

No. 644,382.

Patented Feb. 27, 1900.

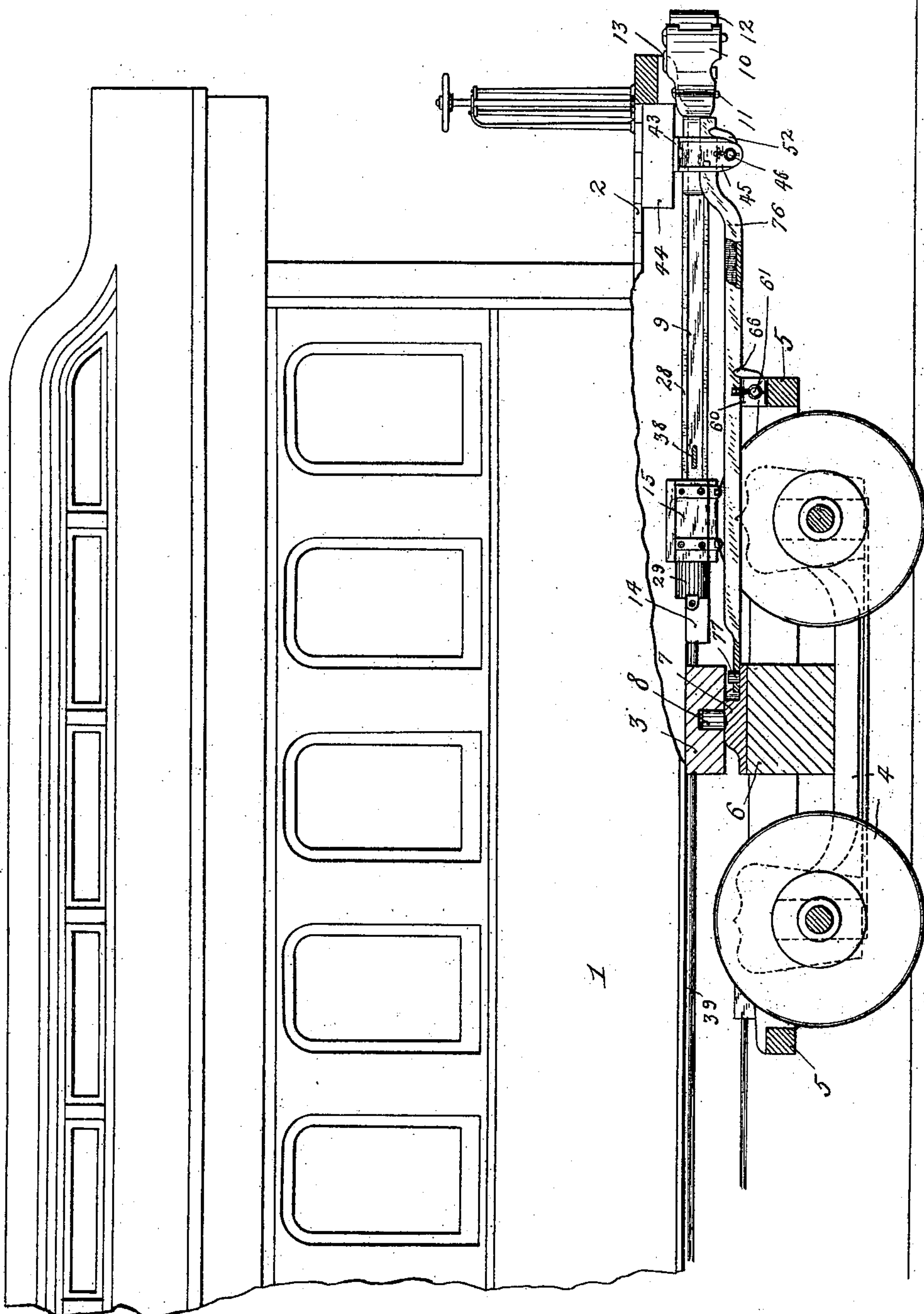
E. C. WASHBURN.
DRAFT RIGGING FOR CARS.

(Application filed Dec. 9, 1898.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1.



Witnesses.
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Fig. 2.

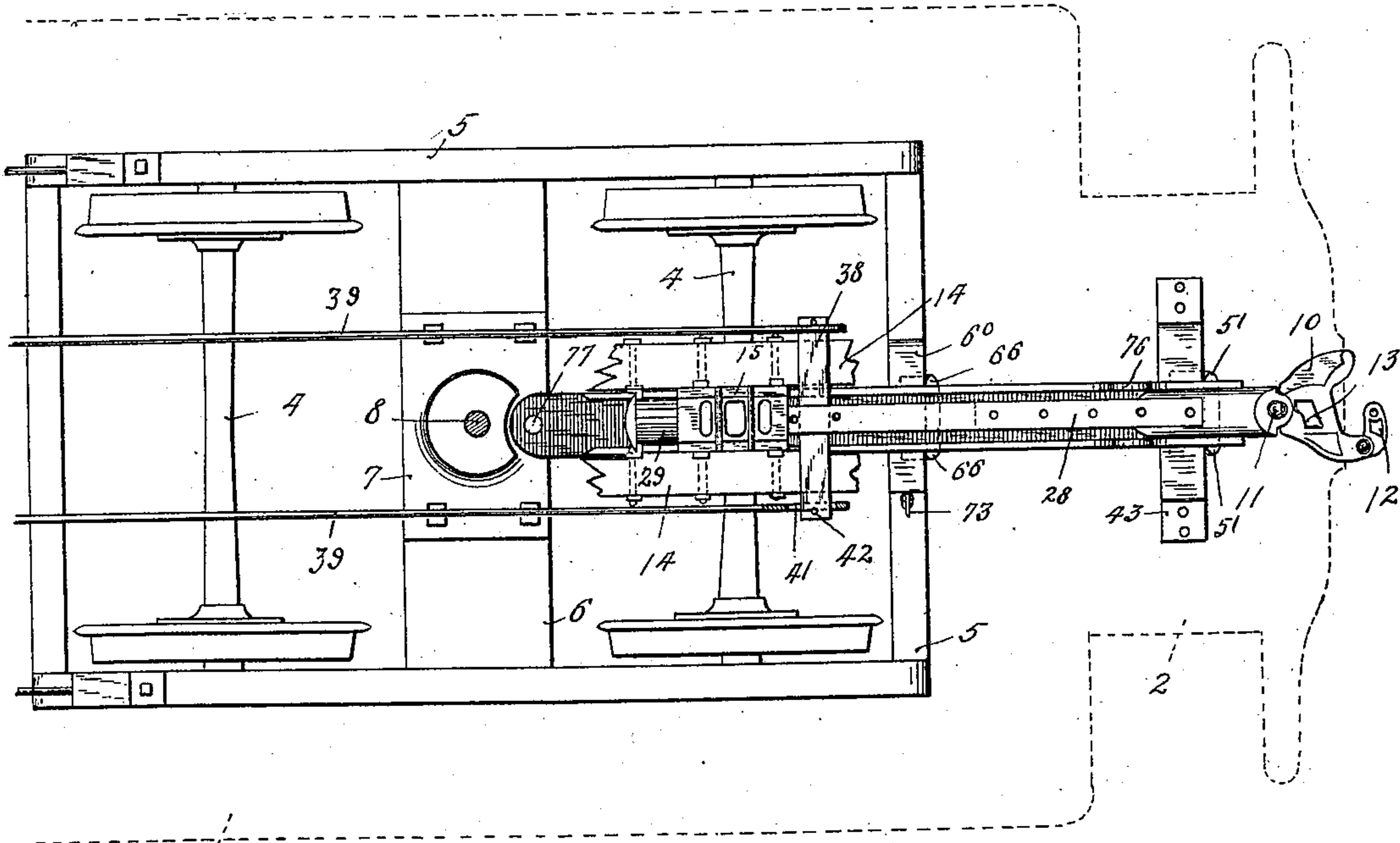


Fig. 3.

