

No. 705,943.

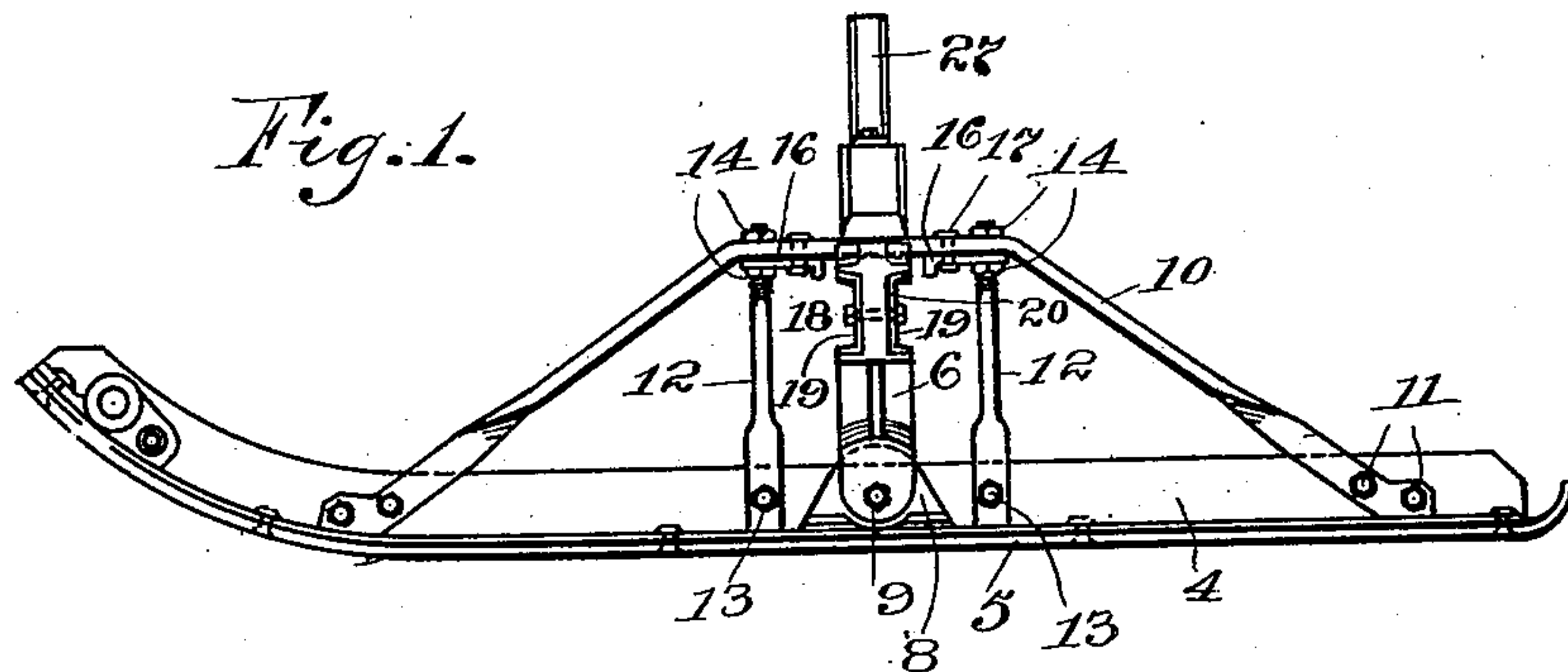
Patented July 29, 1902.

C. MILLER.  
SLED.

