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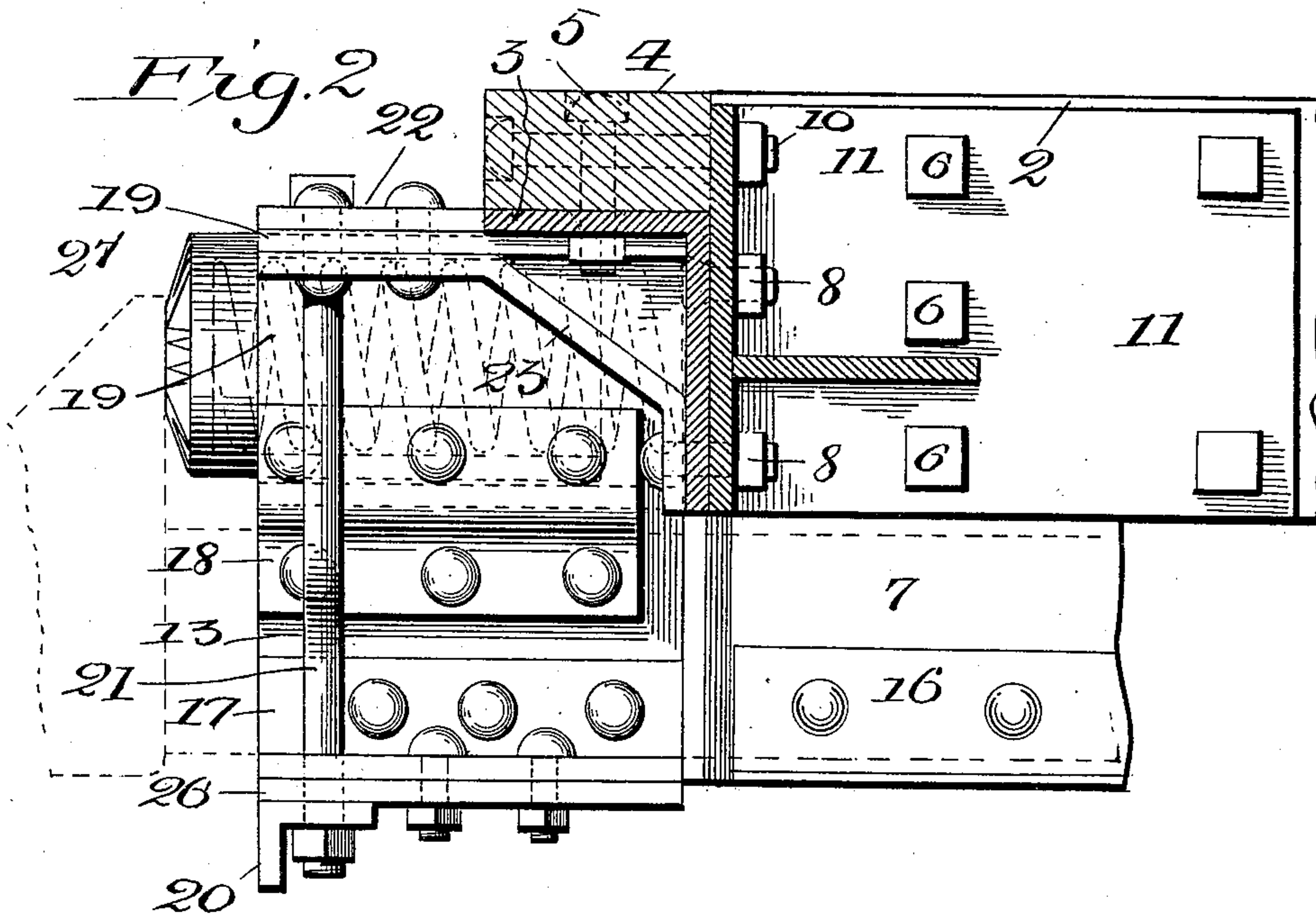
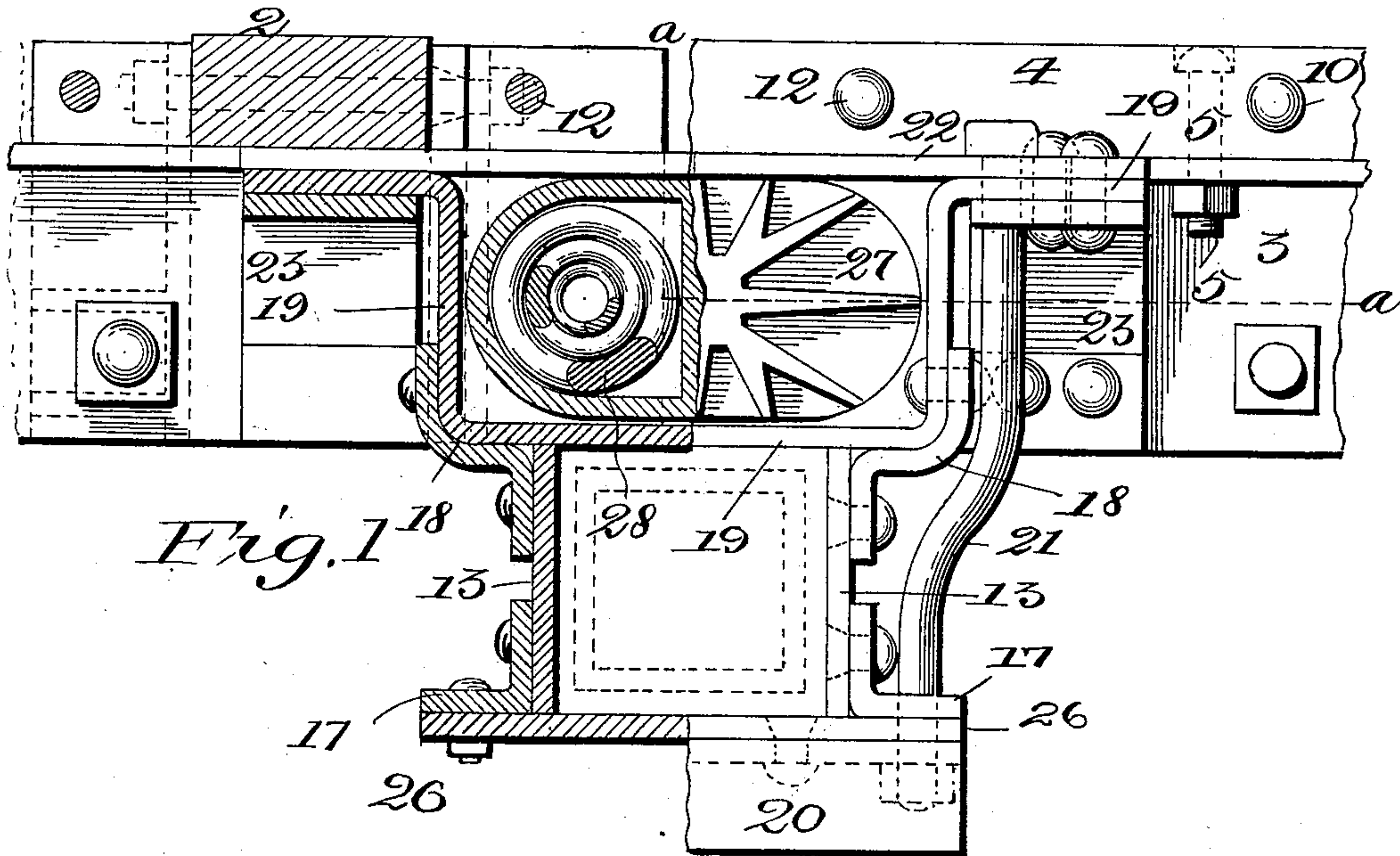
Patented Sept. 19, 1899.

J. S. FRANCIS.
FLOOR FRAME FOR RAILWAY CARS.

(Application filed May 18, 1899.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES:

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K. H. Butler.

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Patented Sept. 19, 1899.

