

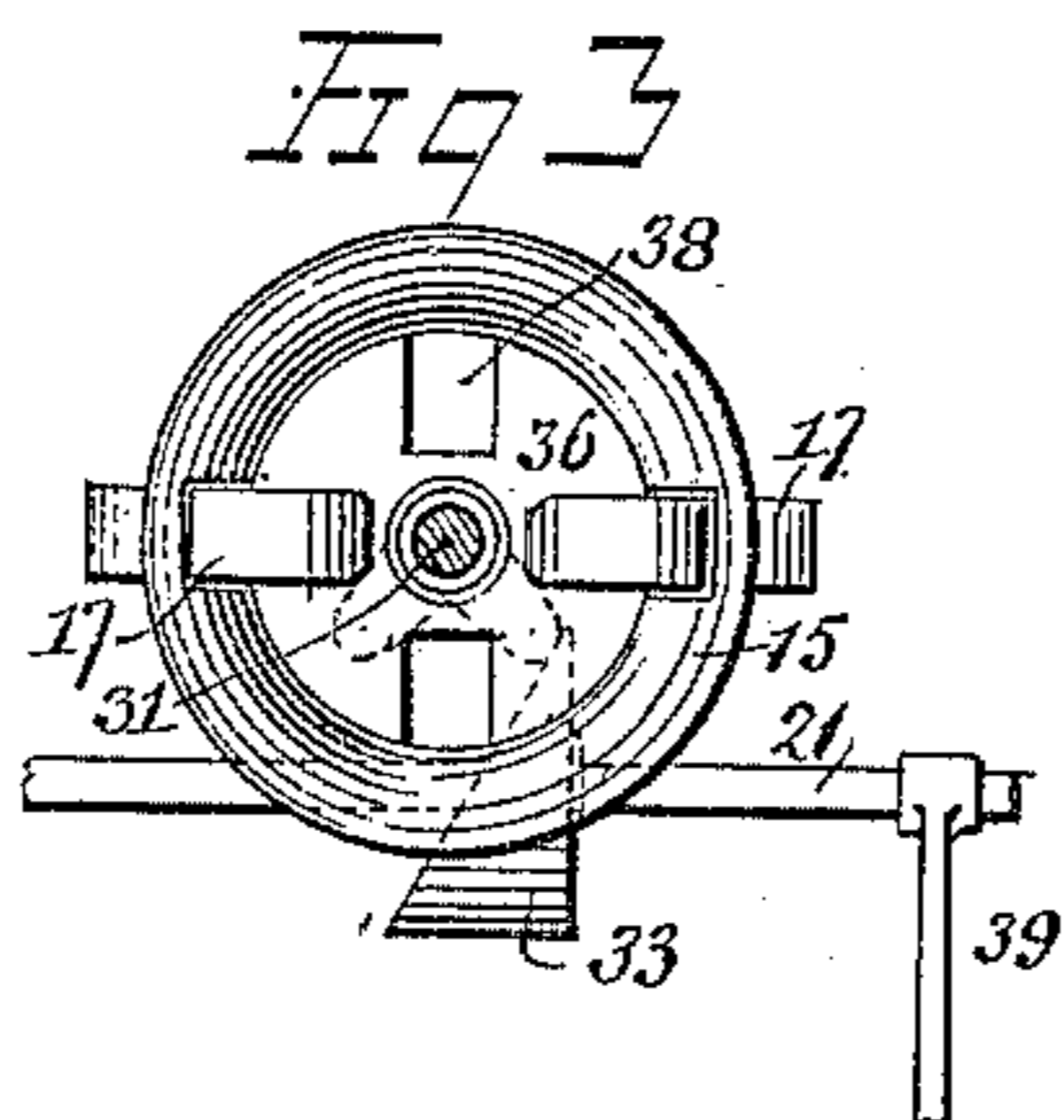
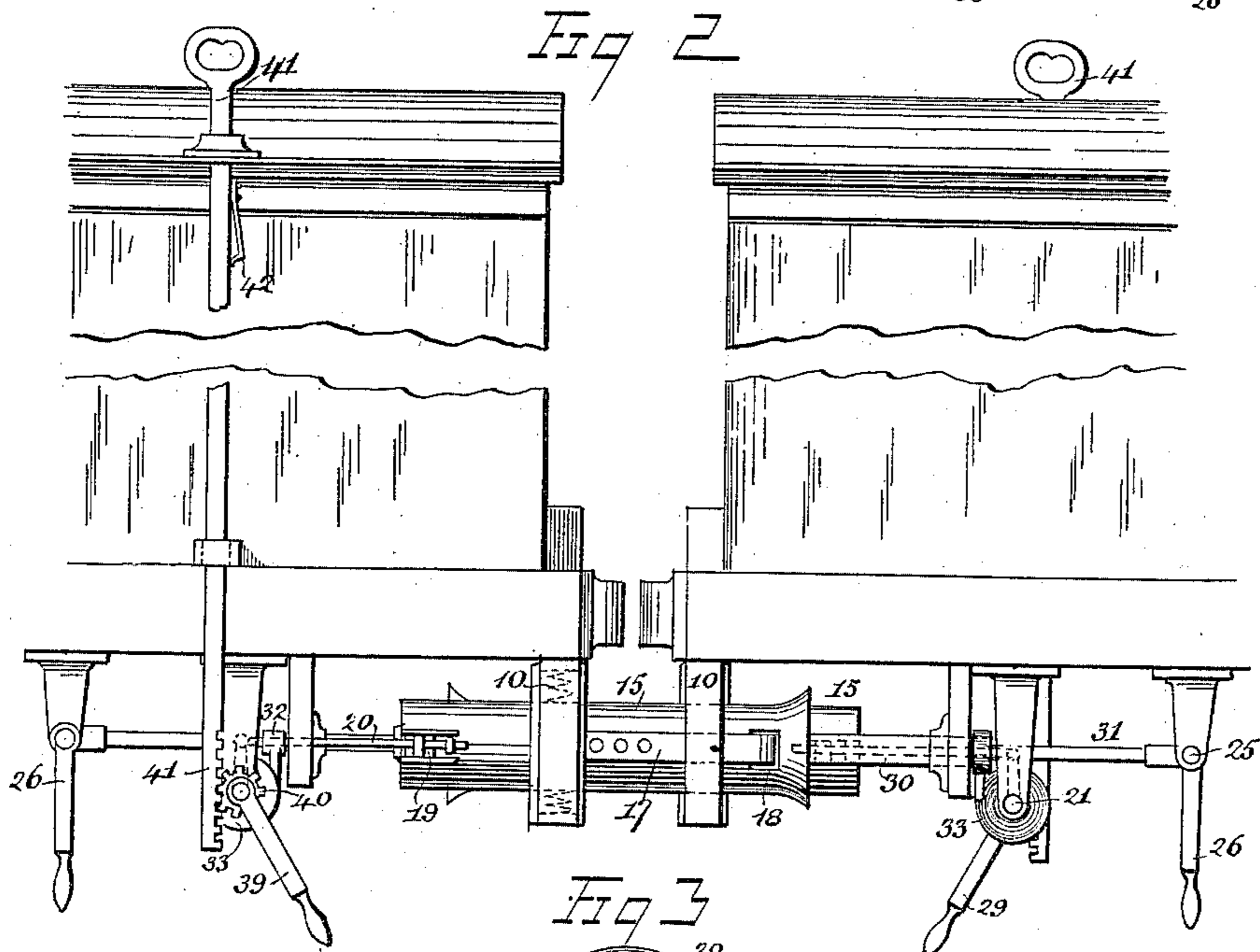