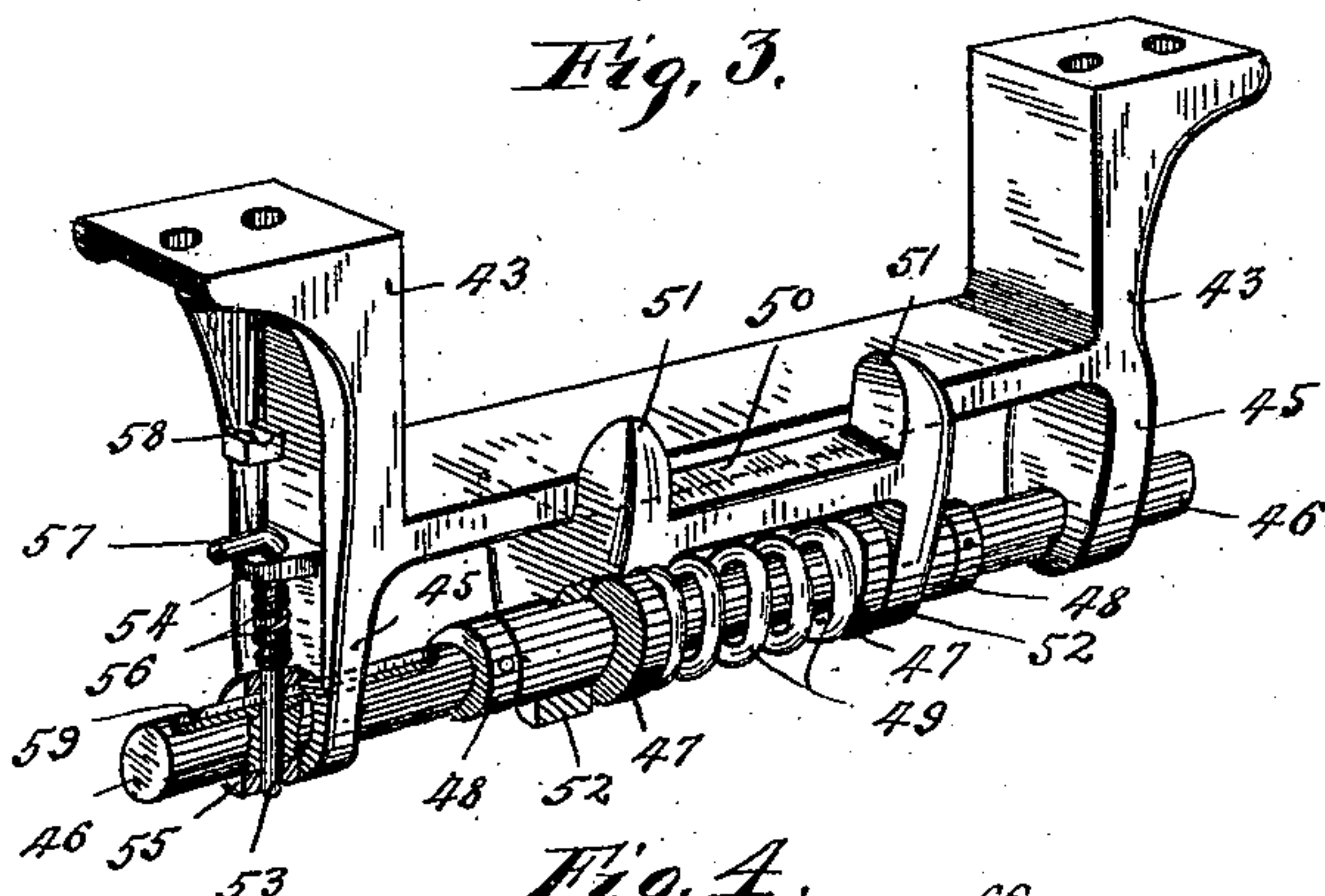
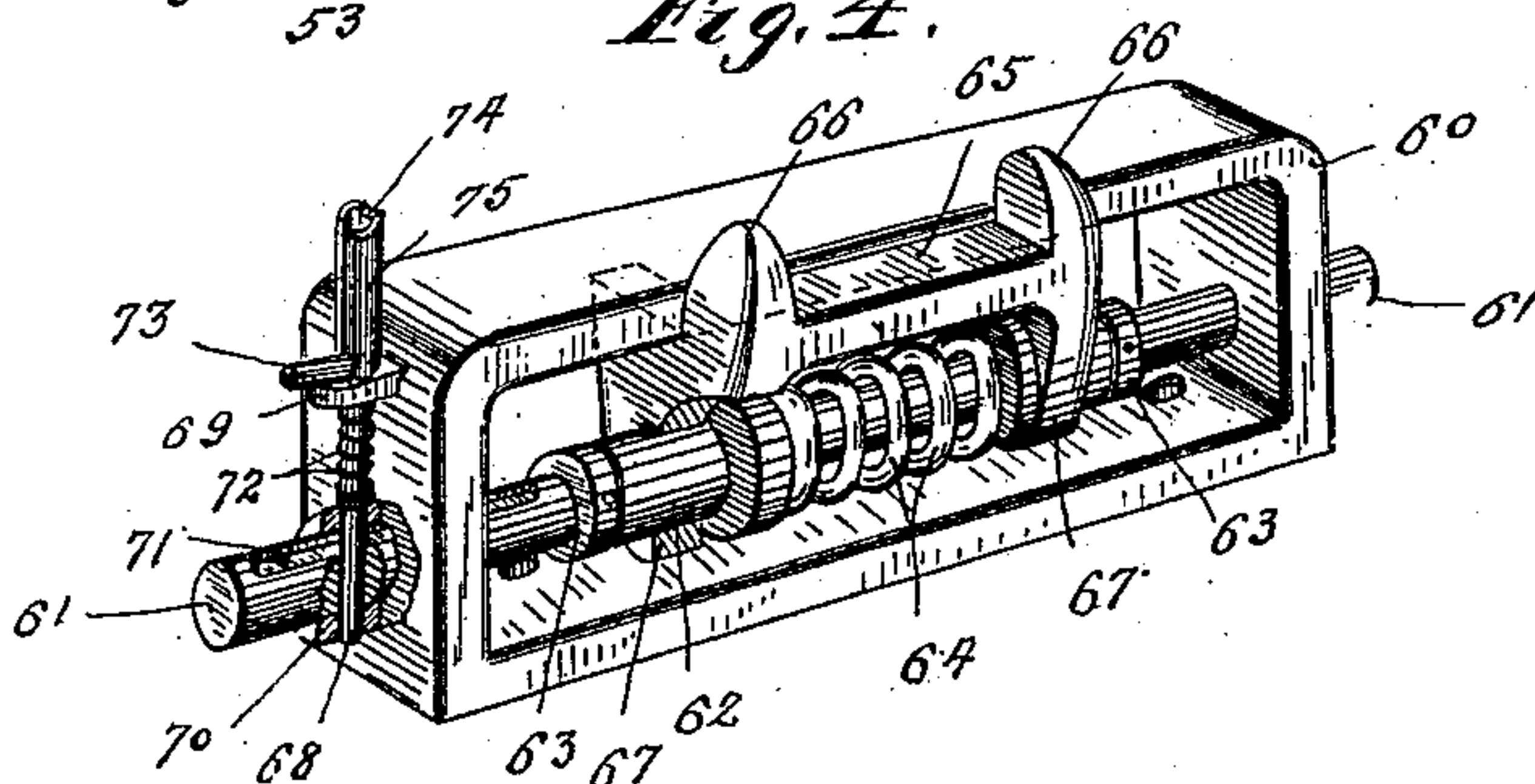


Fig. 4.



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Fig. 5.