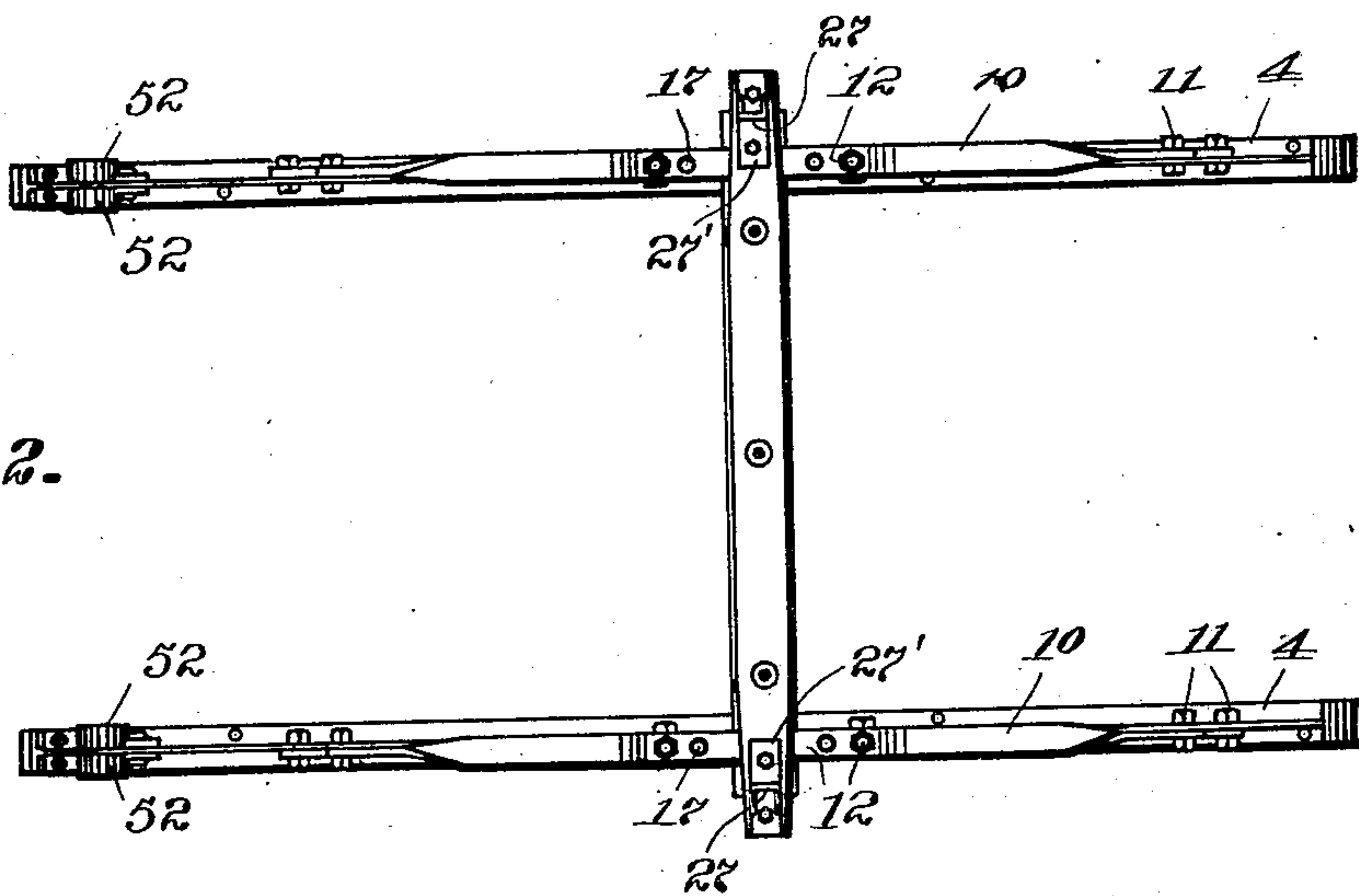
(Application filed May 17, 1900.)

(No Model.)

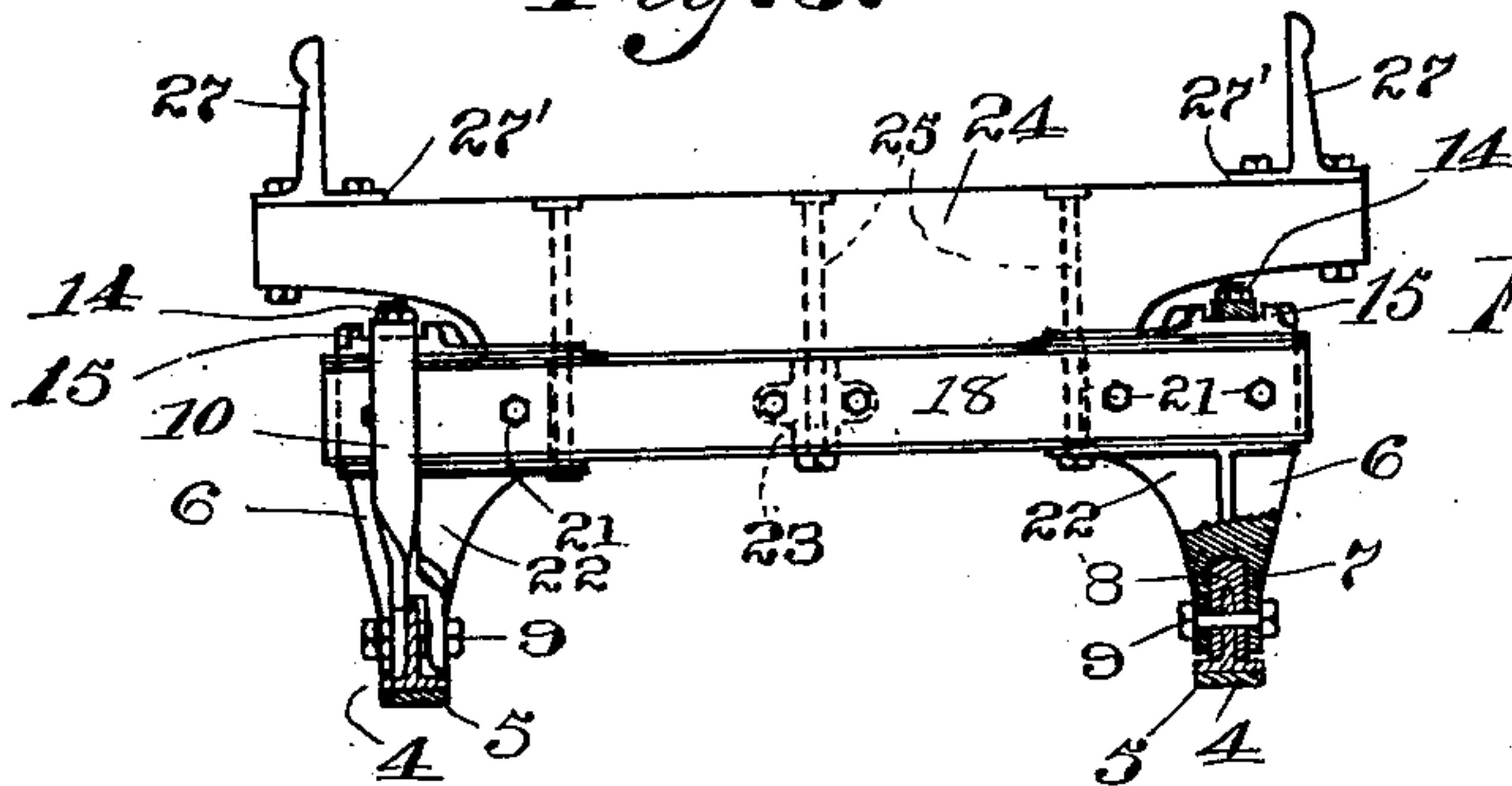