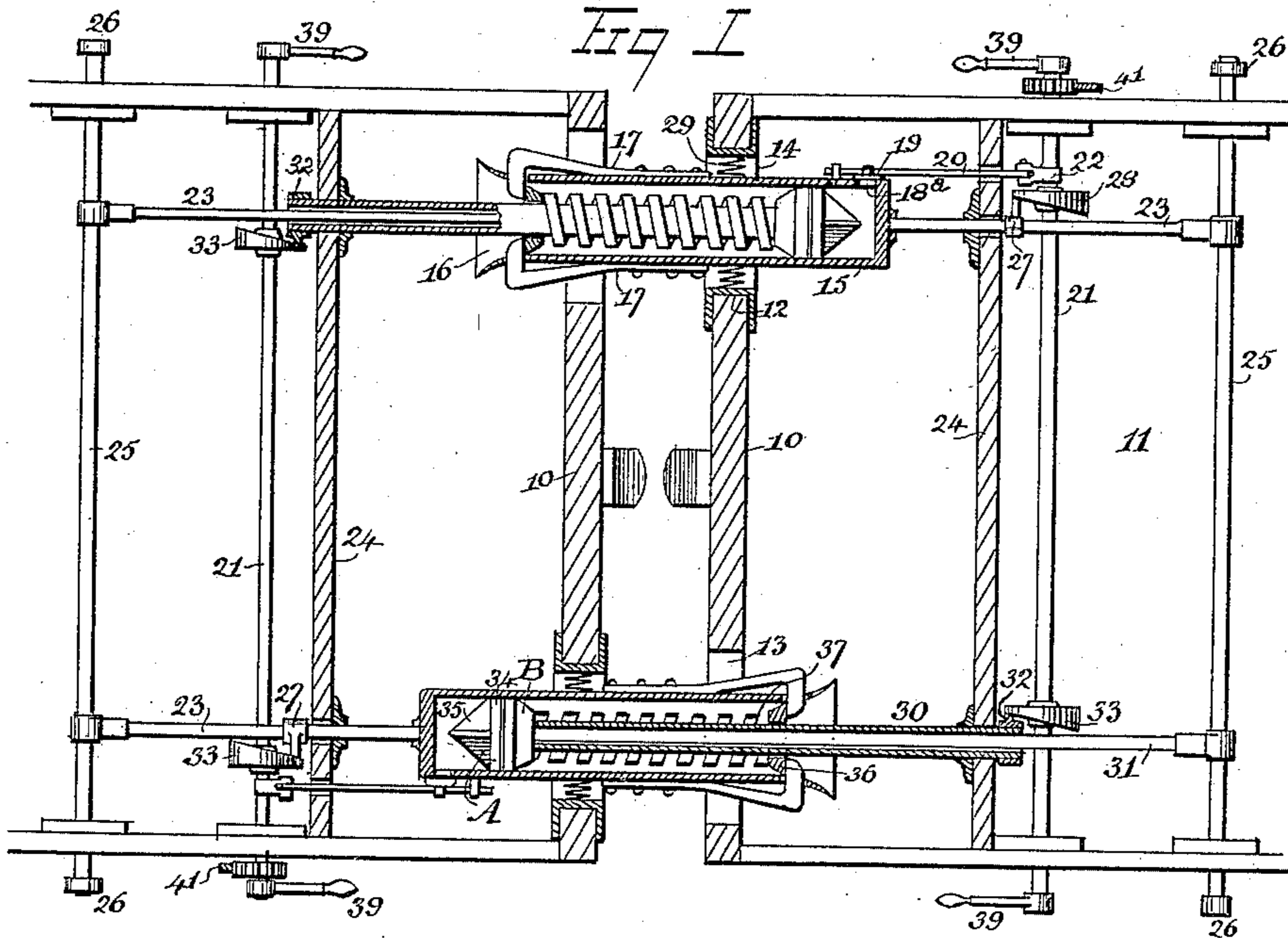
(No Model.)