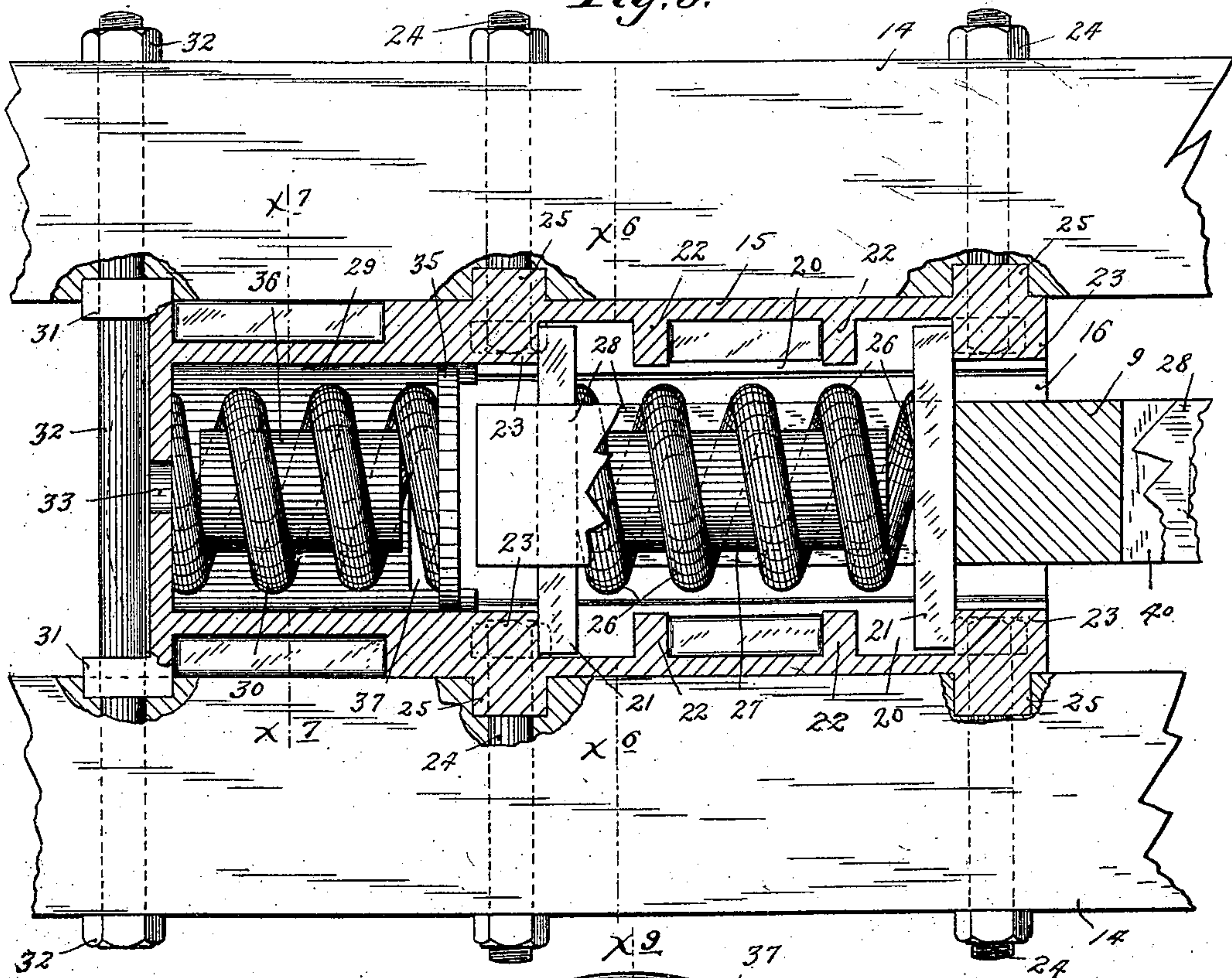


Fig. 6.

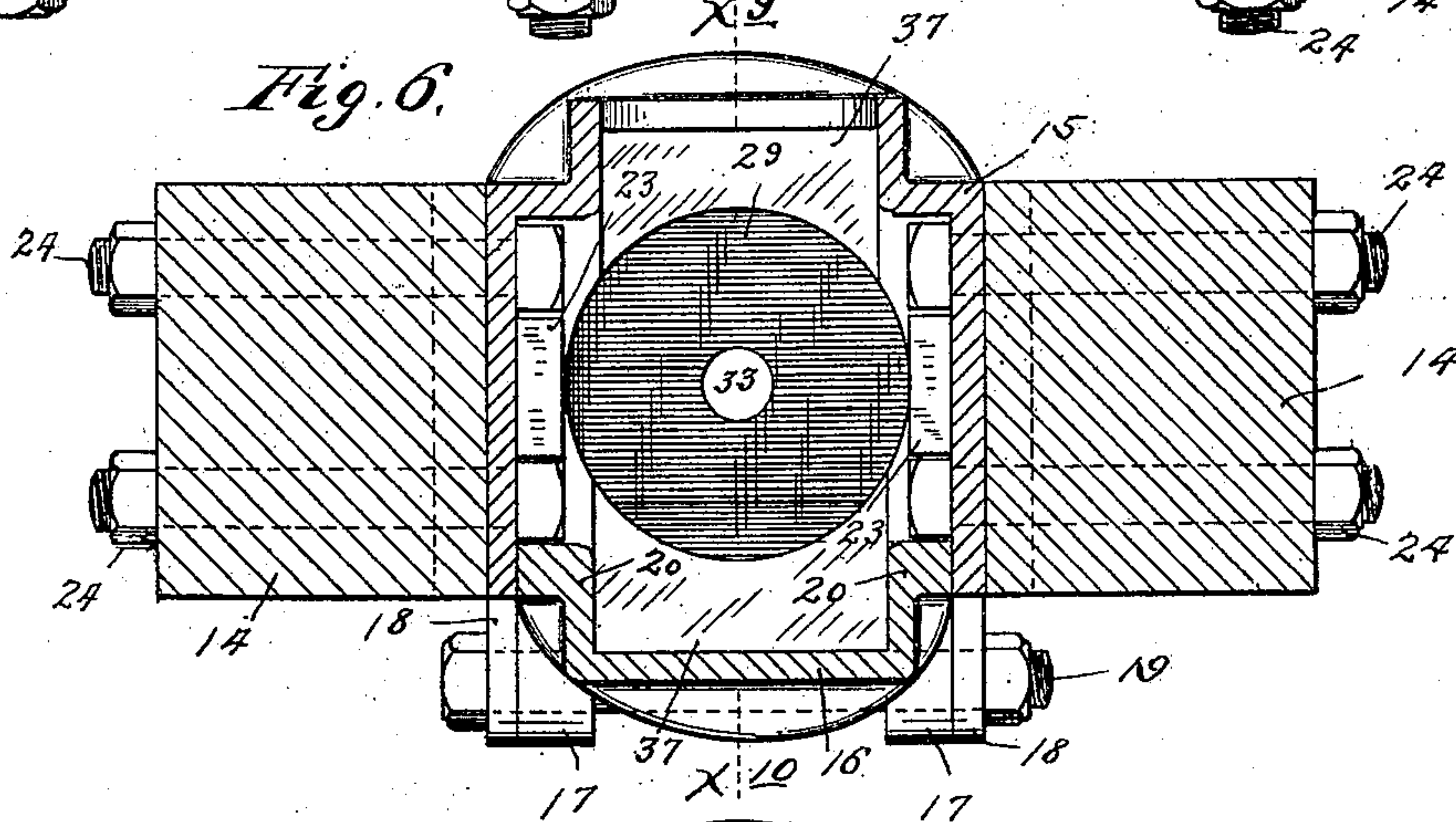
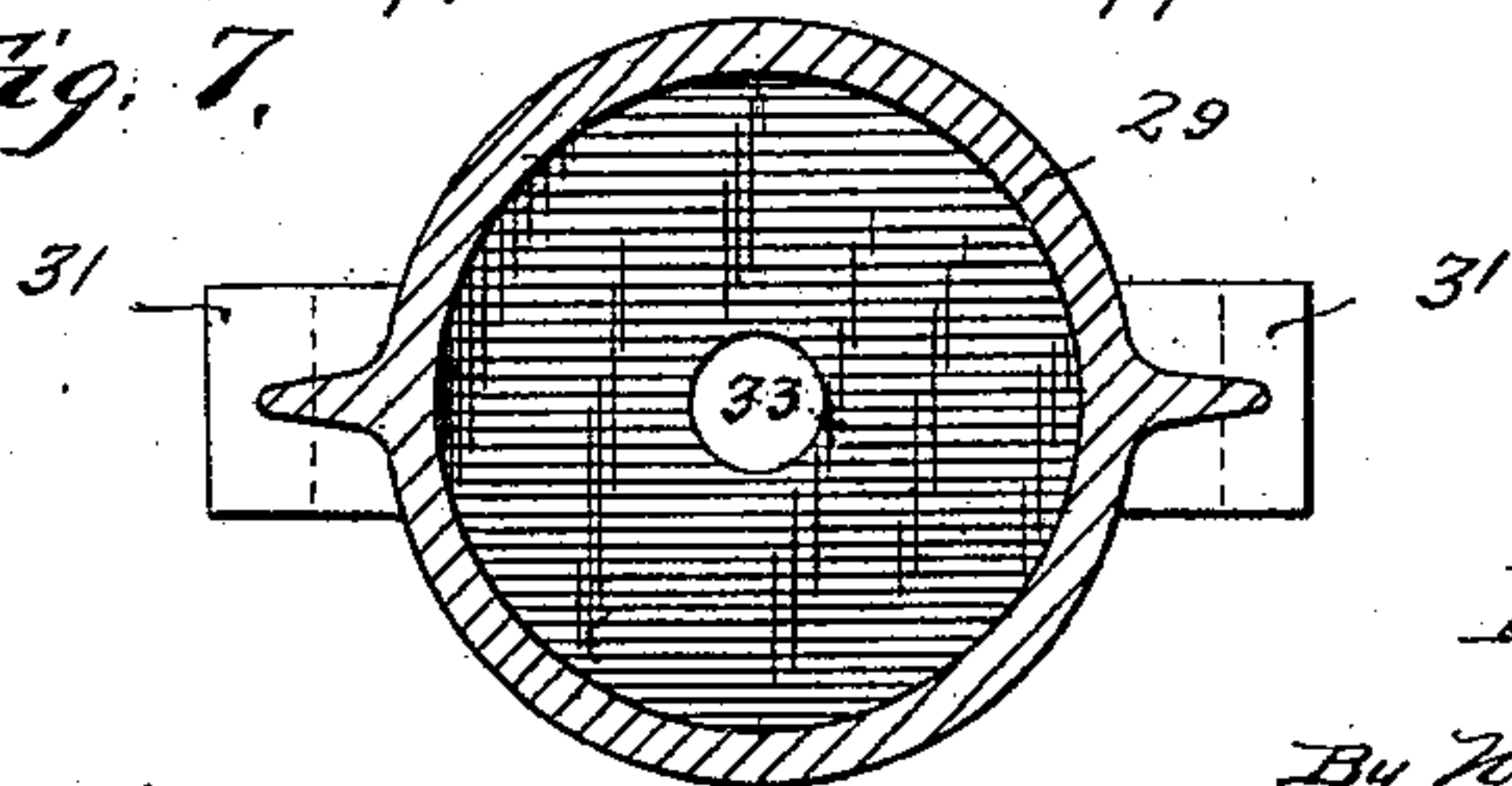