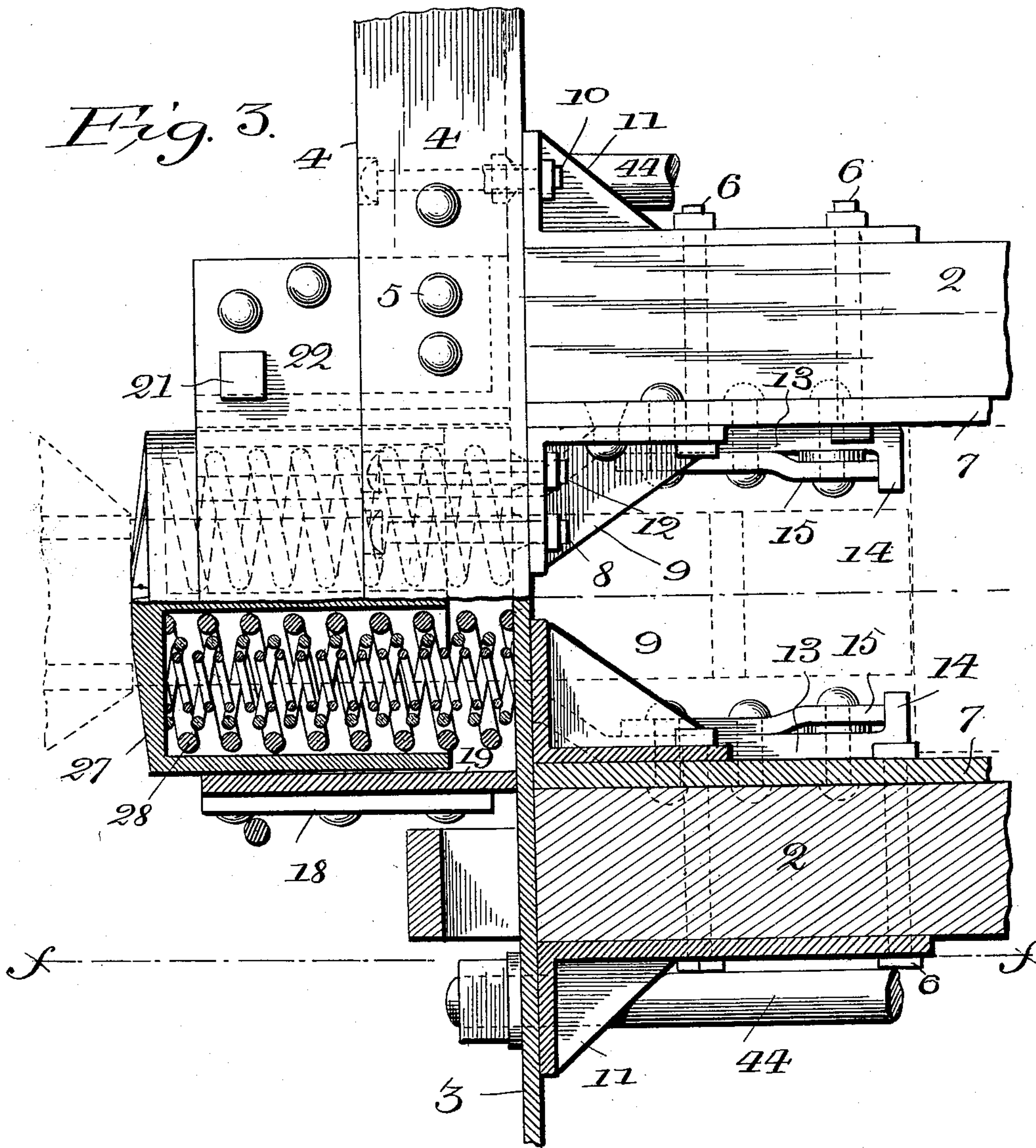
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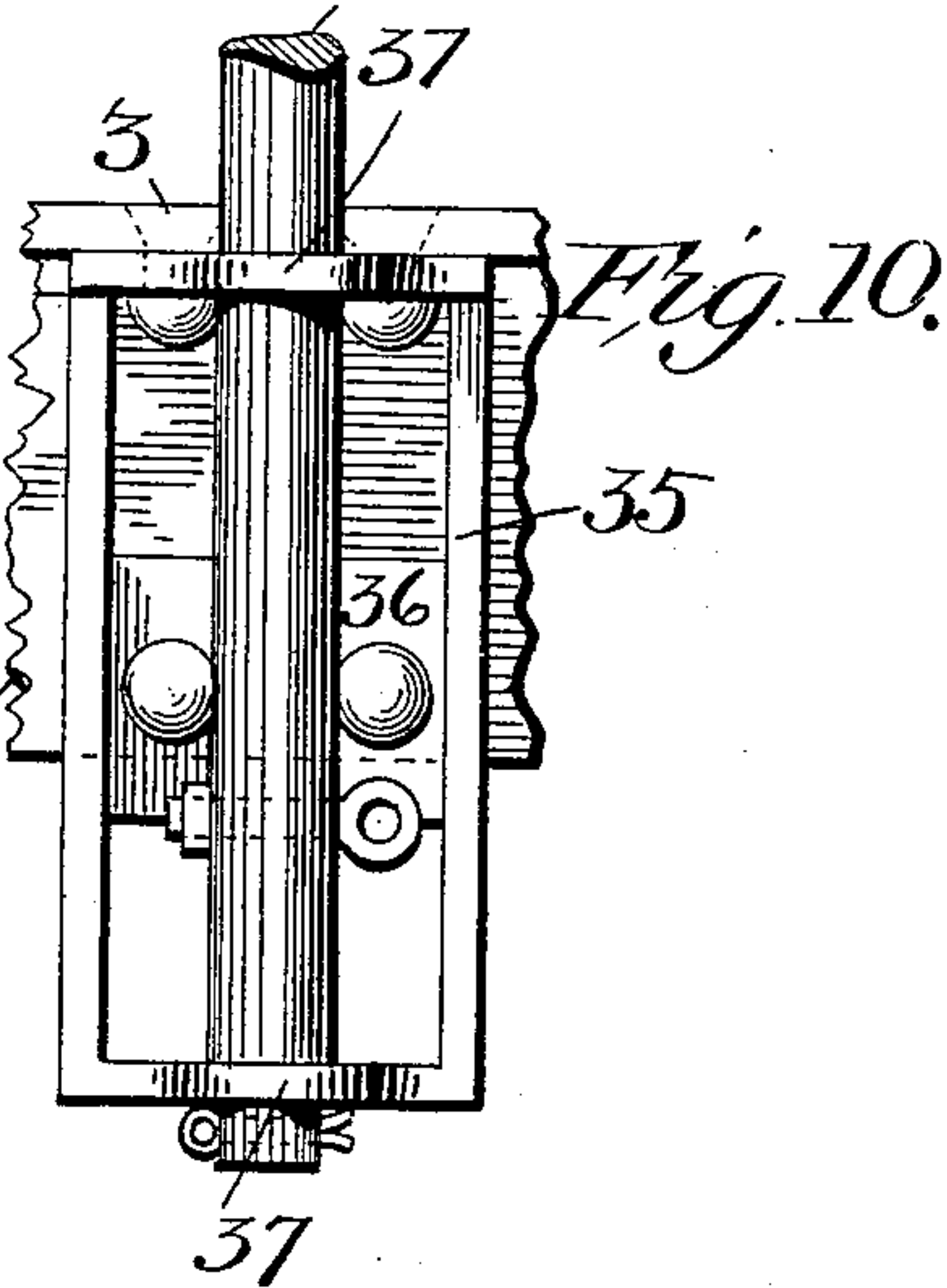
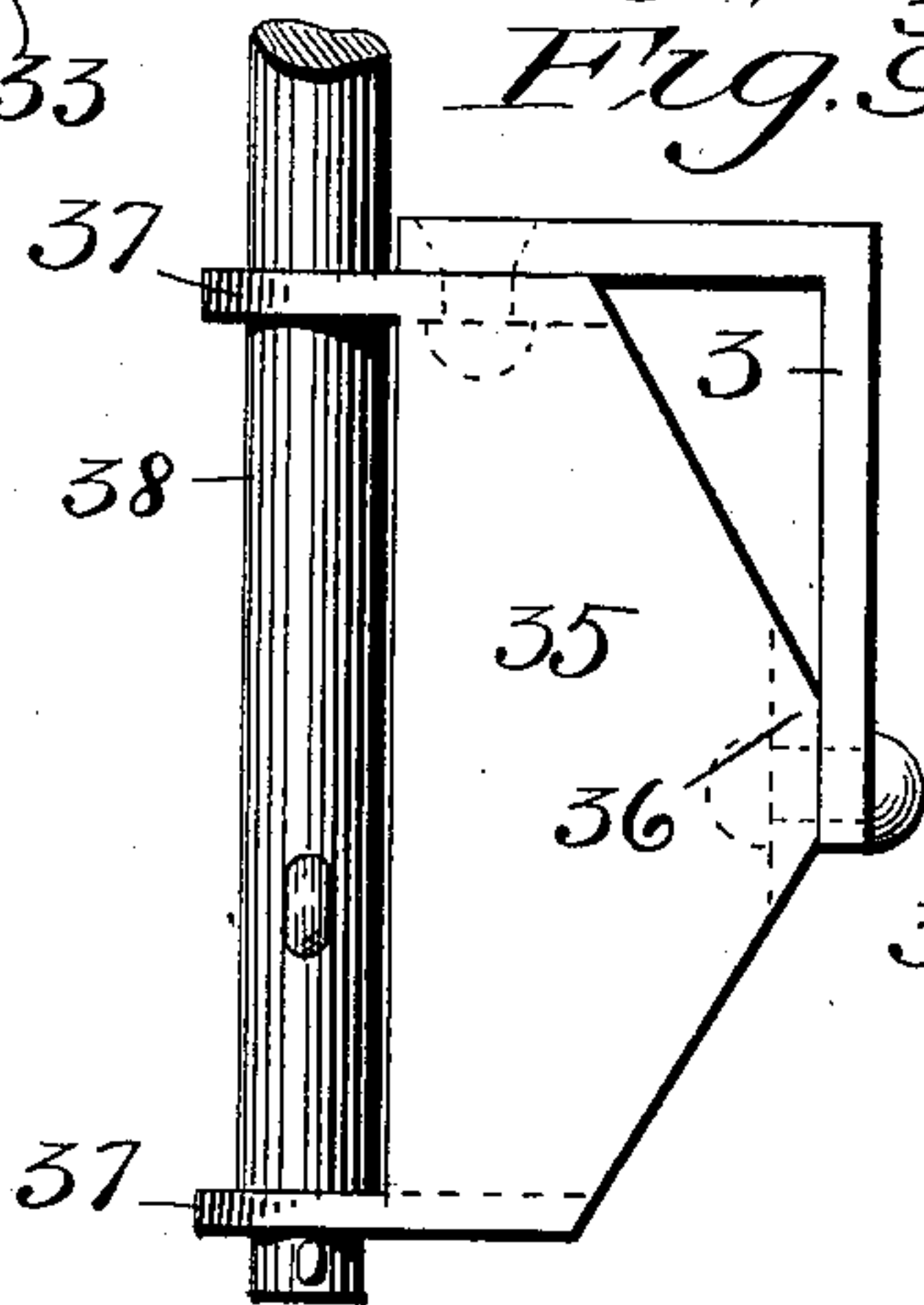
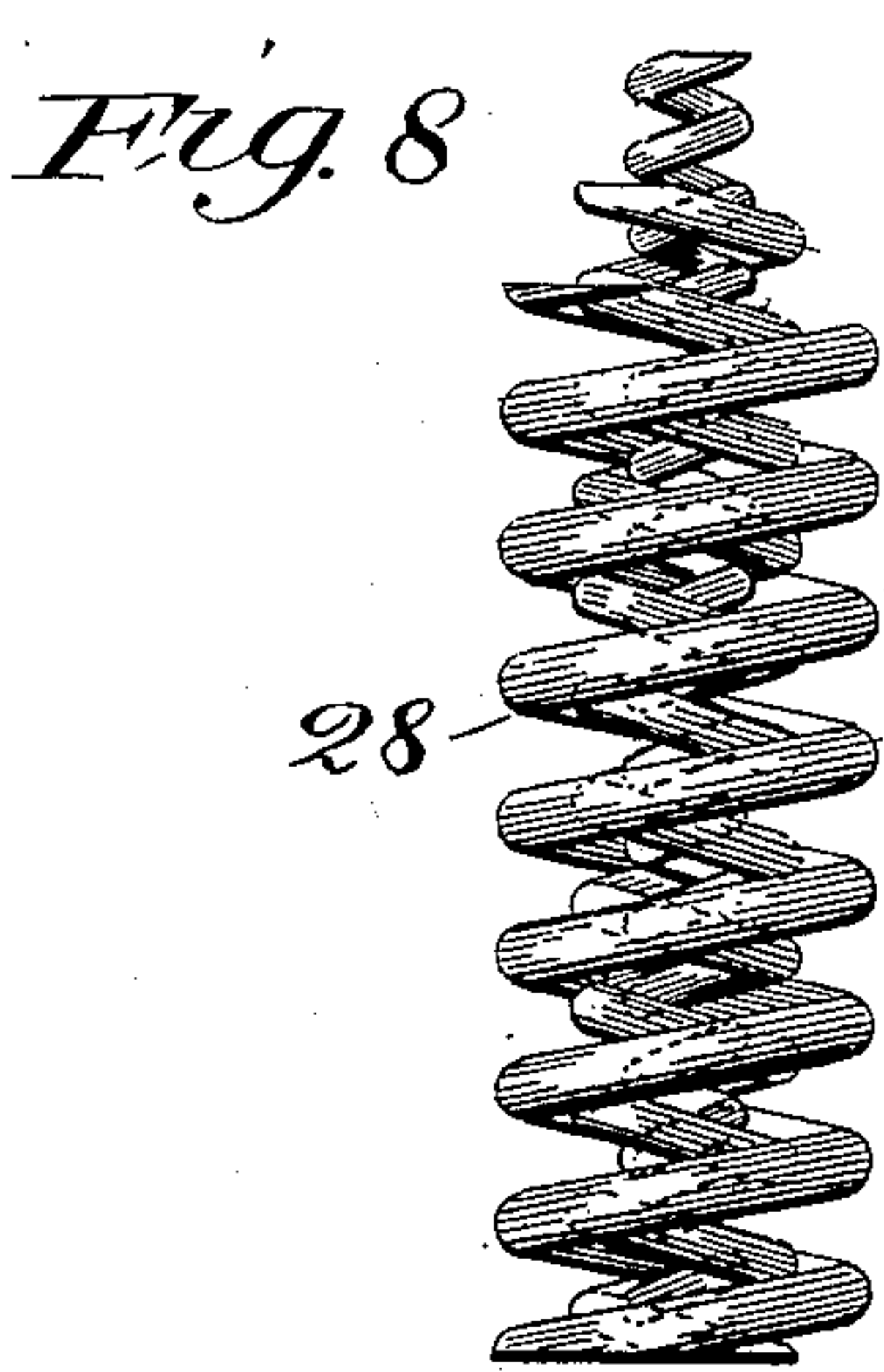