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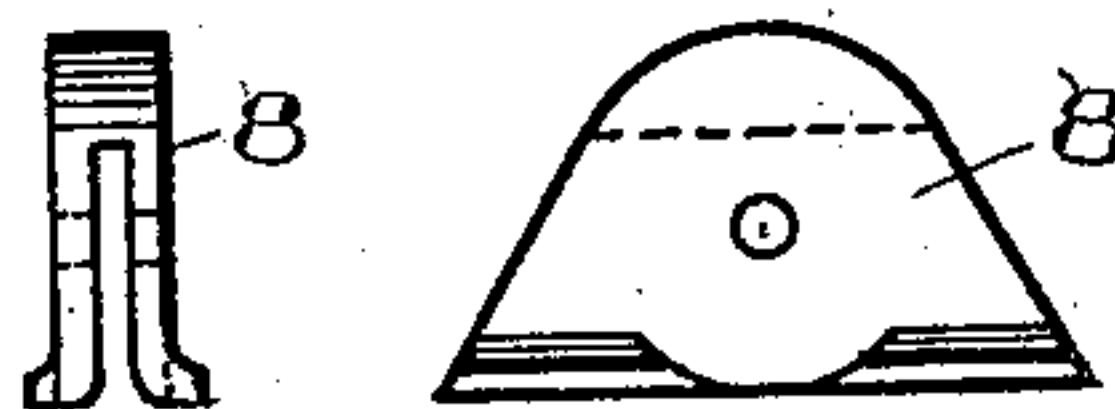
*Fig. 2.*



*Fig. 3.*



*Fig. 13. Fig. 14.*



Witnesses  
Marcus S. Byng.  
