever, linkage between said lever and said latch member retracting said latch member against the tension of said resilient means as said lever is actuated by inward movement of one of said bumper bars toward said frame, and guide elements mounted at the lower portion of said frame preventing entanglement of said bumper bars with portions of the bumper of the vehicle as it passes between the posts and consequent deformation of said cars and guiding the travel of said bumper bars in a direction transverse to said frame.

8. The structure of claim 13 wherein the pivot post for the gate is disposed upright and the gate frame carries upper and lower collars projecting from the pivot end of the gate frame longitudinally thereof, said collars fitting loosely

about the pivot post for turning movement thereabout concentric with the axis thereof and thereby mounting the gate frame for swinging movement about the post and also for vertical sliding movement along the pivot post during the swinging movement, and a single flexible supporting member constituting the sole vertical hanger for the gate frame, said flexible member extending along a straight line from the pivot post at a downward incline and disposed directly over the gate frame in the vertical plane thereof, said flexible member having its lower inner end secured to the gate and spaced from the pivot end of the gate, and a fastener securing the outer upper end of the flexible member to the pivot post at a point about the circumference thereof presented directly towards the gate when closed whereby the gate is slid upwardly along the pivot post when swung about the said post to an opened position and the gate when returned moves by gravity to its closed position.

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