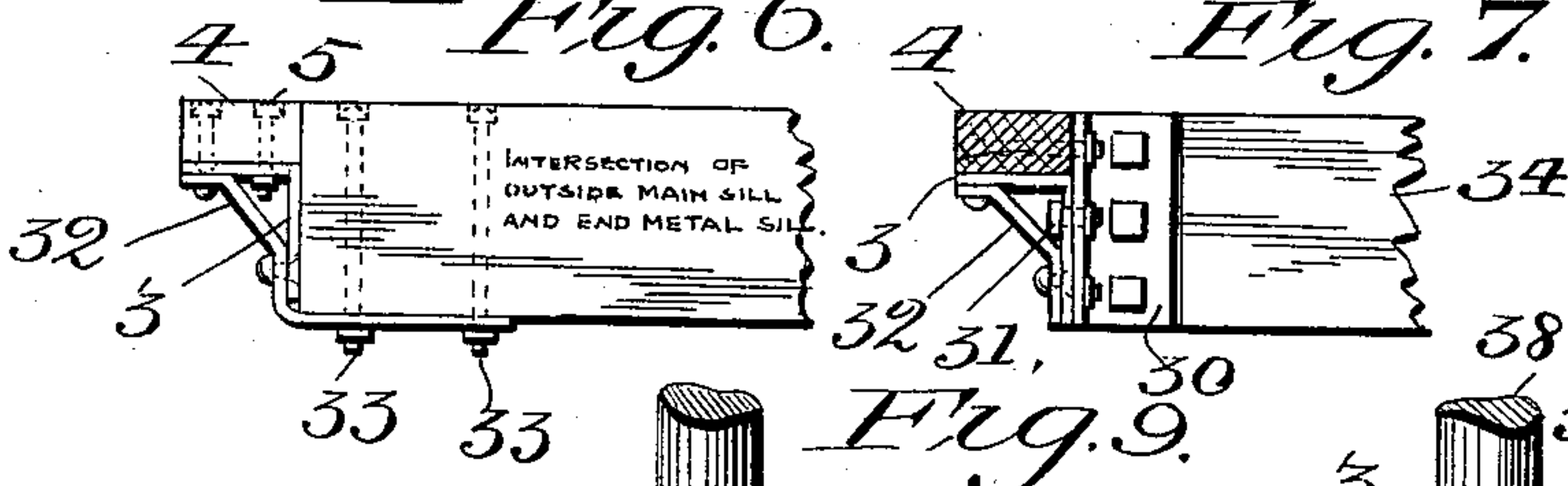
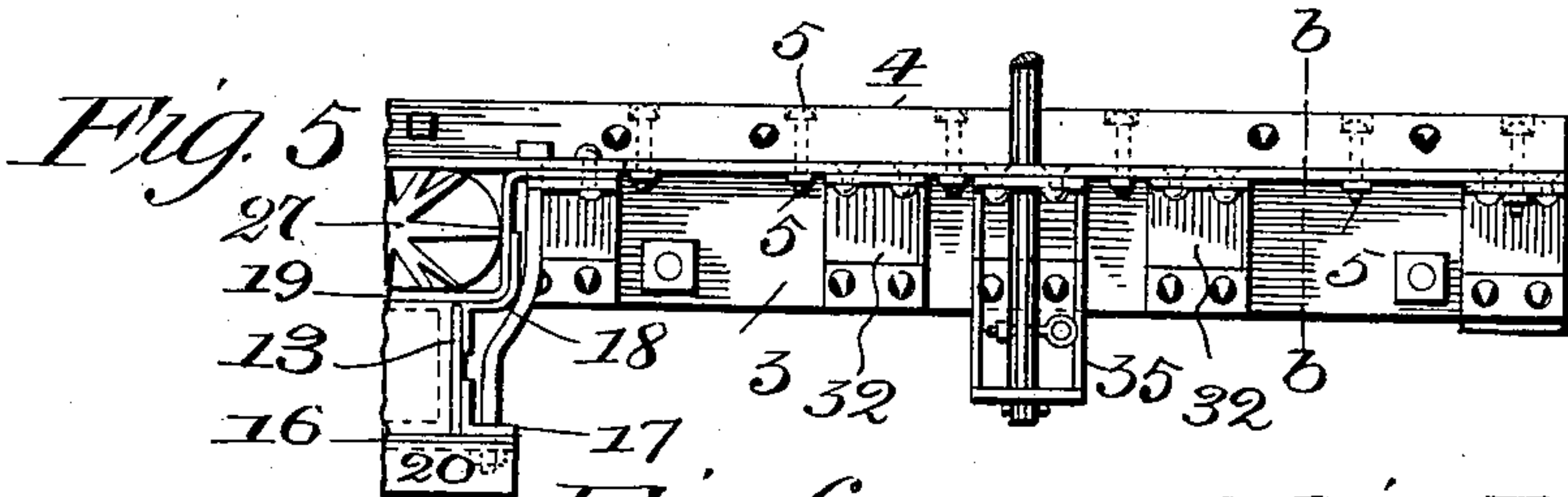
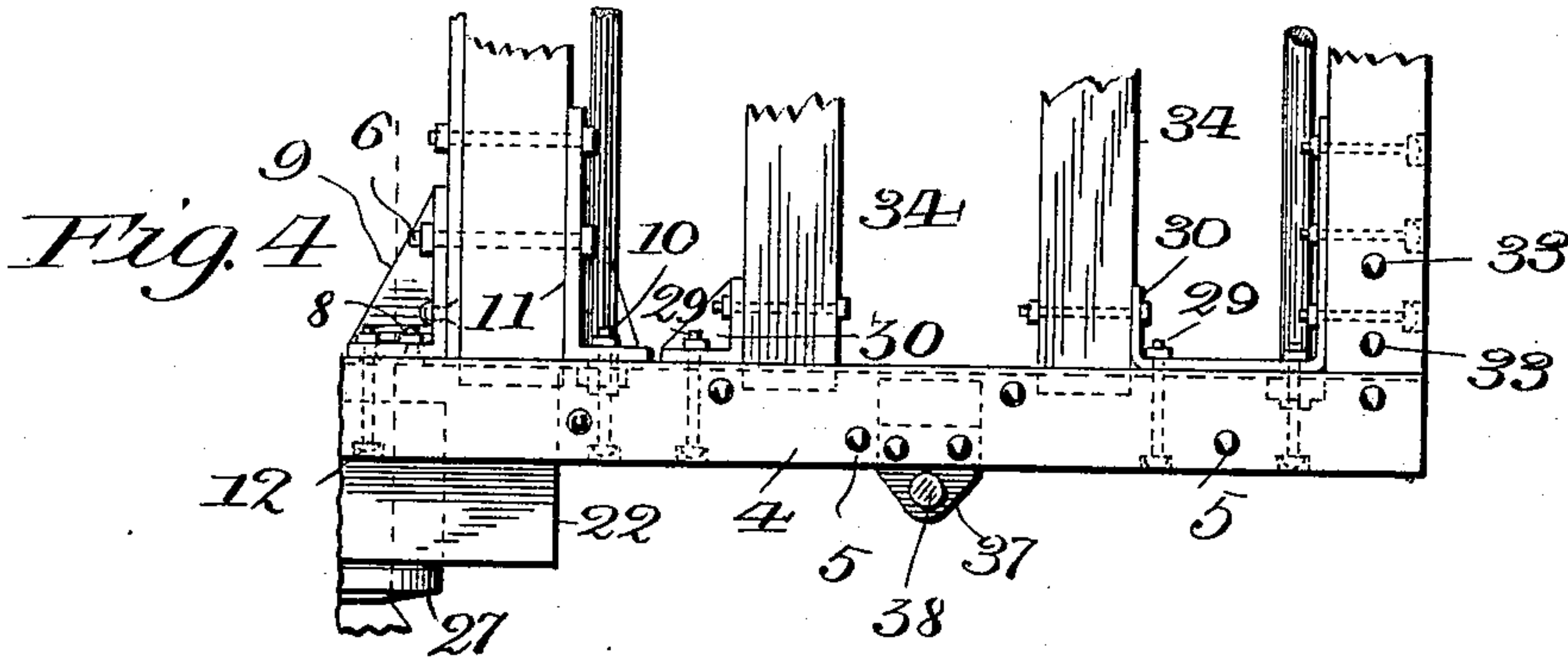
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5 Sheets—Sheet 3.