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Corrad Miller, Inventor  
By his Attorney  
*[Signature]*

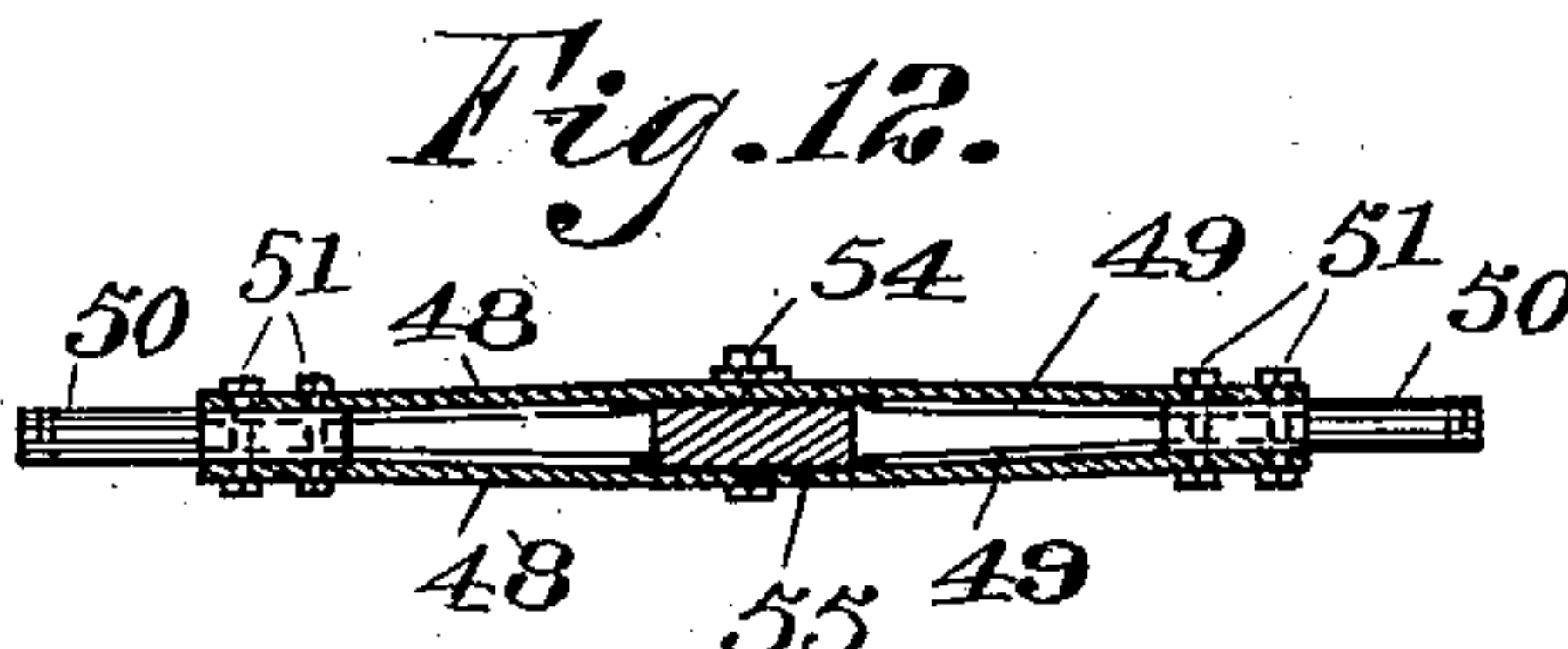