2 Sheets—Sheet 1.

G. A. LA FEVER.
CAR COUPLING.

No. 424,214.

Patented Mar. 25, 1890.



WITNESSES:
H. Walker
C. Sedgwick

INVENTOR:
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(No Model.)

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Fig 4

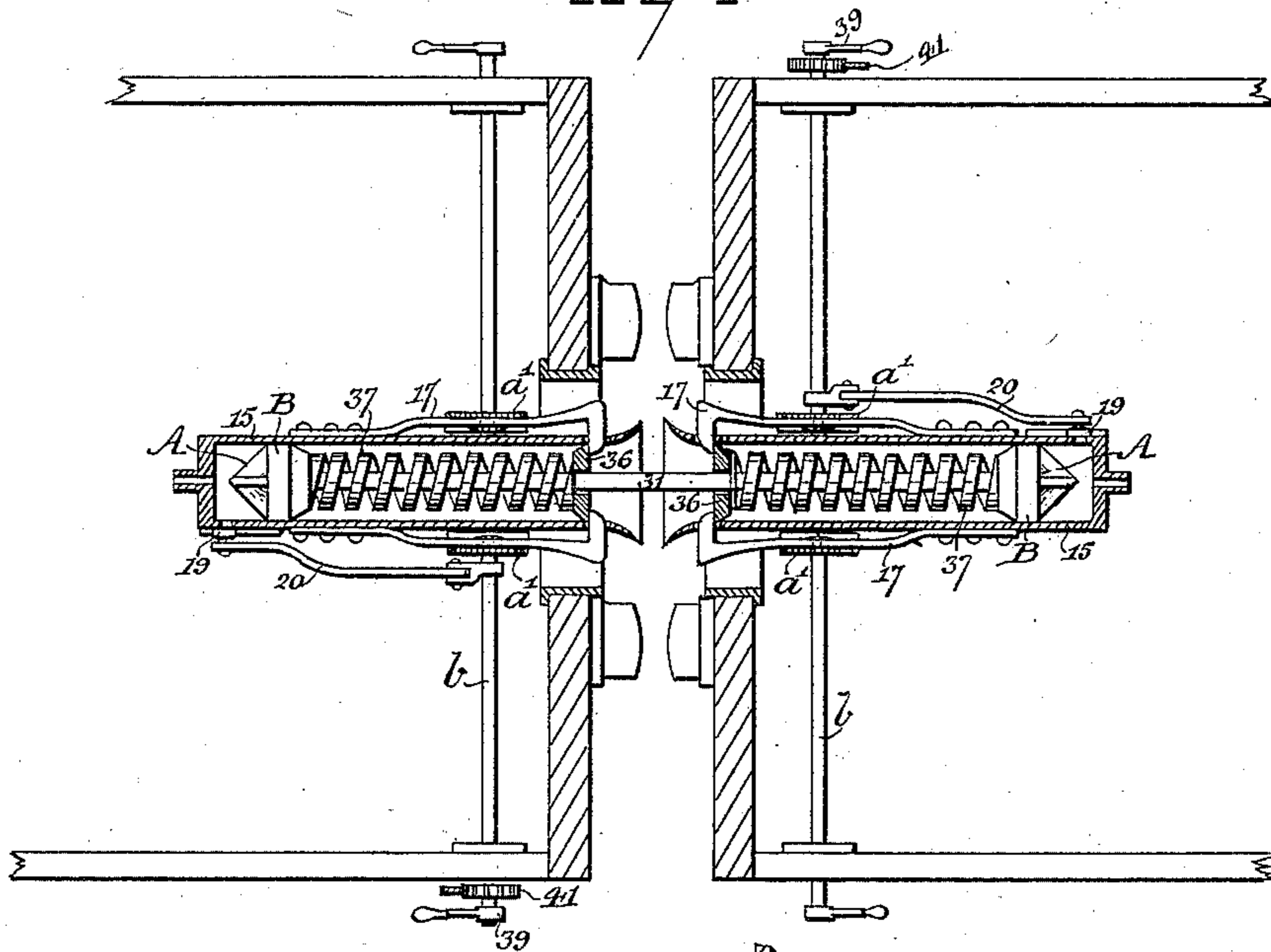


Fig 5