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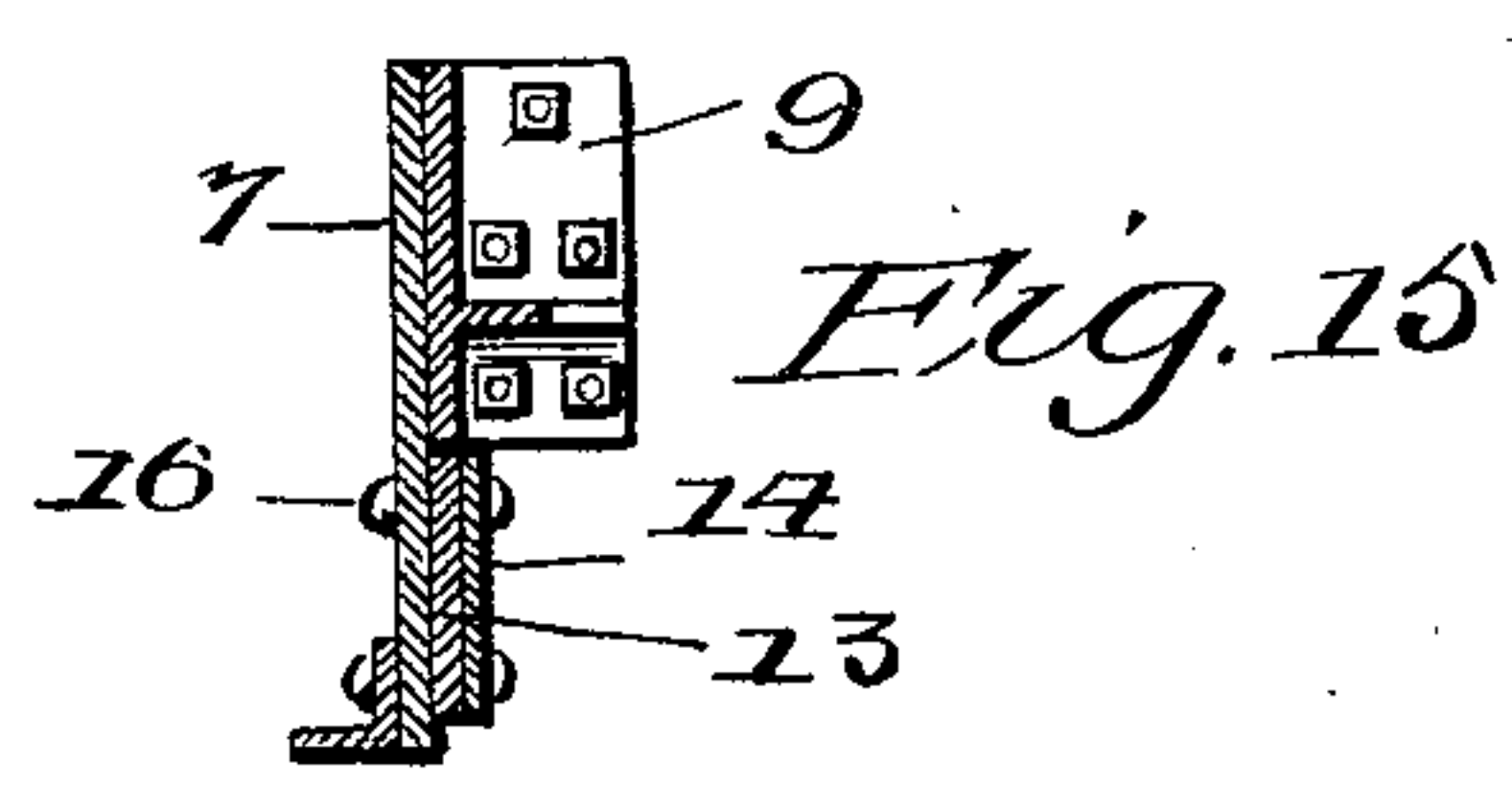
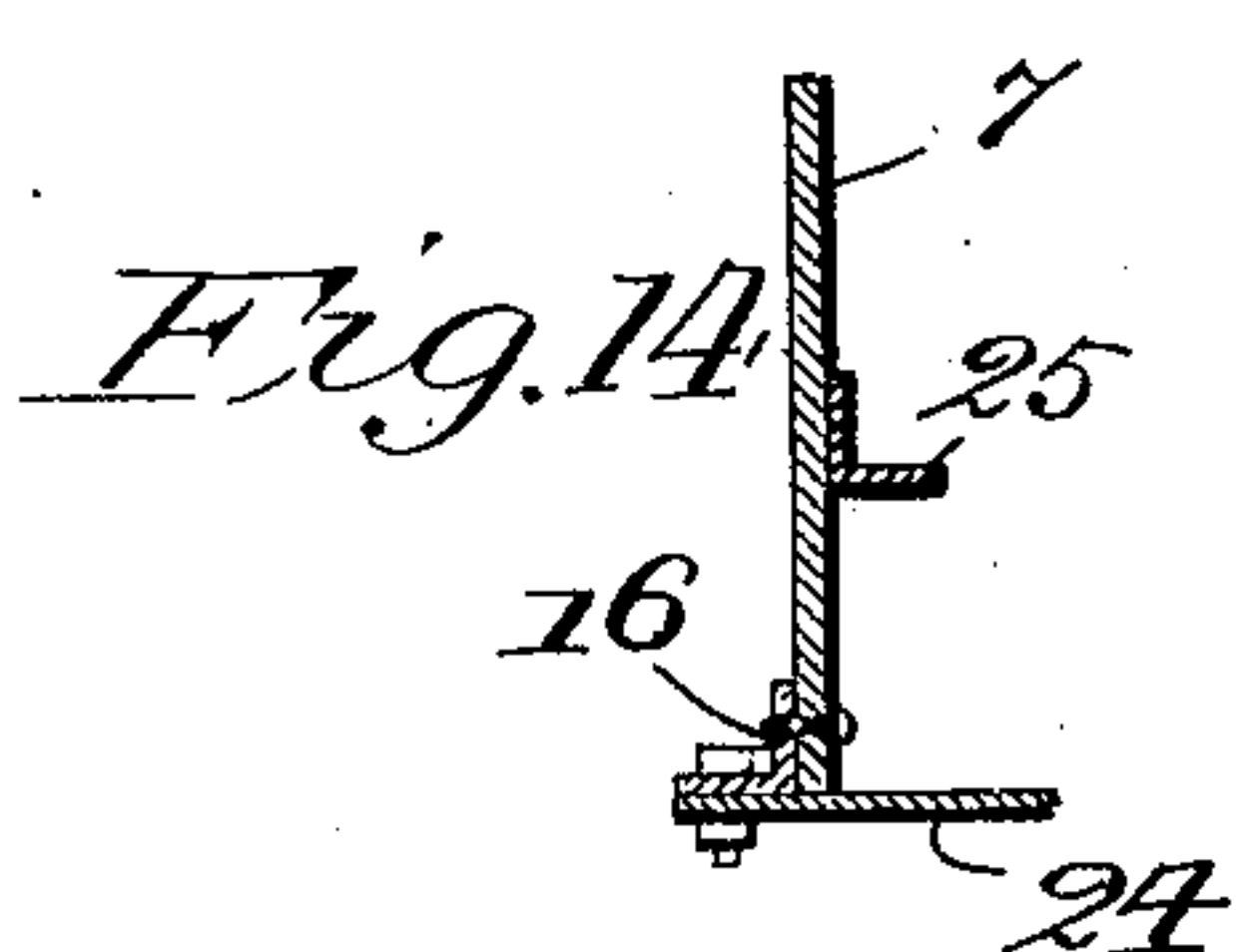
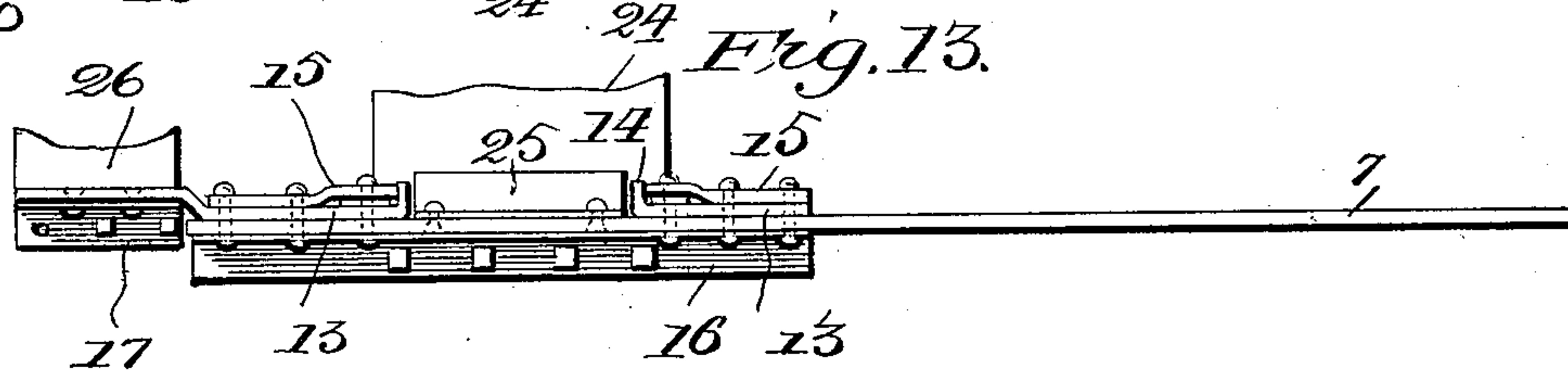
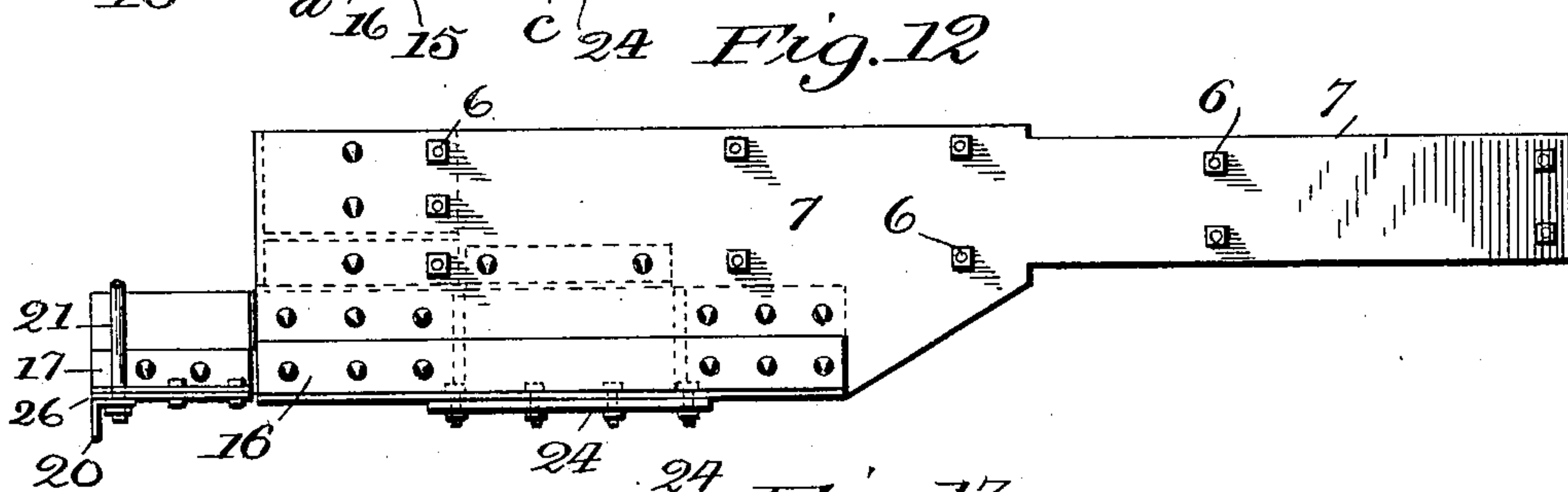
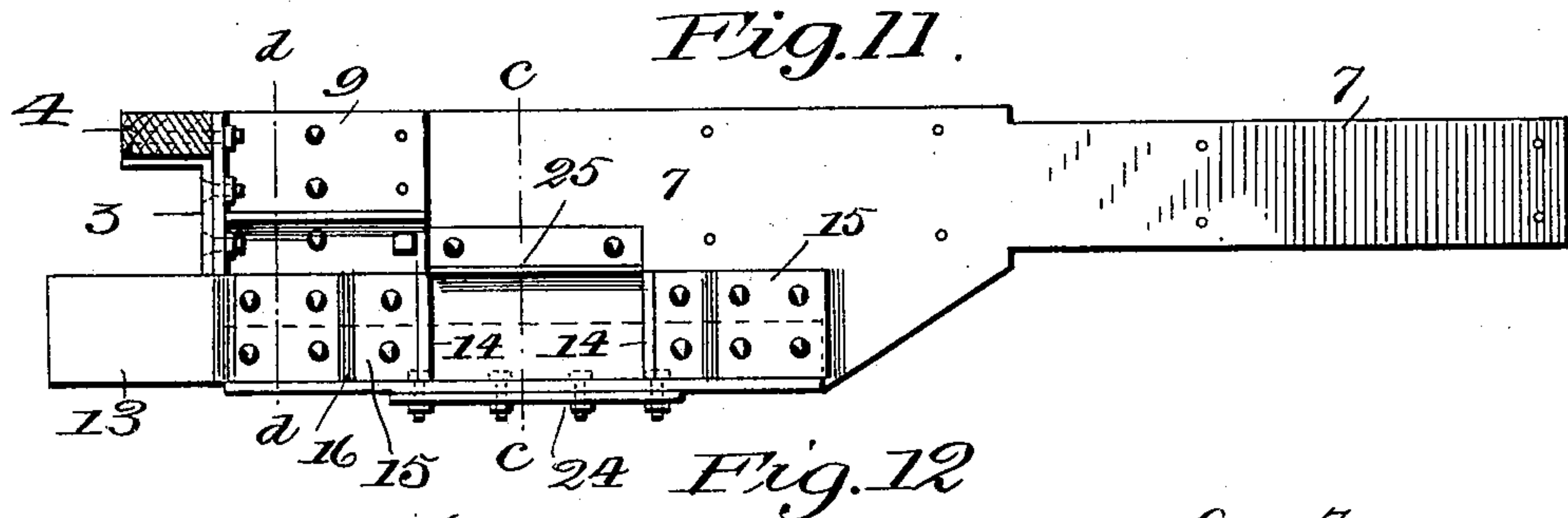
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(No Model.)