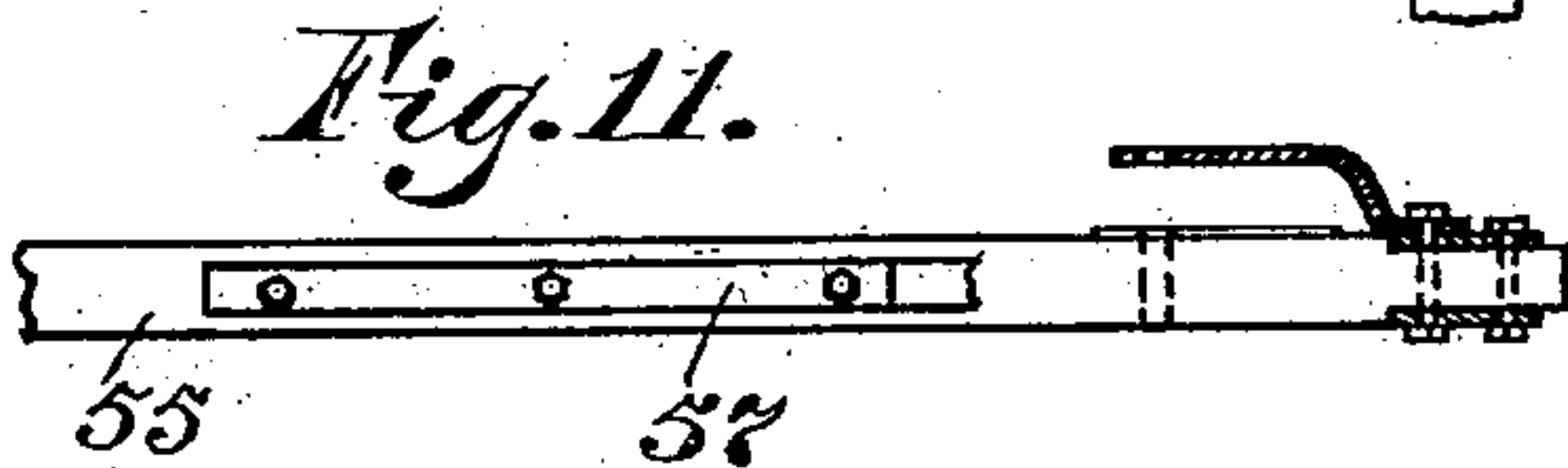
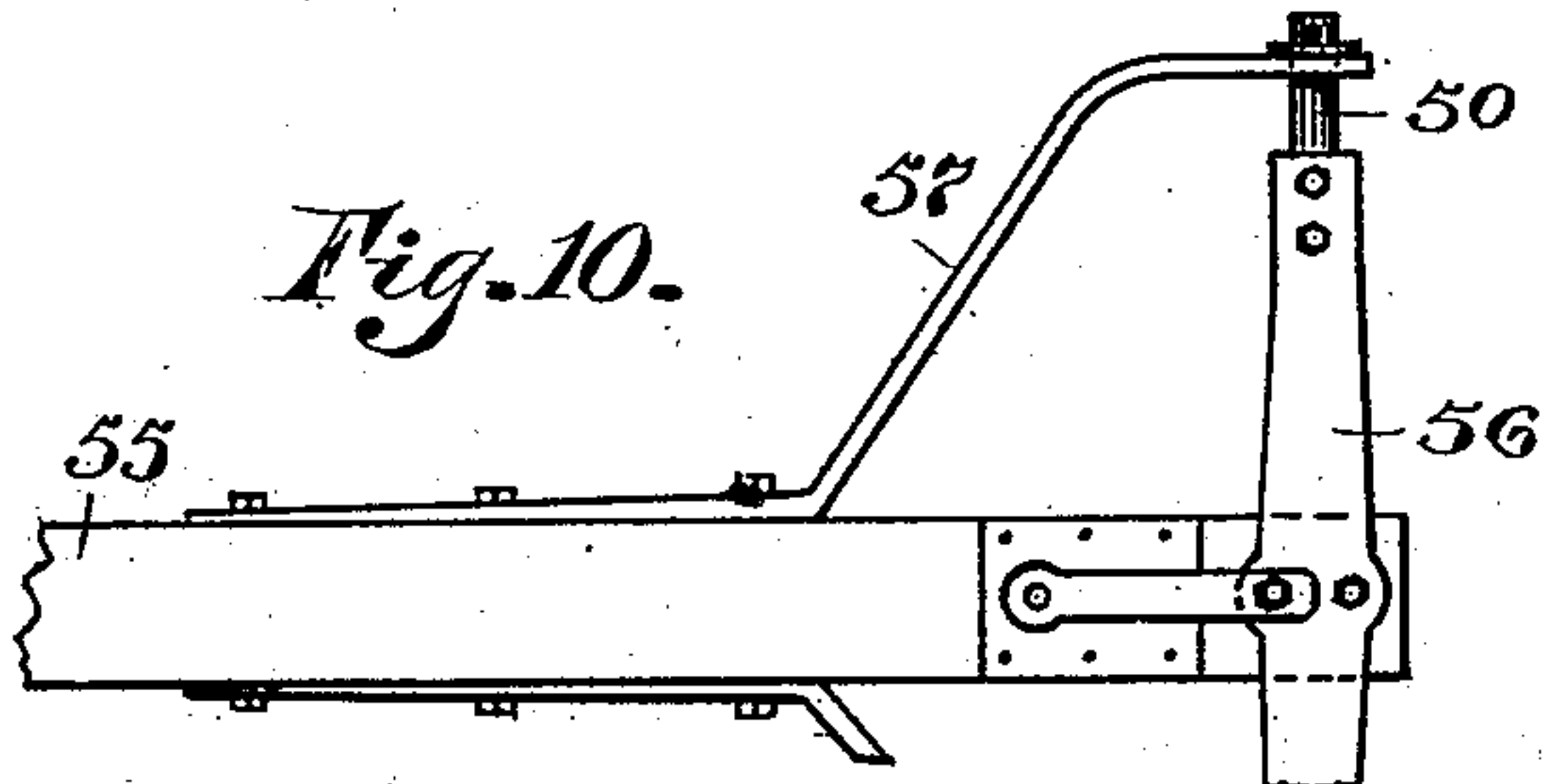