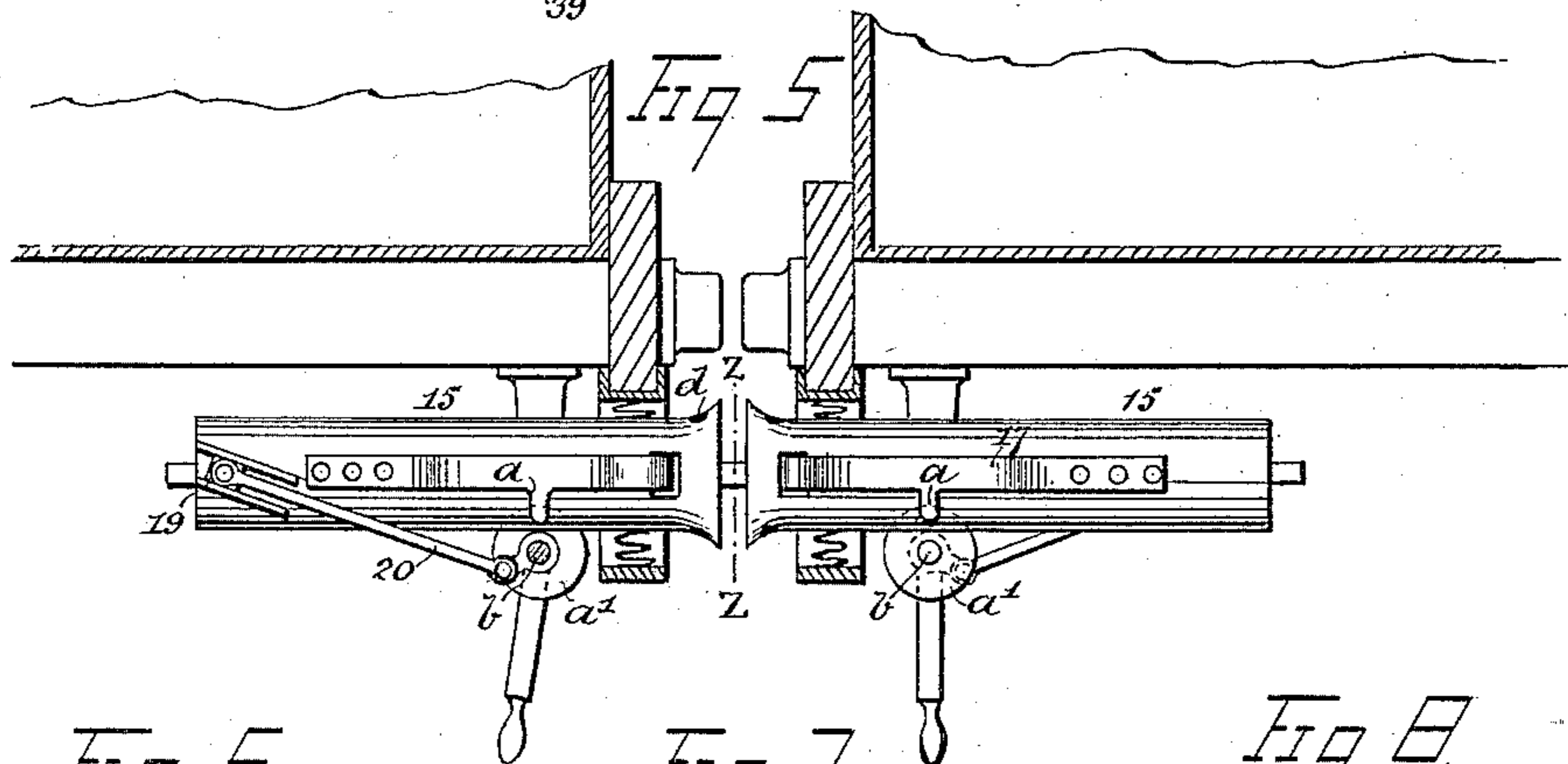


Fig 6

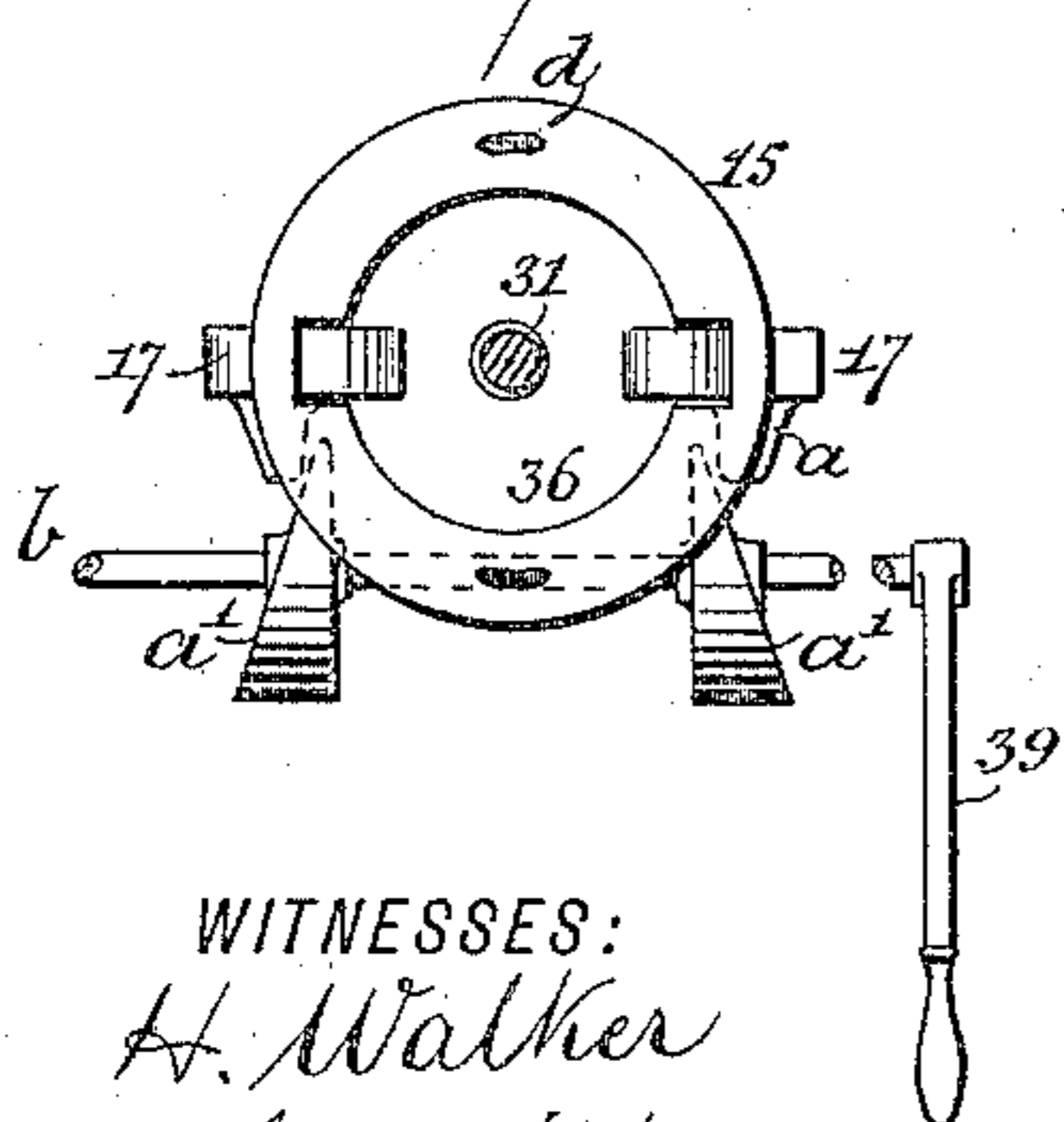


Fig 7

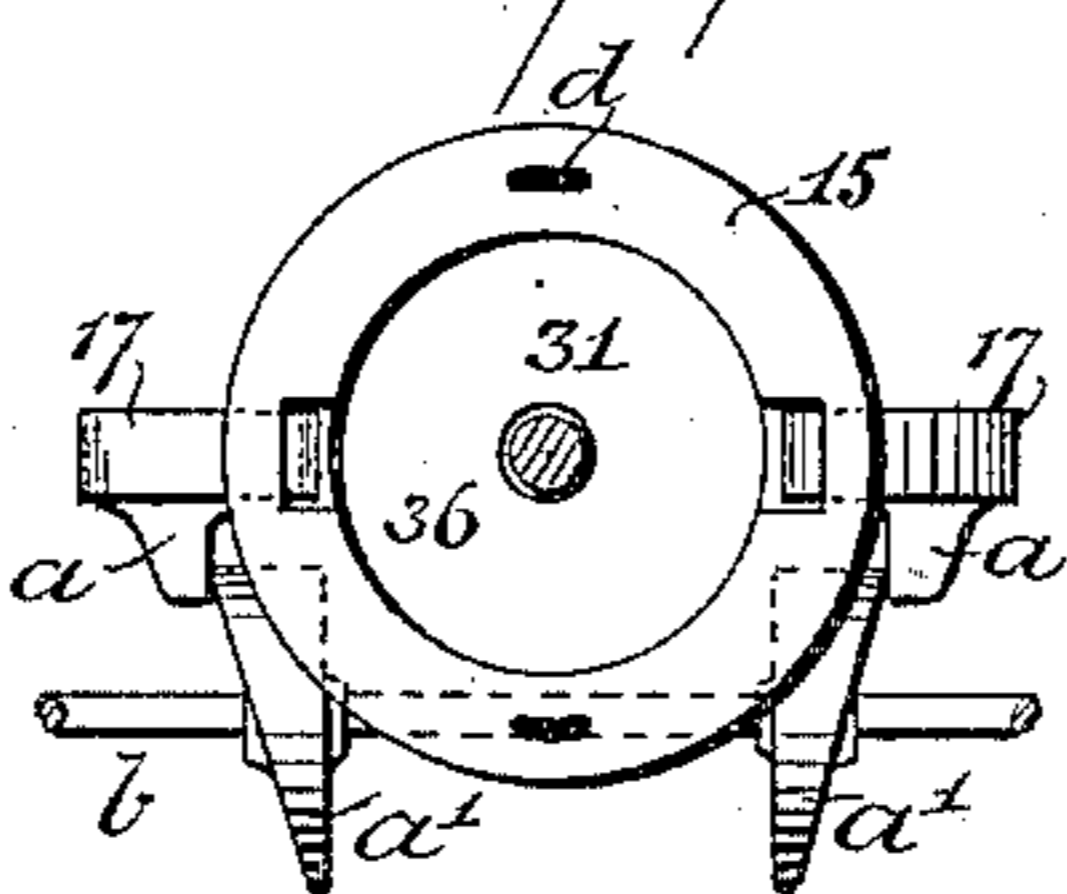
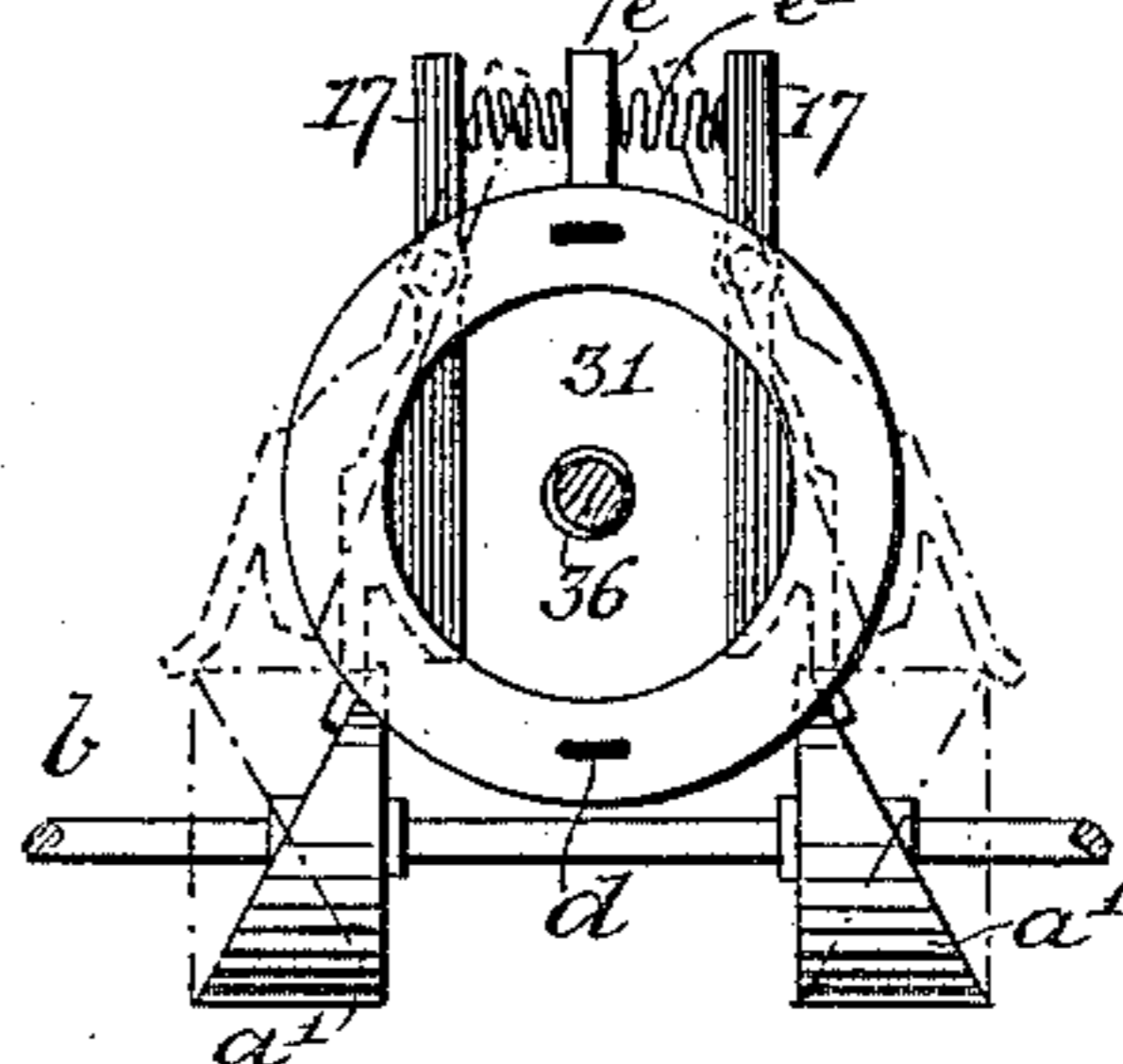