Fig. 7.



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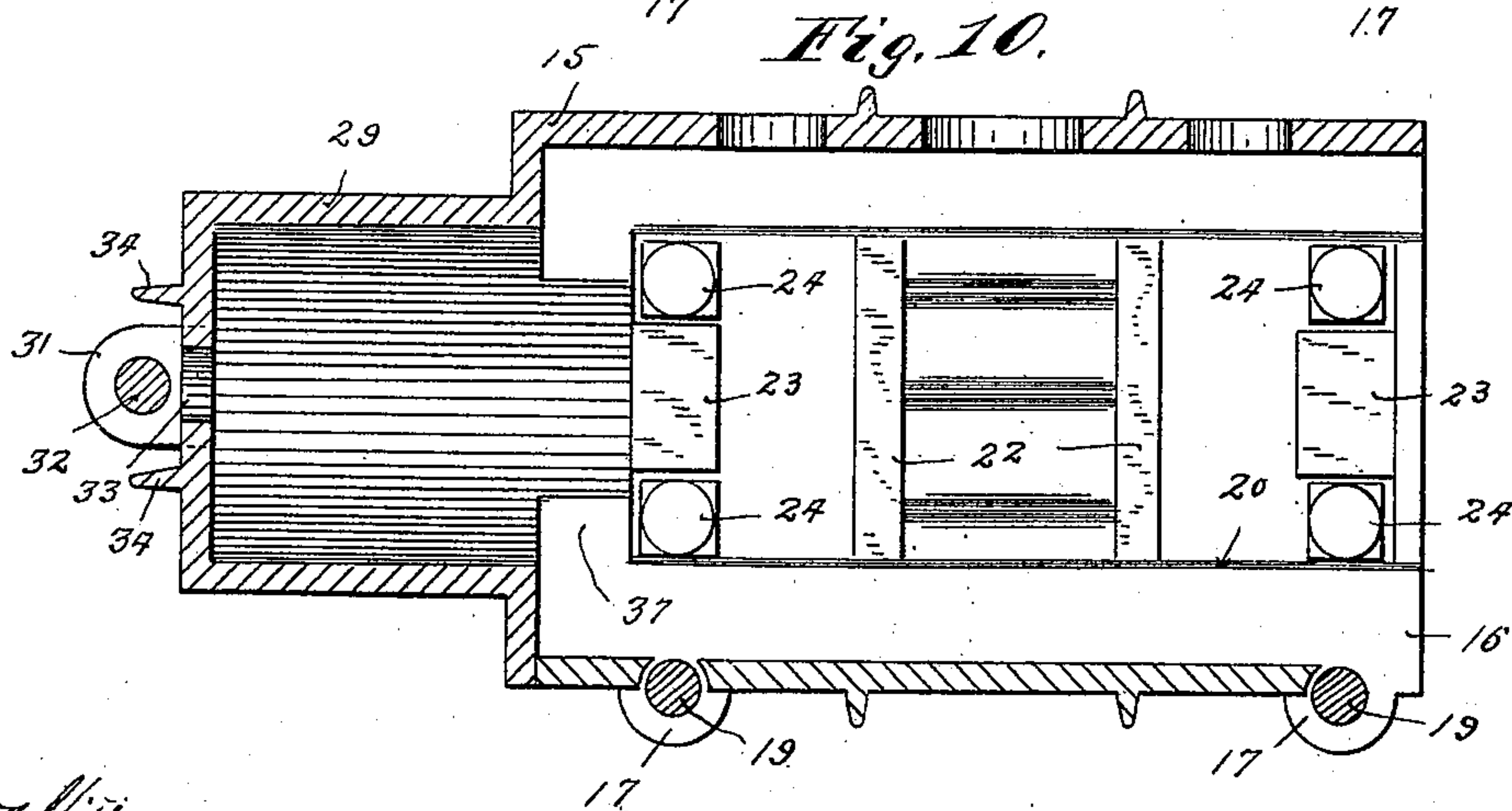
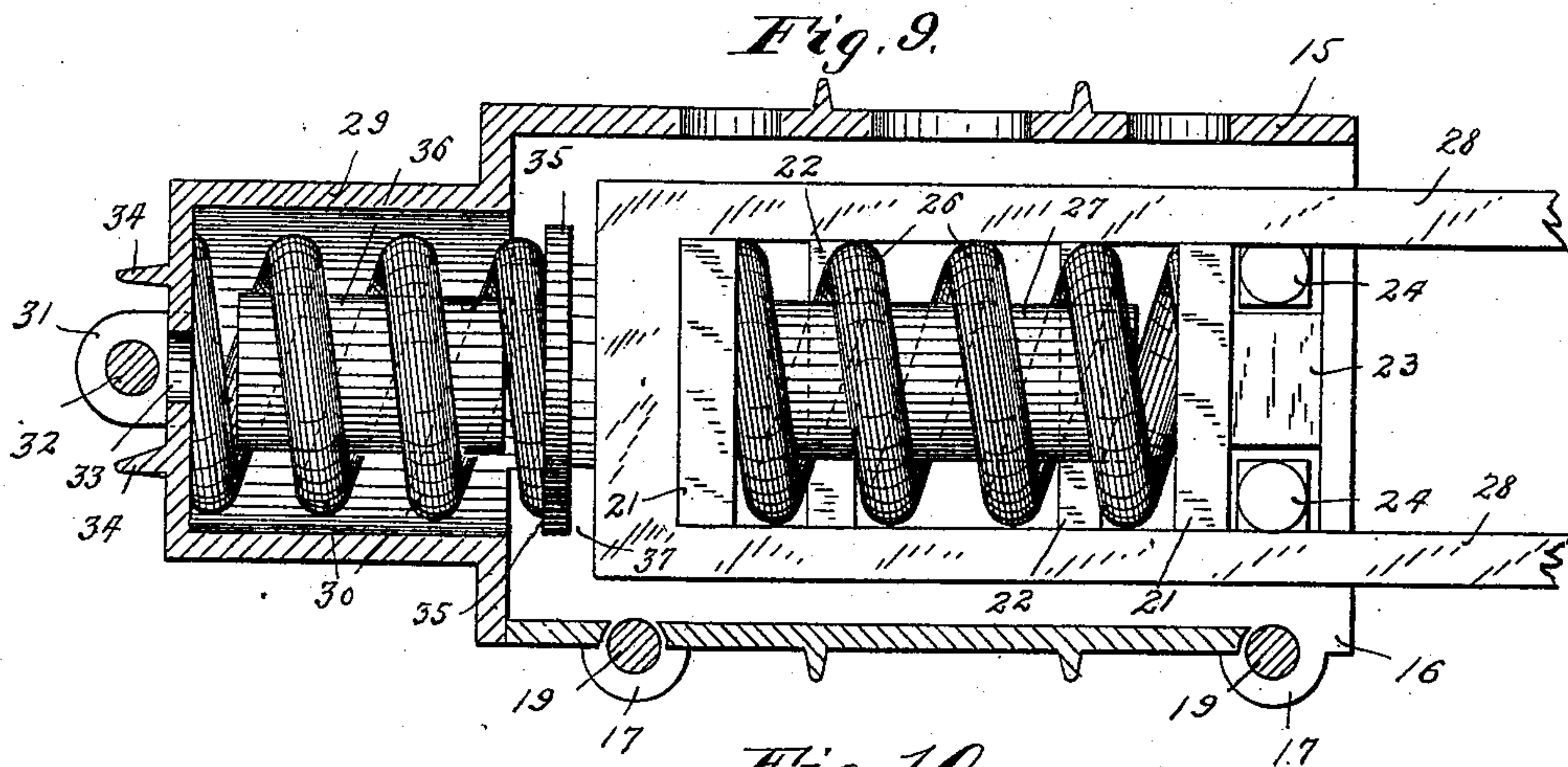
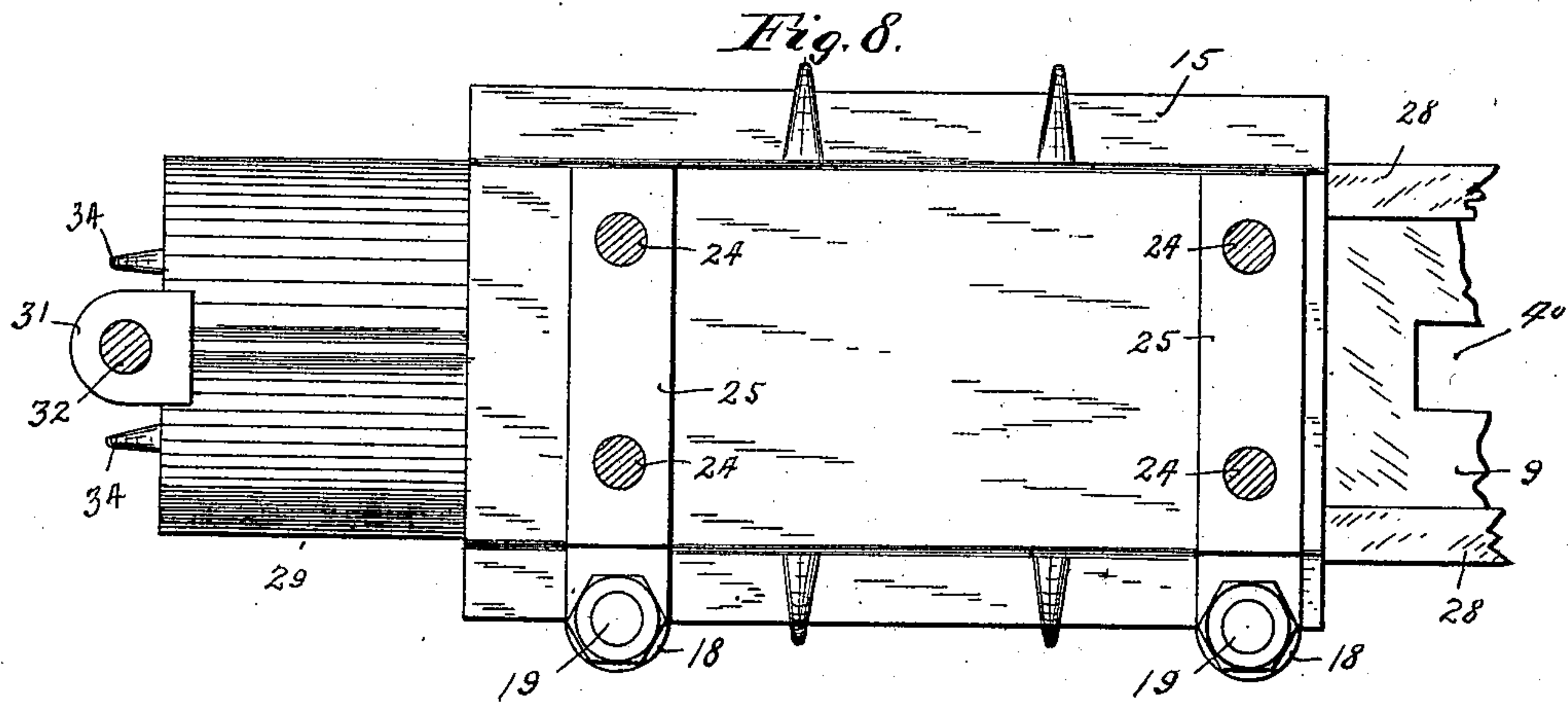