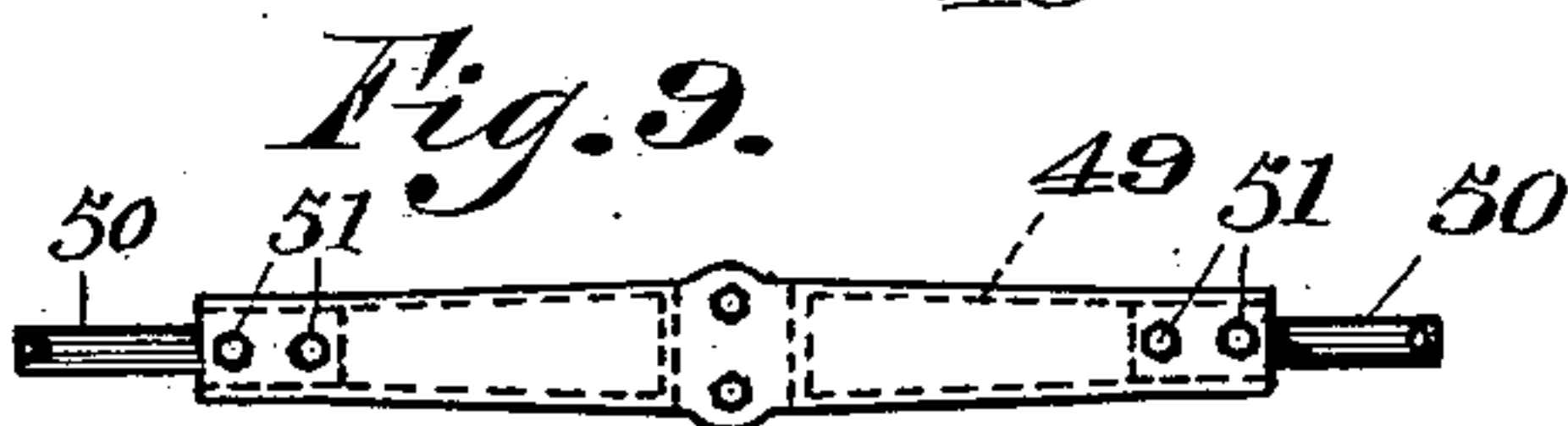
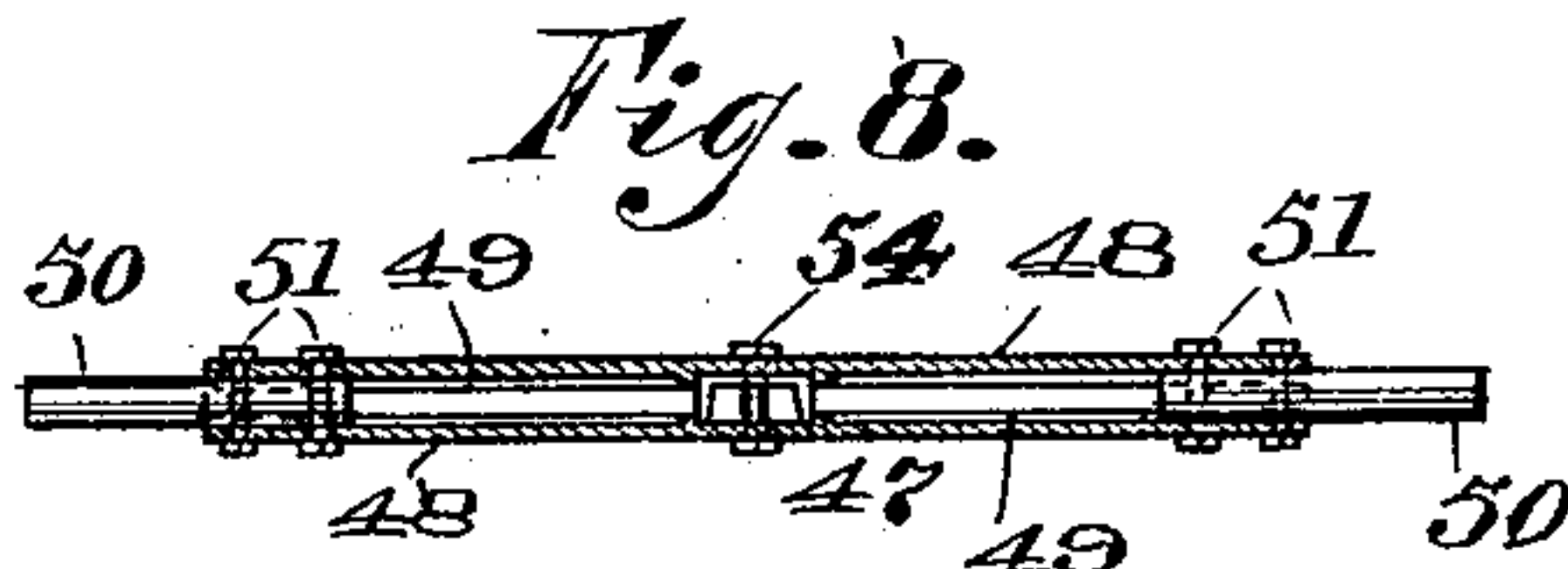