Fig 8



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UNITED STATES PATENT OFFICE.

GEORGE A. LA FEVER, OF SELKIRK, NEW YORK.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 424,214, dated March 25, 1890.

Application filed May 7, 1889. Serial No. 309,938. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. LA FEVER, of Selkirk, in the county of Albany and State of New York, have invented a new and Improved Car-Coupler, of which the following is a full, clear, and exact description.

My invention relates to an improvement in car-couplers, and has for its object to provide a pneumatic coupling which will deaden the effect of collisions and prevent telescoping and derailment of the cars in the event a collision should occur.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter more fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters and figures of reference indicate corresponding parts in all the views.

Figure 1 is a bottom plan view of the construction of two opposed cars having my improved coupler applied, the draw-head of the said couplers being in section. Fig. 2 is a partial side elevation of two opposed cars having the coupler attached. Fig. 3 is a front elevation of the pneumatic draw-head. Fig. 4 is a central horizontal section through a modified form of the coupler, illustrating the pneumatic cylinder as located centrally beneath the cars and the application of a double-headed piston. Fig. 5 is a side elevation of the cylinders illustrated in Fig. 4. Fig. 6 is a section on line $z z$ of Fig. 5, illustrating the hooks in a coupled position. Fig. 7 is a similar view showing the hooks in an uncoupled position; and Fig. 8 is a similar view to Figs. 6 and 7, illustrating a modified form of hook.

In a beam or hanger 10, located beneath the sill of the car 11, openings 12 and 13 are made, one at each side of the center, one of said openings 12 being provided with a metal thimble 14. Through the thimble-opening a pneumatic cylinder 15 is projected outward beyond the hanger, which cylinder at its outer end is open, and the sides are made flaring, as best shown at 16. At each side of the cylinder a spring-hook 17 is rigidly secured at one end, the free or engaging ends of which hooks project within the cylinder near the bell-mouth through openings 18 formed there-

in, as best illustrated in Figs. 1 and 2. In one side of the cylinder 15 an opening 18^a is produced, covered by a slide-valve 19, which valve is connected by a rod 20 with a rock-shaft 21, journaled beneath the car, preferably between the truck and the end of the car, the link being attached to the shaft through the medium of a crank-arm 22; but the slide-valve may, if desired, be united to the said rock-shaft in any suitable or approved manner.

The cylinder 15 is held in a horizontal position by a rod 23, rigidly secured to its rear end, which rod, passing, through an opening in the cross-sill 24, located beneath the car-body, is fastened at its inner end to a shaft 25, journaled beneath the car-body to the rear end of the rock-shaft 21 by a swivel-joint. The cross-sill 24 is to be braced and of sufficient strength to sustain the strain ordinarily imposed upon draw-bars. This shaft 25 is provided at one or at both ends, which project beyond the car-body, with a crank-arm 26, whereby the shaft may be revolved when desired.