5 Sheets—Sheet 4.



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No. 633,377.

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(No Model.)

5 Sheets—Sheet 5.

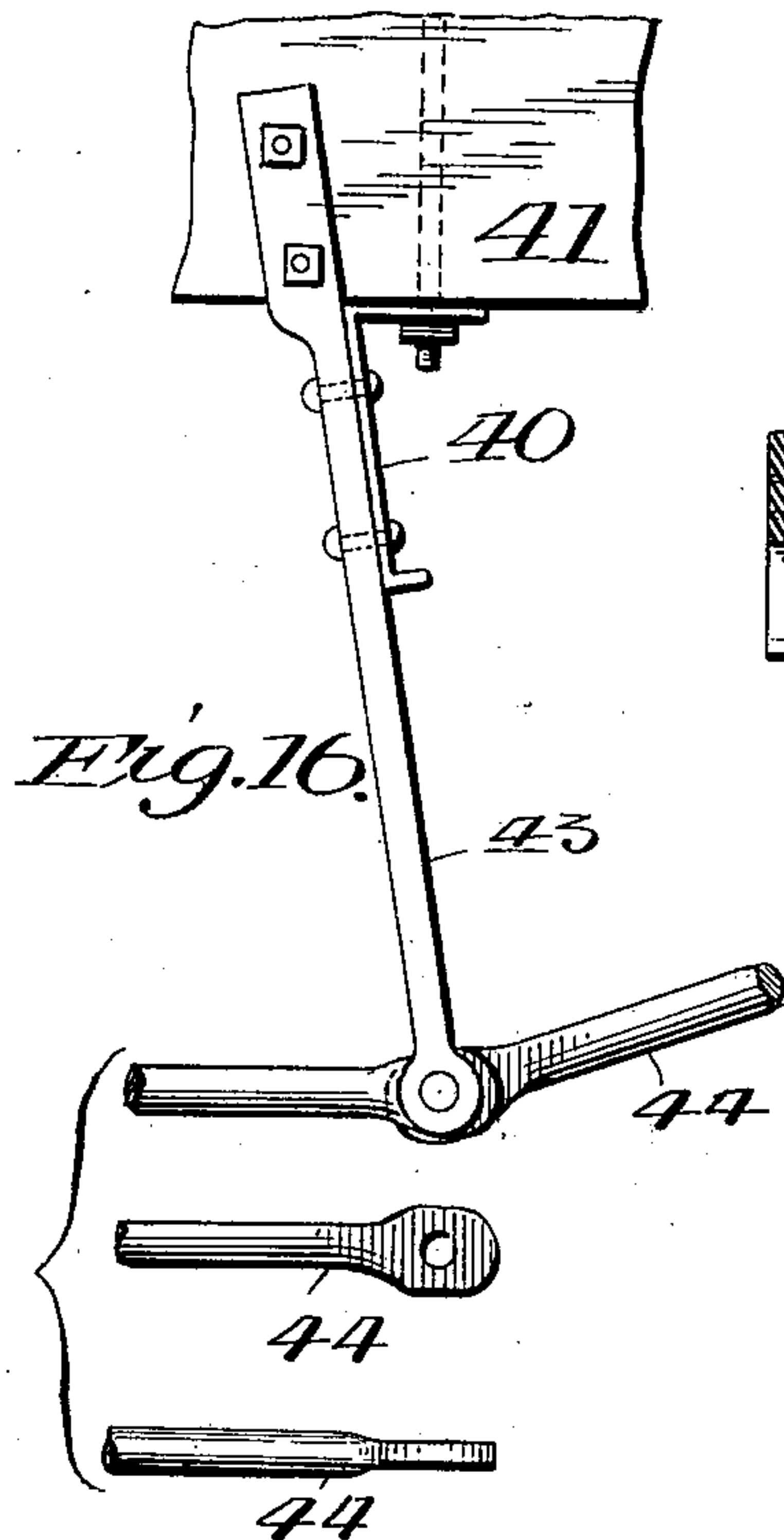


Fig. 17.