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5 Sheets—Sheet 4.



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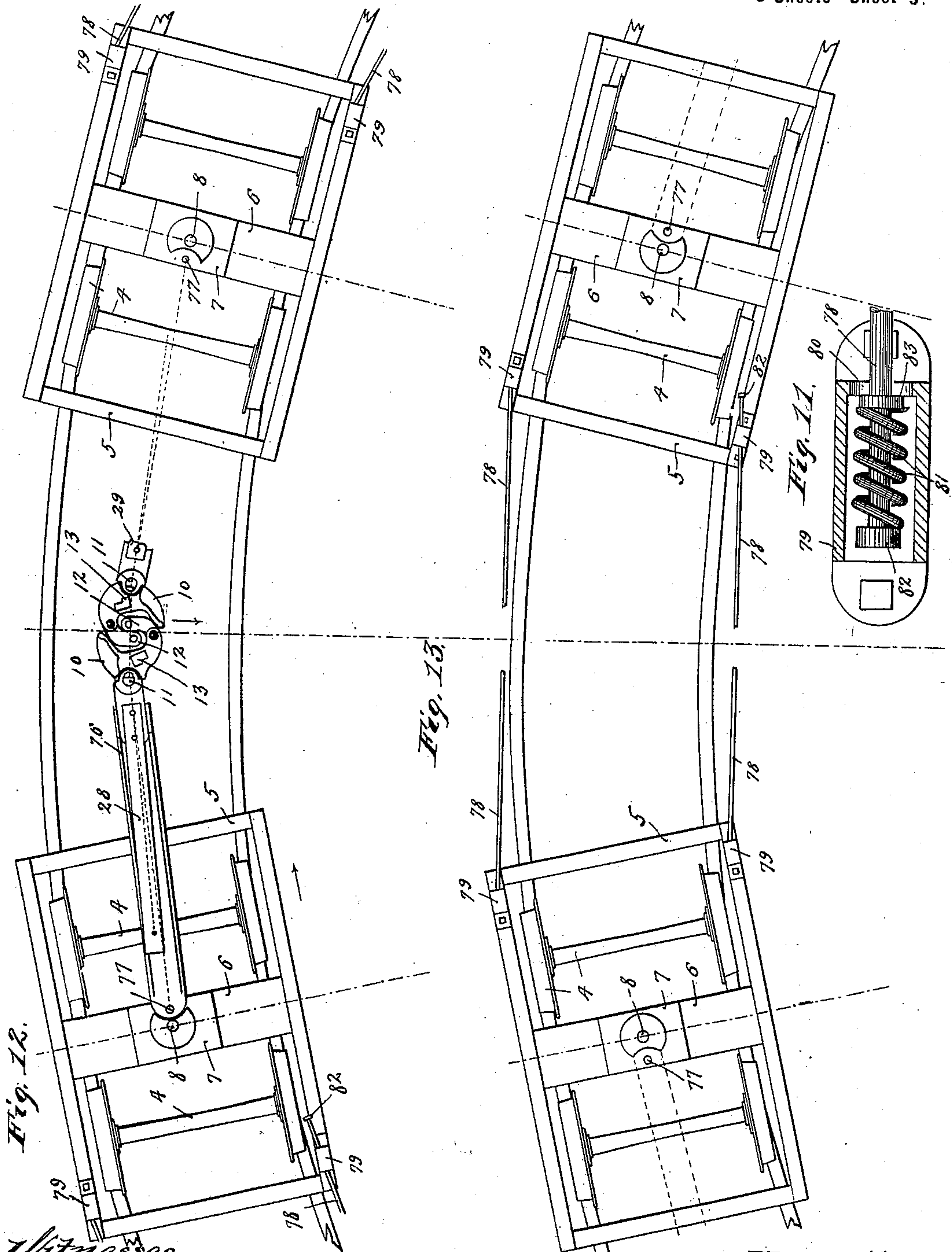
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5 Sheets—Sheet 5.