Upon the cylinder-rod 23 a finger 27 is fastened, which finger is engaged by a cam 28, fast upon the rock-shaft 21, the inner face of the cam contacting with the finger being beveled, as best illustrated in Fig. 1. When the shaft 21 is manipulated, the action of the cam upon the finger 27 will impart to the cylinder a quarter-turn. In order that the cylinder may not be injured by contact with the thimble 14 and also be sustained in a proper horizontal position between the opposed faces of the thimble and the cylinder, a series of spiral springs 29 are interposed. Thus the cylinder is made to rest in spring-bearings.

Through the opening 13 and an opening in the cross-sill 24 a tube 30 is horizontally projected, and a rod 31 is passed through the said tube, the said rod being connected to the shaft 25 by a swivel-joint. The tube 30 is provided with a finger 32, corresponding to the finger 27 of the cylinder-rod, the said finger 32 being acted upon by a cam 33, alike in construction with the cam 28 and secured upon the same shaft—namely, the rock-shaft 21. The cam 33, by contact with the finger 32, imparts to the tube 30 a quarter-turn.

A piston 34 is constructed in two parts, one telescoping and held to revolve in the other,

the part A, which is the outer portion, being secured to the extremity of the rod 31 and the inner portion to the tube 30. The outer section A of the piston is conical, and is so made in order that it may readily enter the bell-mouth of the pneumatic cylinder of an opposed draw-head in coupling the cars, and the inner section of the piston is beveled, so as to force the spring-hooks 17 outward and allow the piston to pass out of the cylinder. The said outer section is also provided with a series of ribs 35, which also serve to guide it in said cylinder. Each section of the piston is provided with slots so arranged that when the piston is in its normal position the slots in the two sections will not register; but when the quarter-turn is imparted to the tube 30 by the cam 33 the inner section of the piston will be turned so that the slots in the two piston-sections will be brought one over the other. This is to prevent suction when the piston is withdrawn from the cylinder 15 in uncoupling.

Upon the tube 30 a disk 36 is mounted to slide, but not to turn, the periphery of which disk is beveled in the direction of the piston, and the said piston and disk are connected by a spiral or coil spring 37. In the disk 36 two marginal and aligning recesses 38 are produced, as illustrated in Fig. 3, so that when the tube 30 is turned the recess of the disk will be brought into alignment with the hooks 17 and thereby permit the piston to be withdrawn from the cylinder.

The outer end of the rock-shaft 21 is provided with a crank-arm 39, and preferably with a pinion 40, capable of engaging a toothed end of a bar 41, carried upward at the end of the car to the top of the same, whereby the rock-shaft may be operated from the top as well as from the side of the car. When it is not desired to use the rod 41, it is drawn upward and held out of engagement with the pinion by a spring 42, attached to the car and entering a recess in the rod or attached to the rod and contacting with an offset in the car.

The crank-arms of the shafts 21 and 25 are preferably located on the same side of the car, and if in practice it is found desirable both extremities of the two shafts may have a crank-arm attached.

When the cars are coupled and it is desired to uncouple them, the rock-shaft 21 of one car is manipulated, when the cams 28 and 33 on the said shaft will operate upon the projections 27 and 32, respectively, and turn the cylinder 15 and tube 30, so as to bring the notches of the disks 36 and the hooks 17 into alignment. The turning of the tube 30 also turns the outer section of the piston, so that the slots of the two sections of the piston are made to register, so that the air in front of the piston of that cylinder can pass out through the mouth of the said cylinder and thereby prevent suction. The above-described movement of the rock-shaft

21 also operates the valve 19, so that the air in front of the piston of that cylinder is allowed to escape through the opening 18^a covered by said valve and thereby prevent suction in the said cylinder. Thus, as the cars are drawn apart, the pistons are free to leave their respective cylinders. When the pistons have been withdrawn, the cylinders are returned to their normal position. In coupling the pistons force the hooks 17 outward and obtain admittance thereby to the cylinder, and the disk 36 following also forces the hooks outward, which hooks, when the disk is passed, spring inward to a contact with the outer face of the disk, as illustrated in Fig. 1, thus insuring a coupling. It will be observed that as the pistons in coupling force the air ahead of them in the cylinders an air-cushion is obtained, and a suitable air-vent may be made in the inner end of each of the cylinders to permit a gradual escape of the air, if so desired. In the event that the cylinder and piston of one car are lower or higher than those of an opposed car with which the coupling is to be effected, the said cylinder and piston of either car may be raised or lowered by turning the shaft 25.

In Figs. 4 and 5 the pneumatic cylinders are illustrated as located centrally beneath the car-body, one cylinder only being employed at each end of the car. The hooks 17, attached to each cylinder, are provided with a lug *a*, extending from the under side at or near the center, the lug of each cylinder being adapted to be engaged by a cam-disk *a'*, having one inclined face similar to the cams 33 in Fig. 1. The cam-disks *a'* are rigidly mounted upon a rock shaft *b*, corresponding to the shaft 21, heretofore described, in such manner that one cam will be located at each side of the cylinder. The rock-shaft *b* is actuated by the same mechanism shown in connection with the shaft 21. The slide-valve 19, covering the side vent in the cylinder, is located in the modification diagonally of said cylinder, and the rod 20 is attached to a crank-arm of the rock-shaft *b*. The cylinder is provided at the outer end with a top and bottom aperture *d* to admit a pin when coupling with an ordinary link draw-head.