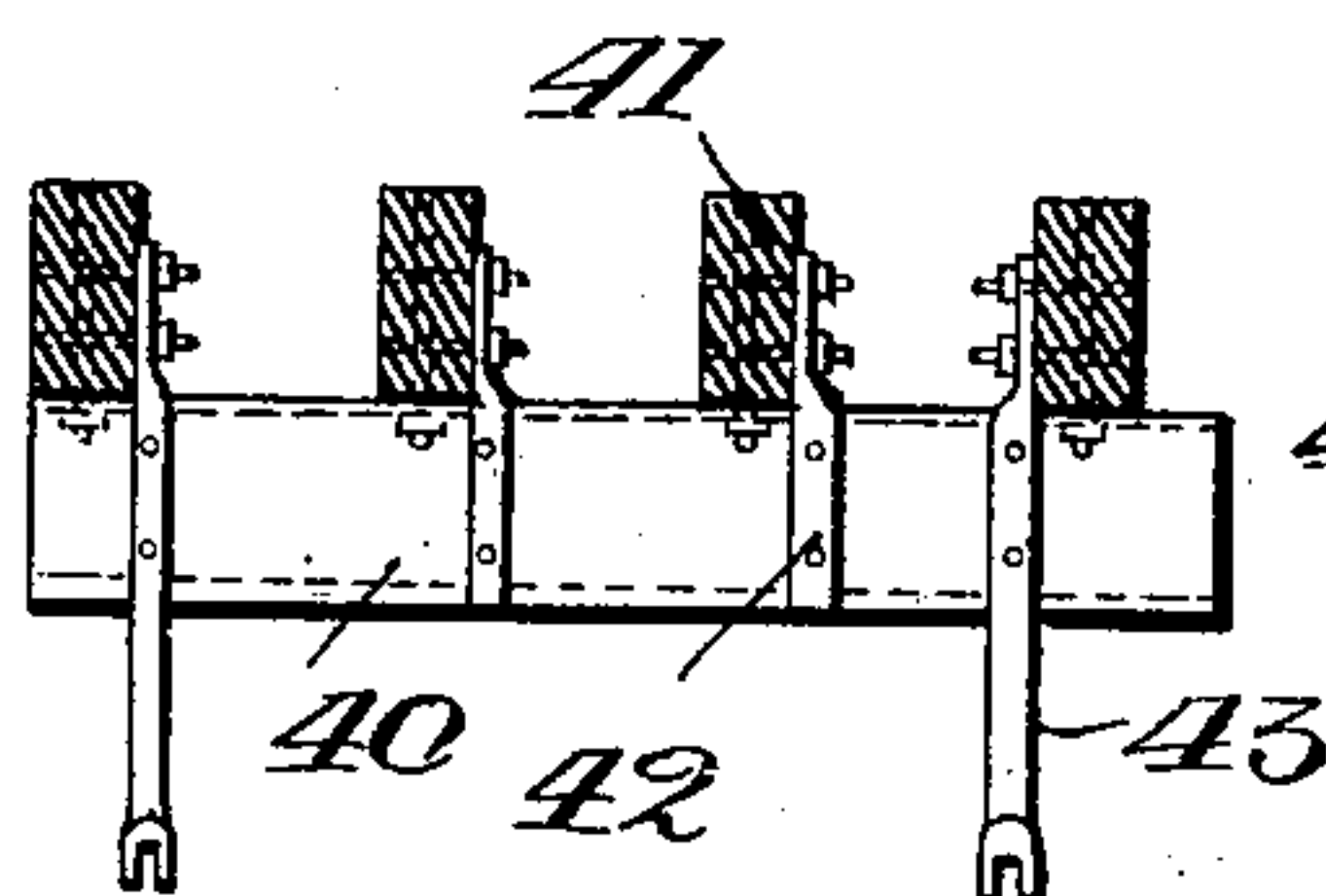


Fig. 18.

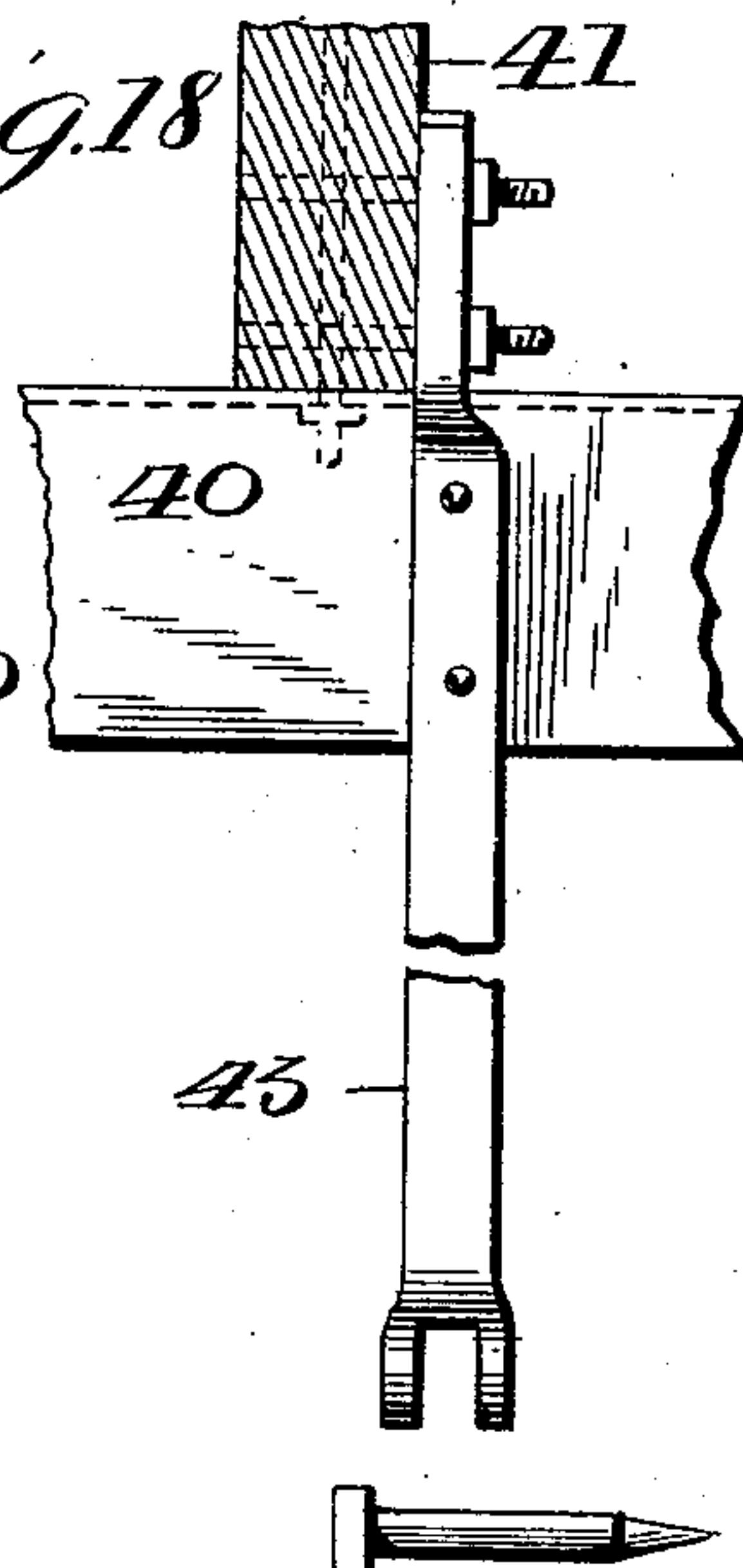


Fig. 19.

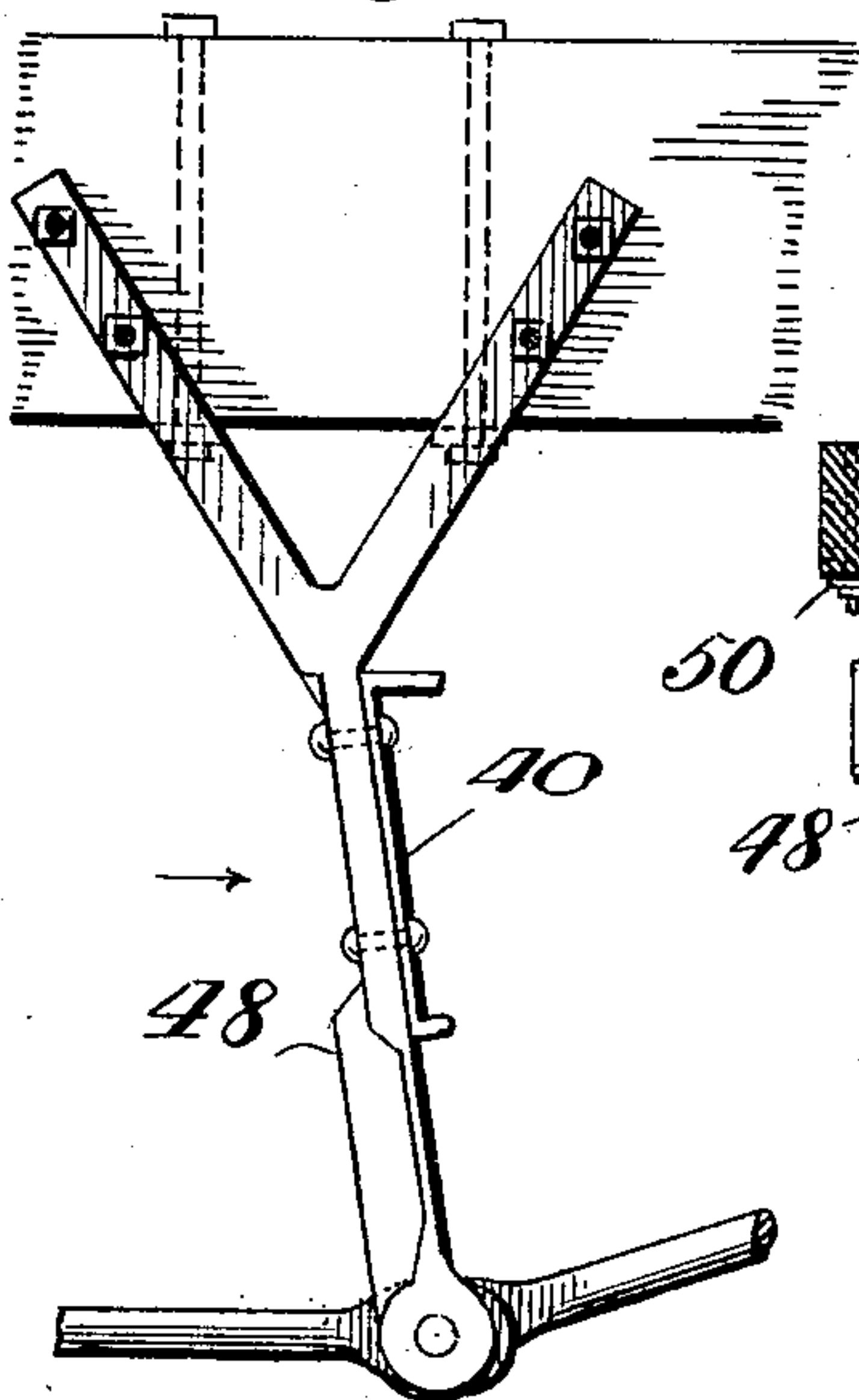


Fig. 20.