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UNITED STATES PATENT OFFICE.

EDWIN C. WASHBURN, OF MINNEAPOLIS, MINNESOTA.

DRAFT-RIGGING FOR CARS.

SPECIFICATION forming part of Letters Patent No. 644,382, dated February 27, 1900.

Application filed December 9, 1898. Serial No. 698,725. (No model.)

To all whom it may concern:

Be it known that I, EDWIN C. WASHBURN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Draft-Rigging for Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to draft-rigging for railway-cars, and has for its object to improve the same in the several particulars hereinafter set forth.

To such ends my said invention consists of the novel devices and combinations of devices set forth in the following description and defined in the claims.

The invention in its preferred form is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a right side elevation with some parts broken away and others sectioned, showing a passenger-coach with my improved draft-rigging applied thereto. Fig. 2 is a plan view of one of the trucks of the car or coach with the cooperating draft-rigging devices applied thereto, the body of the car being indicated by dotted lines. Figs. 3 and 4 are perspective views showing in detail a pair of spring devices for action on the draft-bar of one of the couplers. Fig. 5 is a horizontal section through the draft-box, illustrating also the manner of securing the same to the draft-timbers. Fig. 6 is a transverse section taken approximately on the line $x^6 x^6$ of Fig. 5, with some parts removed. Fig. 7 is a transverse section taken on the line $x^7 x^7$ of Fig. 5, with some parts removed. Fig. 8 is a side elevation of the draft-box removed from the draft-timbers. Fig. 9 is a longitudinal section taken on the line $x^9 x^{10}$ of Fig. 6, with the spring devices in working position. Fig. 10 is a similar section with the spring devices removed. Fig. 11 is a detail in horizontal section, showing a cylindrical seat for one of the spring-rods and also a portion of the said rod. Fig. 12 is a view in diagram, showing the adjacent trucks of two coupled cars and

the intermediate draft connections; and Fig. 13 is also a view in diagram, illustrating a pair of trucks of the same car and the novel draft devices connecting the same.

Of the parts of the coach illustrated in the drawings, 1 indicates the coach-body, having platforms 2 and bolsters 3, and 4 indicates the trucks, having rectangular truck-frames 5 and truck-bolsters 6, the truck-bolsters 6 being pivotally connected to the car-bolsters 3 by means of center-bearing castings 7 and pintles 8.

The draft-bar 9 is provided at its outer end with a coupler-head 10, pivoted thereto, as shown at 11, and provided with the pivoted knuckle 12 and cooperating lock-dog 13, which construction is illustrated and claimed in my pending application, Serial No. 689,289, filed August 23, 1898, entitled "car-couplers."

The inner ends of each of the draft-bars 9 are attached to the draft-timbers 14, which, as is ordinary, are secured to the bottom timbers of the car-body. The draft-box and spring devices by means of which this connection between the draft-bar and the draft-timbers is made will now be specifically described. For these details attention is particularly called to Figs. 5 to 10, inclusive. The draft-box is made up of two sections 15 and 16, the former of which constitutes the sides and top and the latter of which constitutes the bottom and removable section of the said draft-box. The bottom section 16 has perforated lugs 17, adapted to register with depending perforated lugs 18 on the sides of the draft-box body-section 15, and to removably secure the said bottom section 16 in working position nutted bolts 19 are passed through the coincident perforated lugs 17 18. The removable bottom section 16 is further provided with upturned side ledges or flanges 20, that serve as the lower guiding and supporting surfaces for the followers 21. The sides of the body-section 15 are provided with vertical flanges 22, that constitute the intermediate draft-lugs. On both sides of the box-section 15 and on both sides of the pairs of flanges 22 are cooperating draft-lugs 23, formed integral with said box-section. Nutted bolts 24 are passed through the sides of the box-section 15 and through the draft-tim-

bers 14 to secure said box-section to said draft-timbers. The heads of these bolts 24 are located with respect to the draft-lugs 23 so that they are thereby held from turning, and said box-section 15 is provided with bosses or projections 25, that surround the said bolts and extend into the draft-timbers, so that they relieve the said bolts from draft and bumping strains to a very large extent. The followers 21 work between the cooperating draft-lugs 22 and 23, and a heavy coiled draft-spring 26 is compressed between said followers 21. A loose core or stop 27, placed within the coiled spring 26, also serves to limit the movements of the followers 21 toward each other. The draft-bar 9 is provided with the ordinary yoke or pocket 28 at its rear end, which yoke or pocket embraces the followers 21 and cooperates therewith in the ordinary manner. The draft-box section 15 is further provided with a rearwardly-extended cylindrical section 29, that serves as a seat for a secondary spring 30, and this cylindrical extension 29 is provided with perforated ears 31, through which and the draft-timbers 14 a nutted bolt 32 is passed. The ears 31 are preferably embedded into the draft-timbers 14, so that they cooperate to anchor the draft-box to said draft-timbers. The rear end or wall of said section 29 is provided with a central perforation 33, for a purpose to be hereinafter noted, and it is preferably strengthened by webs or flanges 34. Within the seat or pocket formed by the section 29 and just outward of the spring 30 is a loose washer or follower 35, which is of such thickness as to leave a space between the same and the innermost end of the draft-bar yoke or strap 28. Within the coiled spring 30 is a loose core 36, which serves to limit the movement of the washer or follower 35 toward the rear end or wall of the section or seat 29. To permit the rearward or inner movement of the spring pocket or yoke 28, the cylindrical section 29 is cut away, as shown at 37. The lengths of the cores 27 and 36 are such that they will be pressed by the cooperating followers simultaneously, so that the bumping strain will be distributed at different points. However, these cores may be dispensed with and reinforcing-springs substituted in place thereof, in which case the intermediate draft lugs or flanges 22 will be brought into action.

To provide a continuous rigging—that is, a draft-rigging having a connection throughout the train and independent of the body of the car—I employ equalizing-bars 38 and intermediate draft-rods 39. One of these equalizing-bars 38 is passed through a lateral perforation 40, such as is found in the standard Master Car-Builders' continuous draft-bar. The projecting ends of these equalizer-bars of each car are connected by a pair of the said rods 39, which draft-rods have end slots 41, that embrace the ends of said bars 38, with freedom for slight endwise movement, said

slotted ends, as shown, being held in place by pins or cotters 42.