It will be understood by reference to Figs. 6 and 7 that when the thin surfaces of the cams are uppermost the heads of the hooks are sprung into the cylinder to a coupling position, and when the thickest surfaces of the cams are brought uppermost the heads of the hooks are forced outward to the uncoupling position.

In Fig. 8 I have illustrated a modified form of hook, the hooks being pivoted in vertical slots in the cylinder and made in blade form, having a wide lower portion or body and a narrow upwardly-extending shank. The shanks of this form of hook are attached to a post *e*, integral with the cylinder, by springs *e'*, which normally force the shanks outward, thereby holding the body in a coupled posi-

tion within the cylinder, as shown in positive lines. The bodies of the hooks are carried outward by the cams entering a recess in the lower edge of the body, as shown in dotted lines in Fig. 8.

In connection with the modified form of cylinders, the piston-rod 31 is provided with a head similar to that described in connection with Fig. 1 at both ends, and the spring 37 and disk 36 are duplicated. The rod is made of sufficient length to admit of one head and attachments to enter each opposed cylinder, as shown in Fig. 4. The piston is adapted to remain in one cylinder to enter an empty opposed cylinder in coupling.

It will be understood that with slight modifications in the construction of the piston the coupler may be used in connection with ferry-boats and ferry-slips or other vehicles, if desired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a pneumatic cylinder open at one end and spring-hooks extending through the sides of the cylinder, of a piston adapted to enter the cylinder and a disk carried by the piston-rod, substantially as shown and described.

2. The combination, with a pneumatic cylinder open at one end and spring-hooks extending through the sides of the cylinder, of a piston-head capable of entering the cylinder, a rod secured to said head, and a spring-actuated disk carried by said rod, substantially as shown and described.

3. In a car-coupler, the combination, with a car-body, of a pneumatic cylinder held beneath the car, projected outward therefrom, open at its outer end, and provided with spring-hooks secured to the sides and entering suitable apertures in said cylinder, a piston also supported beneath the car-body, provided with a spring-actuated apertured disk loosely mounted on the piston-rod, a rock-shaft journaled beneath the car, a rod carried rearward beneath said rock-shaft from the cylinder, a finger secured to the cylinder-rod and piston-rod, and cams attached to the rock-shaft engaging said fingers, substantially as shown and described.

4. The combination, with a car-body, a rock-shaft journaled beneath the car, provided with a cam at or near each end, and a second shaft to the rear of the rock-shaft, of a pneumatic cylinder having an open end and horizontally supported beneath the car, said cylinder being provided with spring-hooks, a rod attached to the cylinder and to the rear shaft, a tube horizontally supported beneath the car-body, a rod projected through said tube and secured to the rear shaft, a sectional piston having one portion secured to the rod and one to the tube, a spring coiled around the tube, a disk provided with recesses attached to said spring, and a finger upon the piston and cylinder rods capable of

engaging the cams upon the rock-shaft, substantially as and for the purpose specified.

5. The combination, with a car-body, a rock-shaft journaled beneath the same, provided with a cam, a pneumatic cylinder horizontally supported beneath the car-body, projecting outward therefrom, and having an open flaring outer end, spring-hooks secured to said cylinder and projecting within the same, a rod attached to said cylinder and to a support beneath the car, and a finger secured to the said rod contacting with the cam of the rock-shaft, of an opposed car-body provided with a tube horizontally supported beneath the said body and projecting outward therefrom, a rod rigidly attached at one end beneath the body of the car and projecting outward through the tube, an apertured sectional piston having one portion secured to the said tube and the other to the said rod, a recessed disk loosely mounted upon the tube, a spring connecting the disk and piston, a rock-shaft, a cam upon said rock-shaft, and a finger upon said rod engaging the said cam, substantially as and for the purpose specified.

6. The combination, with a car-body, a rock-shaft journaled beneath the car, provided with a cam at or near each end, and a second shaft to the rear of the rock-shaft, of a pneumatic cylinder having an open end and horizontally supported beneath the car, said cylinder being provided with spring-hooks, a rod attached to the cylinder and to the rear shaft, a tube horizontally supported beneath the car-body, a rod projected through said tube and secured to the rear shaft, a sectional piston having one portion secured to the rod and one to the tube, a spring coiled around the tube, a disk provided with recesses attached to said spring, a finger upon the piston and cylinder rods capable of engaging the cams upon the rock-shaft, a valve held to slide upon the inner end of the cylinder and covering the opening therein, and a link-connection between the said valve and rock-shaft, substantially as shown and described.

7. In a car-coupler, a draw-head consisting of a cylinder open at one end and spring-hooks secured to said cylinder, projecting within the same, a tube adapted to enter the cylinder between the hooks, a rod projected through the tube, an apertured sectional piston having one portion secured to the tube and the other to the rod, a recessed disk mounted loosely upon the tube, a spring connecting the disk and piston, and means, substantially as shown and described, for imparting to the cylinder a quarter-turn, and also for imparting a quarter-turn to the piston-rod, as and for the purpose specified.

8. In a car-coupler, a draw-head consisting of a cylinder open at one end and spring-hooks secured to said cylinder, projecting within the same, a tube adapted to enter the cylinder between the hooks, a rod projected through the tube, an apertured sectional piston having one portion secured to the tube

and the other to the rod, a recessed disk
mounted loosely upon the tube, a spring con-
necting the disk and piston, a valve held to
slide over an opening formed in the cylinder
5 near its inner end, means, substantially as
shown and described, for operating said valve
and simultaneously imparting to the cylinder

a quarter-turn, and means for revolving the
piston-rod, as and for the purpose specified.

GEORGE A. LA FEVER.

Witnesses:

J. B. SELKIRK,

R. J. SMITH.