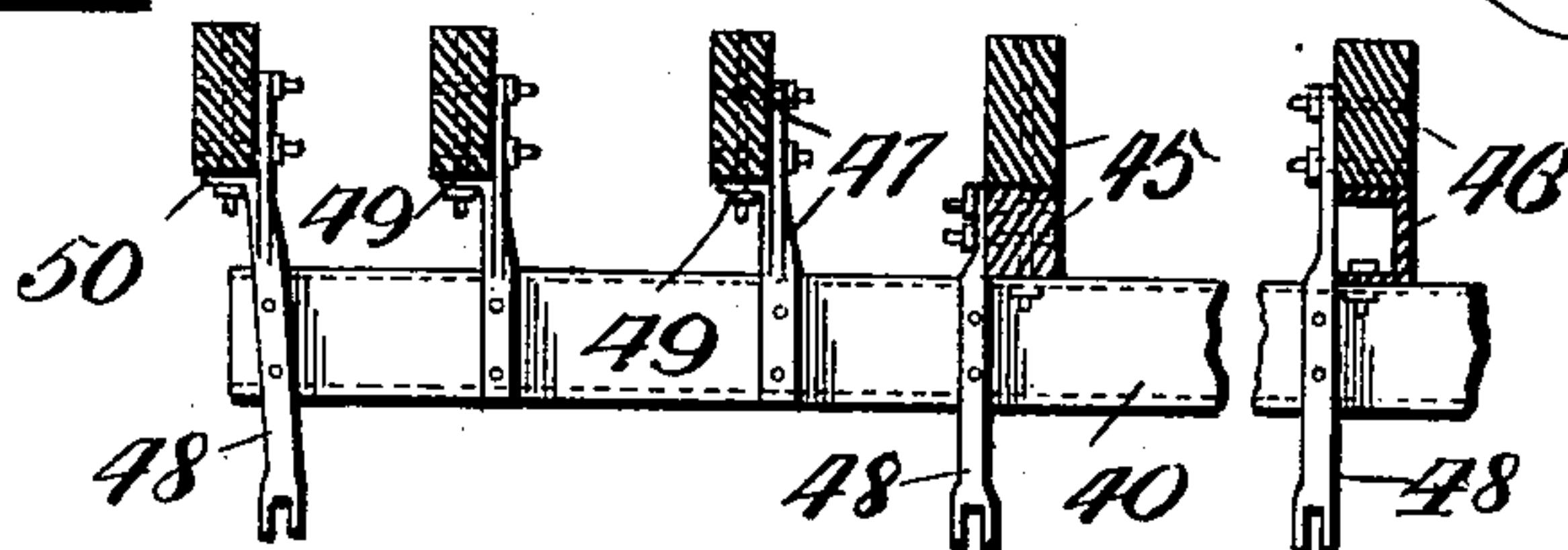
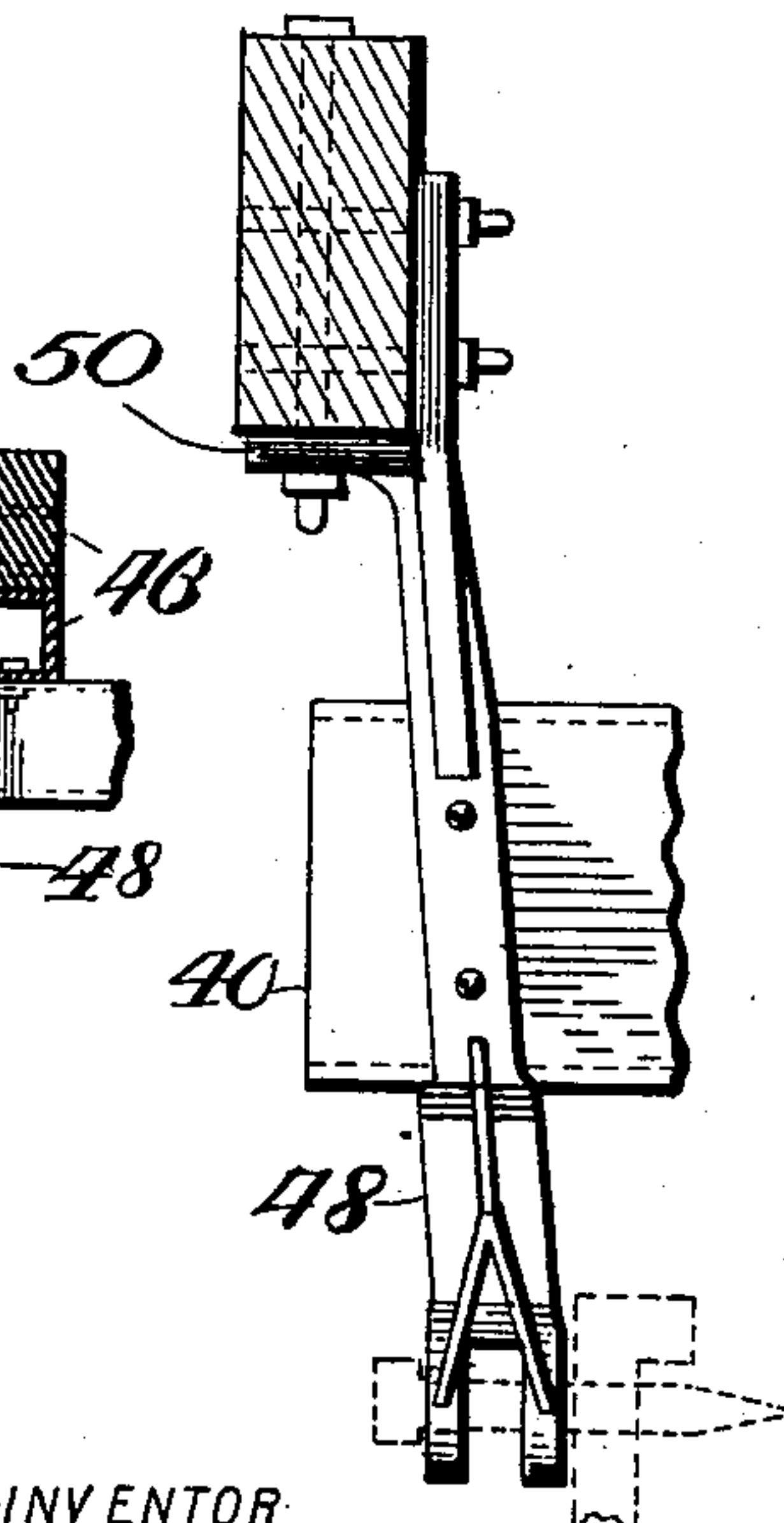


Fig. 21.



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UNITED STATES PATENT OFFICE.

JOHN S. FRANCIS, OF BLOOMINGTON, ILLINOIS.

FLOOR-FRAME FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 633,377, dated September 19, 1899.

Application filed May 18, 1899. Serial No. 717,316. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. FRANCIS, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Floor-Frames for Railway-Cars; 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.

This invention relates generally to railway-cars, and particularly to floor-frames and connected draft-riggings; and it has for its object to provide a simple, durable, and exceedingly strongly connected and braced frame for the draft appliances adapted to withstand the effects of the violent shocks in buffing, due to the greatly-increased weight of modern cars and length of trains; and it consists of the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation in half-section of my invention; Fig. 2, a side elevation of the same, partly in vertical section, on the line *ff*, Fig. 3; Fig. 3, a top plan view, one-half being in section, on line *aa*, Fig. 1; Fig. 4, a detail plan view of one-half of end sill; Fig. 5, a detail front elevation of the same; Fig. 6, a detail side elevation of side, main, and end view of end sill; Fig. 7, a detail vertical section on the line *bb*, Fig. 5; Fig. 8, a detail side elevation of buffer-springs; Fig. 9, a detail side view of brake-shaft step; Fig. 10, a front view of the same; Fig. 11, a side elevation of one side of the draft-plate; Fig. 12, a similar view from the opposite side of the plate; Fig. 13, a plan view of the draft-plate; Fig. 14, a vertical section on line *cc*, Fig. 11; Fig. 15, a vertical section on line *dd*, Fig. 11; Fig. 16, a detail side elevation of the truss-rod support, showing its connection with the body-sill of the car; Fig. 17, a detail side elevation of the metal tie bar or beam, showing attachment of truss-rod supports thereto and the body-sill; Fig. 18, a detail front elevation of truss-rod support; Fig. 19, a detail side elevation of a modified form of truss-rod supports for a draft-timber filling-piece extending from body-transom to body-transom; Fig. 20, a

detail side of metal tie bar or beam and vertical section of body-sills and draft timber or plate filling-piece; and Fig. 21, a detail view looking in the direction of the arrow, Fig. 19.

Similar numerals refer to similar parts throughout all the views.

It is hardly necessary to state that the increase in size of the modern freight-car and the consequent increase of carrying capacity adds greatly to the weight imposed on the substructure of the car, which, together with the increased number of cars to the train permitted by the more powerful modern locomotive, greatly enhances the violence and shock to which they are subjected by the movement of the cars, and in order to enable them to meet these conditions the use of metal as a reinforcement of and as a substitute for wood has been greatly increased in the construction of cars. The use of metal as a reinforcement to wood, particularly in the matter of wooden draft-timbers bolted to wooden body-sills, necessitates the cutting away at different points of the wood, and this, together with the shrinking and splitting or checking of the timber and the decay natural to wood, affords the metal connected thereto an opportunity to gradually work loose and permit of more or less play between the draft-timbers and the metal attachments, which results, as the play between the parts increases in the instance cited, in giving greater leverage to the draw-bar, and thereby greatly increasing the violence of the buffing shock on the draft-timbers, which are damaged and frequently broken and torn away from their foundations as a result.

What is said above with regard to draft-timbers may be applied equally well to all other parts of the draft-rigging and body-frame where wood is employed alone or as reinforced by metal, and it is the purpose of my hereinafter-described invention to obviate generally all such objectionable features and provide a practically all-metal draft-rigging the parts of which are riveted together and may be readily and easily repaired or replaced when necessary without the necessity of disturbing other members of the same, and in case of repairs to draft-irons the latter may be removed for repair or replacement without breaking bulk should the ap-

pliances of a loaded car need repair or replacement.