The outer ends of the draft-bars 9 are supported with freedom for lateral movements by means of yoke-like keepers or guides 43, that are bolted or otherwise secured to transverse timbers 44, rigidly secured beneath the car-platforms. Each of these keepers or guides 43 is provided with depending ears or lugs 45, in which a transversely-movable plunger or sliding bolt 46 is mounted. On this bolt or plunger 46 is a pair of flanged thimbles 47, that are pressed against collars 48, fixed on the said bolt or plunger by a strong coiled spring 49, wound on the said bolt. A shipper-bracket 50, provided with upturned lugs or projections 51 and depending ears 52, is mounted to slide against the bottom of the bracket 43. The ears or lugs 52 are perforated, and the thimbles 47 are passed one through each of the same. The bolt or plunger 46 is normally held immovable by a vertically-movable lock-pin 53, which works through a guide-lug 54 and hub portion 55 on one of the depending ears 45 and through a perforation in the said bolt or plunger. The said lock-pin 53 is normally held downward by a spring 56 and is provided with a laterally-turned end 57, adapted when the pin is raised above its operating position to be engaged with a detent or notch 58, formed on the adjacent end of a keeper or guide 43. As shown, the bolt 46 is also provided with a longitudinal groove 59, with which the lower end of the lock-pin 53 is adapted for engagement, as hereinafter described. The shifting spring device just described in connection with the draft-bar keeper or guide 43 is adapted for action on the outer end of the draft-bar in a manner which will be hereinafter fully set forth.

A similar spring device to that just described is mounted on a rectangular bracket 60, which is rigidly secured by bolts or otherwise to the outward transverse portion of each of the truck-frames 5. In this construction the sliding plunger or bolt 61 is mounted for transverse or endwise movement through the ends of said bracket 60 and is provided with the loose headed thimbles 62, pressed against fixed collars 63 by the coiled spring 64. The sliding shipper-bracket 65 has upturned lugs or projections 66 and depending perforated ears 67, through which the thimbles 62 are passed, and is adapted to slide against the inner side of the upper horizontal flange or web of the said bracket 60. Also the said bolt or plunger 61 is normally held against movement by a vertically-movable lock-pin 68, that works through a lug 69 and hub 70 on the said bracket 60 and a perforation in the said bolt. Likewise the said bolt is provided with a longitudinally-extended groove 71, with which the lower end of the locking-pin 68 engages under certain conditions. Again, the said locking-pin 68 is pressed downward by a

spring 72 and has an offturned end 73, adapted for engagement with a notch 74, formed on the upper end of a slotted sleeve projection 75 from the lug 69 or other part of the bracket 60.

The forward end of the draft-bar 9 rests directly in the forward and upturned end of a channel bar or lever 76, the inner end of which bar 76 is, as shown, pivoted on a pin 77, secured to the center-bearing casting 7, close to its pintle or pivot 8. The lugs 51 of the shipper-bracket 50 embrace and engage the outer sides of the free or outer end of the lever or bar 76; and the lugs 66 of the shipper-bracket 65 engage the sides of said lever or bar 76 near its central portion. By means of the two spring devices just noted the lever or bar 76 is mounted for lateral movements transversely of the car and is yieldingly connected both to the body of the car and to the cooperating truck-frame. The purpose of this arrangement will fully appear in the description of the operation.

As shown in Figs. 11 and 13, the two trucks of the given car are yieldingly connected on either side by tension-rods 78, that work through sockets or cylindrical castings 79, rigidly secured near the corners of the rectangular truck-frames 5. The inner ends of the sockets or castings 79 are left open, while the outer ends are provided with transverse slots 80, through which the tension-rods 78 pass. Within each socket 79 is a coiled spring 81, compressed between the headed end 82 of the cooperating tension-rod 78 and a washer 83, loose on the said tension-rod and working against the slotted end of the said socket. The slots 80 permit the tension-rods 78 considerable angular movement, which is necessary when the car is traveling a curve. The said tension-rods when drawn upon compress the springs 81; but under reverse movements they are free to project through the said sockets.

It is a well-known fact that when a car is traveling on a curve the truck-wheels tend to run on lines tangential to the curve of the track, so that under this action the flanges of the outer wheels are caused to scrape the inside of the outer rail with great friction. This is especially so when the train is running at high speed. This action tends to force the wheels to climb onto the outer rail of the curved track and is a frequent cause of cars being derailed in traveling a curved track at high speed. Furthermore, this frictional engagement in all cases makes the train very much harder to draw than would be the case if such frictional engagement could be overcome.

It is one of the main objects of my invention to provide a device which in traveling curves will overcome the above-noted abnormal engagement between the flanges of the outer advance truck-wheels and the outer rail of the curved track, and this I have accomplished by a novel device, the preferred

form of which has already been described in detail and the action of which will now be considered.

Operation: Attention is particularly called to Fig. 12, which shows the front and rear trucks of two coupled cars and illustrates the action of the draft-rigging while on a curved track. Now it will be noted that the coupler-heads will be drawn inward with respect to the curve traveled, or, in other words, toward the inner rail of the curved section of track. This lateral movement of the coupler-heads will of course move laterally the connected draft-bars, and hence also the levers or channel-bars 76. Such lateral movements of the draft bars and levers 76 are effected against the tension of the springs 49 and 64 of the two spring devices illustrated in detail in Figs. 3 and 4. Hence it is evident that these lateral movements of the draft-bars occasioned in traveling curves will draw the outer ends of the truck-frames toward the inner rail of the curved track and will thus tend to draw the flanges of the outermost lead-wheels from engagement with the inner edge of the outer rail of the curved track. To obtain the best action with the spring devices and the levers 76, the spring device 61 64 65 of the rear truck of the advance car should be rendered inoperative by lifting the lock-pin 68 and engaging its portion 73 with the notch 74.

It is of course evident that both of the spring devices above noted act directly on the lever 76 and through said lever indirectly on the cooperating draft-bar and tend to hold said draft-bar in its normal position central of the car, but permit the same to move laterally toward either side of the car within the limits of their compression or within other prescribed limits. Now if two cars are to be coupled while on a curve it will often so happen that the coupler-heads will be engaged at such angles that they cannot be coupled. In such cases the lock-pins 53 and 68 of the spring devices should be raised, and the couplers and their draft-bars may then be moved inward or toward the inner rail, under which action the lower ends of said pins will work in their cooperating grooves 59 and 71, respectively, and will prevent the bolts 46 and 61, respectively, from turning while the said pins are raised. As the bases of reaction for the springs 49 and 64 are thus removed the couplers will stand in their laterally-moved positions until they have been coupled. As soon as the draft-bars are again moved to their normal positions the plungers or bolts will be restored to their normal positions, and the lock-pins will, under the action of their springs, be again and automatically engaged with their seats in the said bolts and will lock the same against movement.

As supplemental to the device above described for drawing the advance ends of the truck-frames inward or away from the outer rail in traveling a curved track, the devices

connecting the truck-frames of the same car are employed. In the construction illustrated the tension-rods 78 and their connections to the truck-frame answer the purpose. By reference to Fig. 13 it will be seen that in traveling a curved track the advance truck is put under strain to turn inward at its front end by the primary devices the action of which was above described, and a very similar strain is put upon the rear truck by the outermost member of the tension-rods 78 and its springs 81. When traveling a straight section of track, neither of the said tension-rods will be drawn upon; but in traveling a curve the outer member is rendered active, as just stated, while the inner member slips through its sockets and becomes inactive for the time being.

It should be understood that while the so-called "primary" and "secondary" devices for steering the trucks or drawing the advance ends of the same inward with respect to a curved section of track cooperate to give the best results, yet that either, if employed alone, will accomplish the desired results and that either is capable of a very large range of modification. In fact, I believe it to be novel to my present invention to provide any means whatsoever whereby in traveling a curved track lateral strains are automatically put upon the advance ends of the truck-frames, tending to draw the same inward with respect to the curve traveled and the flanges of the advance truck-wheels toward the inner rail of the curved track.

The construction of the draft-box is such that the equalizing-bar 38 may be applied in an operative position with respect thereto and to the draft-bar without requiring modification of the Master Car-Builders' standard draft-bar, and, as already described, the said equalizing-bar is passed through a perforation which is always found in draft-bars of the above type.

Under bumping strains the initial movement will be against the primary spring 26. A slight movement inward under the yielding action of the said primary spring will bring the inner end of the pocket or yoke 28 into action upon the secondary spring 30, and further inward movement of the draft-bar and coupler will be resisted jointly by the said primary and secondary springs. As shown, a loose washer 84 is placed between the adjacent ends of the pocket 28 and spring 30, this washer being of less thickness than the normal distance between the said parts.