Referring to the drawings, the numeral 2 represents the center sills of a car, and 3 the metal end sill extending across the ends of said sills. The sill 3 is formed of a single metal plate bent horizontally at right angles, to which is bolted the super or upper wooden sill 4, as best shown in Figs. 2 and 3, by means of vertical bolts 5, countersunk in said sill 4. To the adjacent faces of the center sills 2 is secured by bolts 6 the draft-plate 7, which are illustrated in detail in Figs. 11, 12, 13, 14, and 15 of the drawings, and, as clearly shown, consist of flat elongated bars having their front or outer ends wider than their rear ends or dropping below the same in order to provide for the reception of the draw-bar of the coupler and of its attachment to the car, the said rear narrow ends extending back to, above, and past the transom toward the center of the car in order to reinforce or strengthen the center sills at the points where they are weakened by reason of the attachment thereto of the transom or body-bolster. The end sill 3 is further secured in position by countersunk bolts 8 to the angle-irons or knee-irons 9, which are riveted to the sides of the forward ends of the metal draft-plates 7 and further secured by the bolts 6, which secure said plates 7 to the center sills, as best shown in Fig. 3, thus adding greatly to the strength of the sill intermediate the center sills. The super or upper sill 4 is also further secured, by means of horizontal bolts 10, to the knee-irons 11, which are also secured by the bolts 6 to the center sills, and said sill 4 is also further secured by bolts 12 to the angle-irons 9, as shown in Figs. 1 and 3. To the lower or dropped portion of the forward ends of the draft-plates 7 are secured the plates 13, which are formed with a bent heel or stop 14 at their adjacent ends to form stops for the follower-plates of the draw-bar, said stops or heels being braced or reinforced by cap-plates 15, (see Figs. 3, 11, and 13,) which are riveted through the heel-plates to the draft-plates 7 and to an angle-iron 16, riveted to the outer sides of the draft-plates. At their front ends the plates 13 are extended beyond the ends of the draft-plates 7 and bent inwardly and then straight to form the side walls of the draw-bar stirrup and are connected by a carry iron or plate 26, which is bolted to the angle-irons 17 and which in turn are riveted to the plates 13 at each side; also, a bent plate 18 is secured to said plates 13 and to the housing 19 for the buffer-springs to further brace and strengthen said plates 13. Across the front edge of the carry iron or plate 26 an angle-bar 20 is secured by nuts to the ends of bent vertical-headed tie or brace bolts 21, which extend from the projecting central part or horizontal extension 22 of the end sill 3, which forms the top of the buffer-housing. A diagonal brace plate or iron 23 extends from the vertical wall of the end sill to the hous-

ing 19 and is riveted therethrough to the horizontal extension 22 of the end sill at each side of the buffer-spring housing. The draft-plates 7 are connected and prevented from spreading and the draw-bar supported by a carry iron or plate 24, bolted to the angle-bars 16, as clearly shown in Figs. 11, 12, 13, and 14, and above said plate 24 is riveted to each of the draft-plates an angle-bar 25, which serves to guide the follower-plates in their movement.

The inner stop-plates 13, as shown, are merely flat plates having one end bent at right angles to form the heel or stop 14 thereon.

A buffer-head having two pockets 27 formed thereon to receive the buffer-springs 28 and adapted to telescope in the housing and so arranged as to be in position to be struck or engaged by the top flange or safety-lug, as indicated in dotted lines, Fig. 2, of the draw-head. The buffer-springs 28 for each pocket comprise three springs of different lengths and graduated as to strength and arranged in nested form, whereby they are brought into play according to the violence of the buffing shock on the draft-rigging.

Referring to Figs. 4 and 7, it will be seen that the wooden sill 4 is connected to the intermediate body-sills 34 of the car by bolts 29 passing through the said sill and into knee-irons 30, the outer one of which is also connected to the side sill of the car, and the sill 3 is also secured to the same knee-irons 30 by bolts 31, as shown in Fig. 7, and is braced by the brace-irons 32, riveted thereto, the end ones of which, as shown in Figs. 5 and 6, pass under the side sills and are secured thereto by bolts 33.

To the end sill 3 (see Figs. 9 and 10) is secured the brake-shaft or staff-bearing 35 of rectangular or box form and riveted through its upper wall or top to the horizontal flange of said sill and through a connecting bar or plate 36 at the rear to the vertical part of said sill, as shown in Figs. 9 and 10. The top and bottom plates of the box or bearing are each cast with the projecting lugs 37, having openings therein for the brake-shaft or staff 38.

Referring to Figs. 16, 17, and 18, the numeral 40 designates the metal cross tie bar or beam which is substituted for the ordinary wooden cross tie timber and is suspended from the body-sills 41 by the irons 42, which are riveted thereto and bolted to the intermediate sills, and also by the truss-rod bearings 43 from the side sills and the center sills, said cross bar or beam being angle-shaped, as shown in Fig. 16, and also bolted through its upper flange directly to the body-sills. The truss-rods 44 are made in sections and pin-connected to the saddles of the truss-rod bearings 43, thereby enabling them to be much more easily moved and applied to the car, and also avoiding the use of turnbuckles.

In Figs. 19, 20, and 21 I show my improved manner of attaching the metal tie bar or beam 40 to the body-sills when a wooden filler 45 is

used between transoms or a metal draft-sill 46 is used, as shown to the right, Fig. 20, and passing from one end of the car to the other, in which cases it is necessary to drop the cross tie bar or beam to a lower level, and therefore it is below the line of the bottoms of the intermediate sills a space equal to the thickness of the wood filler or the metal draft-sills, as the case may be. I provide in such cases for a direct and rigid connection between the metal tie-bar and the outside and intermediate sills through the brackets 47 and the truss-rod bearings 48, which are riveted to the metal cross-bar and bolted to the sills.

The brackets 47 are formed with shoulders 49 at right angles thereto, on which rest the bottoms of the intermediate sills, while the truss-rod bearings 48 are bolted directly to the wooden subsill, when one is used, or are formed with a shoulder 50 to support the outside sill when the metal cross-bar is lowered and a filler or subsill is used. The upper ends of the truss-rod bearing are forked, as shown in Fig. 19, and the brackets 47 are similarly formed.

Where the truss-rod connects wooden end sills, as is the common practice, the shrinking of the wood and the wearing away of the same, caused by the washers and nuts used to secure the rods to the sills, permit what is called the "in thrust" of the rod—that is, the weight of the car on the rods between the trucks causes the rods to sag, and thus draw their ends inwardly or toward the center. With metal end sills constructed and arranged as hereinbefore described and connected by truss-rods the sagging of the car and consequent sagging of the rods is wholly prevented, since there is no appreciable wear of the metal.

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

1. A metal draft-plate for railway-cars having its forward or outer end portion of greater width than its rear portion, stop-plates arranged on said outer portion, reinforcing-plates for said stop-plates, and an angle-iron, said parts being riveted together, a guide-plate riveted to the draft-plate, and a draw-bar carrying iron or plate bolted to the angle-iron.

2. A draft-rigging for railway-cars comprising metal draft-plates having their forward end portions of greater width than the center sills to which they are attached, stop-plates, reinforcing-plates bent to engage the stops or heels of said stop-plates, and an angle-iron arranged along the outer side of the draft-plates, all of said parts being riveted together, guide-plates for the follower-plates arranged above said stop-plates, and a draw-bar carry iron or plate bolted to said angle-irons and connecting said draft-plates.

3. A draft-plate for railway-cars consisting of a single plate having its forward portion of a greater width than its rear portion, a suit-

able guide-plate for the follower-plates, and stop-plates, one of the latter being extended to form one of the side walls of the draw-bar stirrup.

4. The combination, in a draft-rigging for railway-cars, of a metal draft-plate of greater width at its forward than its rear end, and a stop-plate secured to said plate and extending beyond the same and parallel therewith.

5. The combination, in a draft-rigging for railway-cars, of draft-plates having broadened outer ends, a draw-bar carry-iron connecting said plates, stop-plates, one of which at each side extends beyond the draft-plates, reinforcing cap-plates for said stop-plates, guide-plates arranged above the stop-plates, a carry-iron connecting the extended ends of said stop-plates, and a bent plate secured to the end sill of the car and forming the top wall of the draw-bar stirrup.

6. An end sill for railway-cars formed of plate metal and bent at right angles and having a central horizontal extension.

7. The combination, in a draft-rigging for railway-cars, of metal draft-plates, a metal end sill formed in right-angled shape, a wood upper sill bolted to said end sill, and angle-plates or knee-irons securing said end sill and upper sill to the draft-sill.

8. The combination, in a draft-rigging for railway-cars, of metal draft-plates, a metal end sill formed of right-angled shape, an upper wood sill, bolted to said end sill, angle-plates or knee-irons securing said end sill and wood sill to the draft-plates, and knee-irons securing said parts to the center sills.

9. The combination, in a draft-rigging for railway-cars, of metal draft-plates, a right-angle-shaped metal end sill having a central horizontal extension, a wood upper sill, knee-irons connecting said metal and wood sills to the draft-plates, and a bent plate riveted to the central extension of the end sill and forming therewith the buffer-spring housing.

10. The combination, in a draft-rigging for railway-cars, of metal draft-plates, an angle-shaped metal end sill having a central horizontal extension, angle or knee irons securing said plates and end sill together, a bent plate having its ends secured to the extension of the sill, and a draw-bar stirrup supported from the said end-sill horizontal extension, whereby said extension and bent plate form the housing for the buffer head and springs.

11. The combination, in a draft-rigging for railway-cars, of metal draft-plates, an angle-shaped metal end sill having a horizontal central extension, a bent plate having its ends secured to said central extension and forming therewith a housing, graduated springs arranged in nested form in said housing, and a buffer-head having pockets adapted to in-

close said springs.

12. A brake-shaft or staff-bearing formed of a single rectangular casting having side walls connected together by a bar or plate,

top and bottom walls, and horizontal perforated lugs projecting from said top and bottom walls.

13. The combination, with body-sills of a railway-car of a metal tie bar or beam, bolted to the under sides of said sills, brackets connecting the sides of said tie bar or beam to the sides of the intermediate sills, and truss-rod bearings of a bracket form connecting
5 said tie-bar and the side sills of the car.

14. The combination, with the body-sills of a railway-car, of a metal tie bar or beam arranged below the plane of the bottoms of the sills, brackets riveted to said tie bar or beam
15 and bolted to the sides and bottoms of the intermediate sills, and truss-rod bearings similarly secured to the side sills and the tie bar or beam.

15. The combination, with the side sills of

a railway-car of a metal tie bar or beam 20
dropped or arranged on a plane below the bottoms of said side sills, a filler-piece arranged between said sills and the tie-bar, and truss-rod bearings connecting said sills and the tie bar or beam.

16. The combination, in a floor-frame for cars, of metal end sills, center sills, draft-plates, knee-irons rigidly securing said end sills to said center sills and draft-plates, and truss-rods having their ends secured to said
25 end sills.

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

JOHN S. FRANCIS.

Witnesses:

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