Under draft or drawing strains the primary or initial pull will be against the tension of the primary spring 26, and the secondary spring of that particular spring device will of course remain idle under such action. However, if the drawing strain is sufficient to compress the primary spring 26 at the advance end of the car the primary spring at the rear end of the car will, through the intermediate continuous draft connections, be compressed

and caused to cooperate with the primary spring at the advance end of the car. If the load is extremely heavy, so that the said two primary springs are sufficiently compressed, the secondary spring at the rear end of the car will also be brought into action and caused to cooperate with said primary springs. As is obvious, by this action a long train will be very gradually and easily started up, and the draft strains are distributed at various points, thus relieving the cars and draft-rigging from unnecessary strains.

As the inner end or wall of the cylindrical extension 29 is provided with the central perforation or passage 33, it is possible to use in connection therewith a single intermediate draft-rod, which rod may be passed through said perforation 33 and suitably connected to the draft devices.

I regard myself as the pioneer inventor of a number of broad features of invention disclosed in this application, and it will be understood that many modifications in construction may be made without departing from the spirit of the invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a car, of a draft-rigging comprising a draft-bar mounted with freedom for lateral movements with respect to the car-body, and a yielding connection such as a spring, between said draft-bar and the adjacent truck-frame, the arrangement being such that lateral strains on the said draft-bar in traveling curves will draw the advance end of the truck toward the center of the arc being traveled.

2. The combination with a car, of a draft-rigging comprising a draft-bar mounted with freedom for lateral pivotal movements with respect to the car-body, a coupler-head pivoted to the end of said draft-bar, and a yielding connection, such as a spring, between said draft-bar and the adjacent truck-frame, said parts operating substantially as and for the purposes set forth.

3. The combination with a car, of a draft-rigging comprising a draft-bar mounted on the car-body with freedom for lateral movements, an intermediate lever pivoted to one of the truck-frames and subject to the action of said draft-bar, and a yielding connection between said lever and the truck-frame, substantially as described.

4. The combination with a car, of a draft-rigging comprising draft-bars mounted on the car-body, with freedom for lateral movements, cooperating intermediate levers pivoted to the truck-frames near their pintle, and spring devices yieldingly connecting the outer ends of the truck-frames with the intermediate portions of the cooperating levers, substantially as described.

5. The combination with a car, of a draft-rigging comprising a draft-bar mounted on the car-body with freedom for lateral movement, and a spring connection between said

draft-bar and the adjacent truck-frame arranged to be thrown out of action at will, substantially as described.

6. The combination with a car, of a draft-rigging comprising a draft-bar mounted on said car-body, with freedom for lateral movements, and a spring device acting on said draft-bar to yieldingly hold the same in its normal position, a lock for said spring device releasable at will and arranged to be reset by a return movement to normal position of said draft-bar, substantially as described.

7. In a draft-rigging, for cars, the combination with a laterally-movable draft-bar, of a spring device acting thereon, consisting of a sliding bracket, a sliding bolt, a spring reacting against said bracket and said bolt, a lock for securing said bolt and means for releasing said lock at will and setting the same subject to the action of said bolt, whereby the movement to normal position of the said bolt will relock the said bolt, substantially as described.

8. In a draft-rigging for cars, the combination with a laterally-movable draft-bar, of a spring device acting thereon comprising a sliding bolt, a sliding bracket having depending perforated lugs, the pair of loose and headed thimbles loose on said bolt and passed through said perforated lugs, the fixed stops on said bolt, the spring acting on said thimbles and pressing the same against said fixed stops, the spring-pressed lock-pin engageable with a seat or perforation in said bolt to lock the same and adapted to be released at will, substantially as described.

9. In a draft-rigging for cars, the combination with a laterally-movable draft-bar, of a spring device acting thereon comprising the sliding bolt having the pair of fixed stops, the longitudinal groove and lock-pin seat, the sliding bracket, a spring, the pair of loose and headed thimbles cooperating with said bracket and normally pressed against said fixed stops by said spring, the spring-pressed lock-pin cooperating with the said longitudinal groove and pin-seat, and a detent with which said lock-pin is engageable to hold it inoperative, said parts operating substantially as described.

10. The combination with a car, of a laterally-movable draft-bar and a pair of spring devices acting on said draft-bar, the one forming a yielding connection between the same and the body of the car, and the other forming a yielding connection between the same and the adjacent truck-frame, substantially as described.

11. The combination with a car, of a laterally-movable draft-bar suitably connected to said car, and a pair of spring devices acting on said draft-bar transversely thereof and tending to hold the same in an intermediate position, one of said spring devices forming a yielding connection between said draft-bar

and the body of the car, and the other between said draft-bar and the adjacent truck-frame substantially as described.

12. The combination with a car, of a laterally-movable draft-bar suitably connected thereto, a pair of spring devices acting on said draft-bar, the one constituting a yielding connection between the same and the body of the car, and the other constituting a yielding connection between the same and the adjacent truck-frame, and means for rendering the said two spring devices independently operative and inoperative at will, substantially as described.

13. The combination with a car, of a laterally-movable draft-bar suitably connected thereto, a lever or intermediate bar pivotally connected to the truck-frame in the vicinity of its pintle, and acting on said draft-bar at its free or outer end, and a pair of spring devices acting directly on said pivoted lever, the one constituting a yielding connection between the same and the body of the car, and the other constituting a yielding connection between the same and the outer end of the adjacent truck-frame, substantially as described.

14. The combination with a car having the ordinary or suitable trucks pivoted thereto, of connections between said trucks whereby, in traveling curves, the pivotal movements of the one truck, will tend to produce corresponding movements of the other truck in the same direction.

15. The combination with a car, of a draft-rigging comprising laterally-movable draft-bars with connections between the same and the car-trucks, and connections between said trucks whereby lateral movements of one of the said draft-bars will tend to produce corresponding movements of both of said trucks, substantially as and for the purposes set forth.

16. The combination with a car, of a draft-rigging comprising laterally-movable draft-bars normally under spring tension to assume intermediate positions, yielding connections between said draft-bars and the adjacent truck-frames, and connections between the sides of the truck-frames of the car, said parts operating substantially as and for the purposes set forth.

17. The combination with a car, of a draft-rigging comprising laterally-movable draft-bars yieldingly held in intermediate positions transversely of the car-body, yielding connections between said draft-bars and the adjacent truck-frames, means for rendering said latter yielding connection operative and inoperative at will, and connections between the said two truck-frames, whereby the pivotal movement of one truck is transmitted to the other, substantially as described.

18. The combination with a car having pivotally-connected trucks, of yielding connections between the two truck-frames, the ar-

5 rangement being such that the pivotal movement of one truck-frame will tend to produce corresponding movements of the other truck in the same direction, substantially as described.

10 19. The combination with a car having pivoted trucks, of connections between the corresponding sides of the two truck-frames, which connections consist of the tension-rods, the seats or pockets for connecting the same to said truck-frames, and the springs applied between said tension-rods and seats or pockets, substantially as and for the purposes set forth.

15 20. In a draft-rigging, the combination with a draft-bar, a draft box or lug device and followers, of a coiled spring compressed between said followers, and a loose core or stop within said coiled spring of less length than the normal distance between said followers, substantially as described.

20 21. A draft-box having integrally-formed sides and top and a removable bottom section and provided with an inward pocket or cylindrical section for the secondary spring device, substantially as described.

25 22. An integrally-formed draft-box comprising the sides, top and cylindrical pocket, in combination with the removable bottom

having ledges or flanges adapted to support the followers, substantially as described. 30

23. The combination with a draft-box provided with draft-lugs, of bolts for securing the same to the draft-timbers, said bolts being passed through perforations in the sides of said draft-box and having their heads located adjacent to certain of said draft-lugs, whereby they are prevented from turning, substantially as described. 35

24. The combination with cars, of draft connections connecting the same and arranged to guide the car-trucks in the same direction, in traveling curves. 40

25. A continuous draft-rigging for cars, comprising draft-bars having attached yokes or spring-pockets, equalizing-bars applied to said draft-bars, connections between the said equalizing-bars, and spring connections between said draft-bars and the car-body, arranged to receive both bumping and draft strains, substantially as described. 45 50

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

EDWIN C. WASHBURN.

Witnesses:

LILLIAN C. ELMORE,
F. D. MERCHANT.