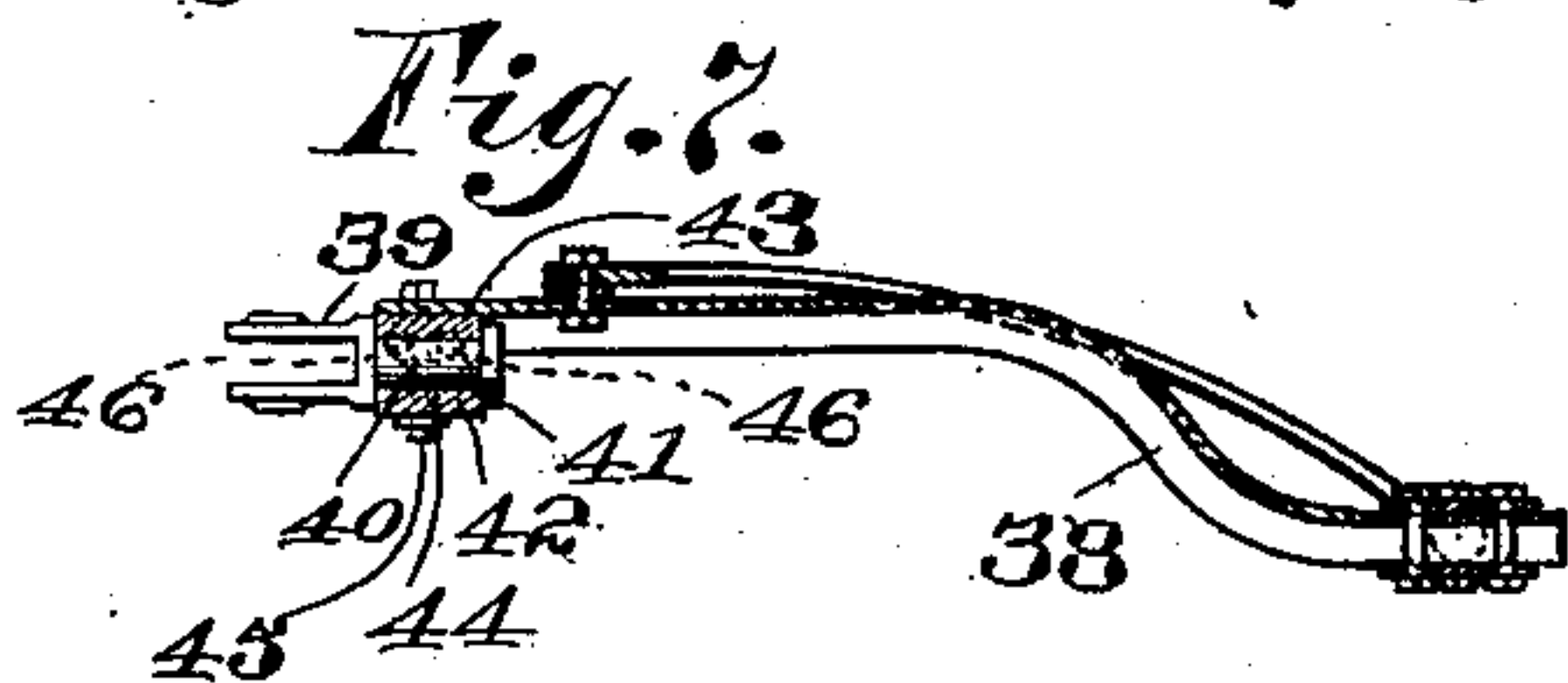
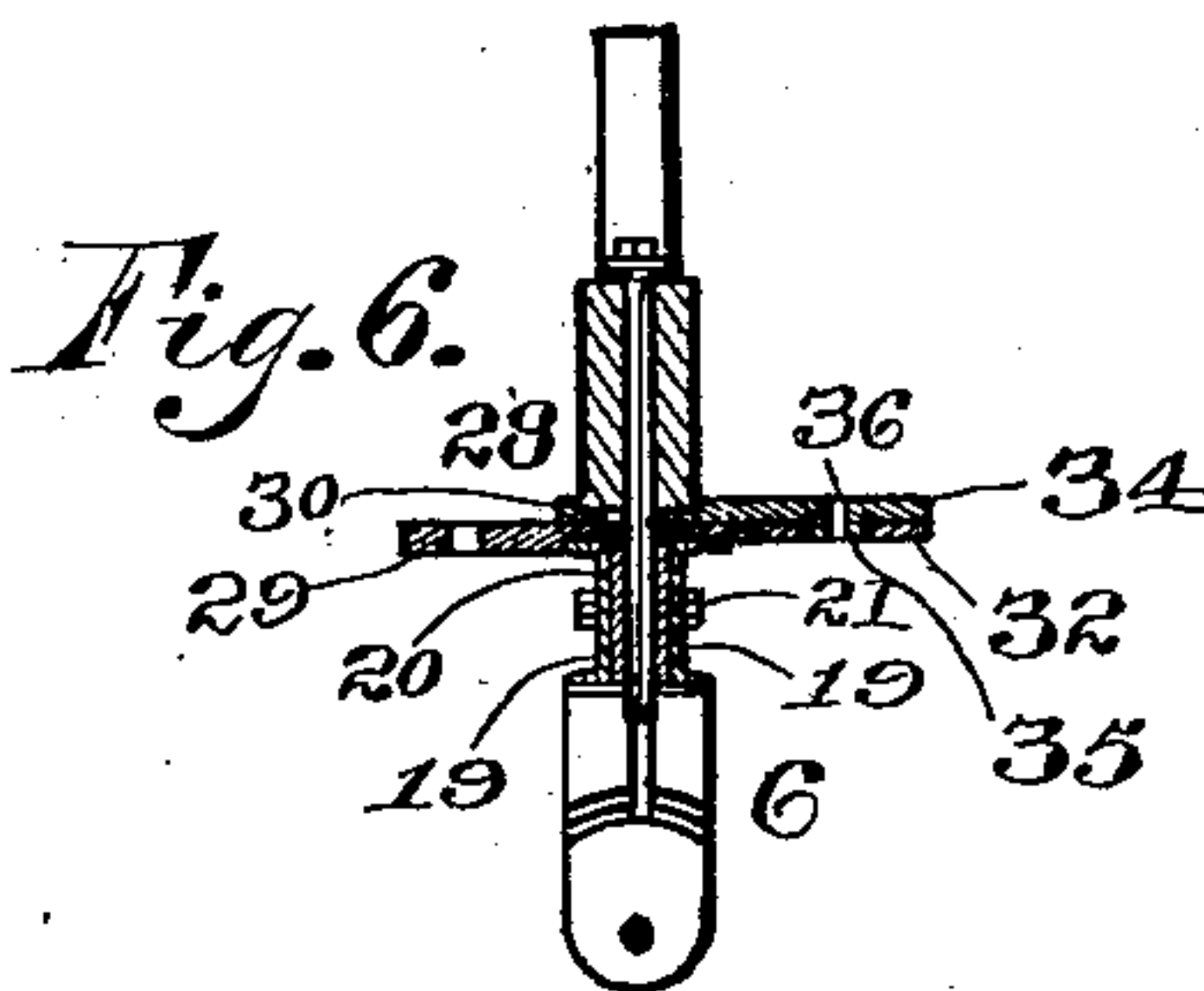
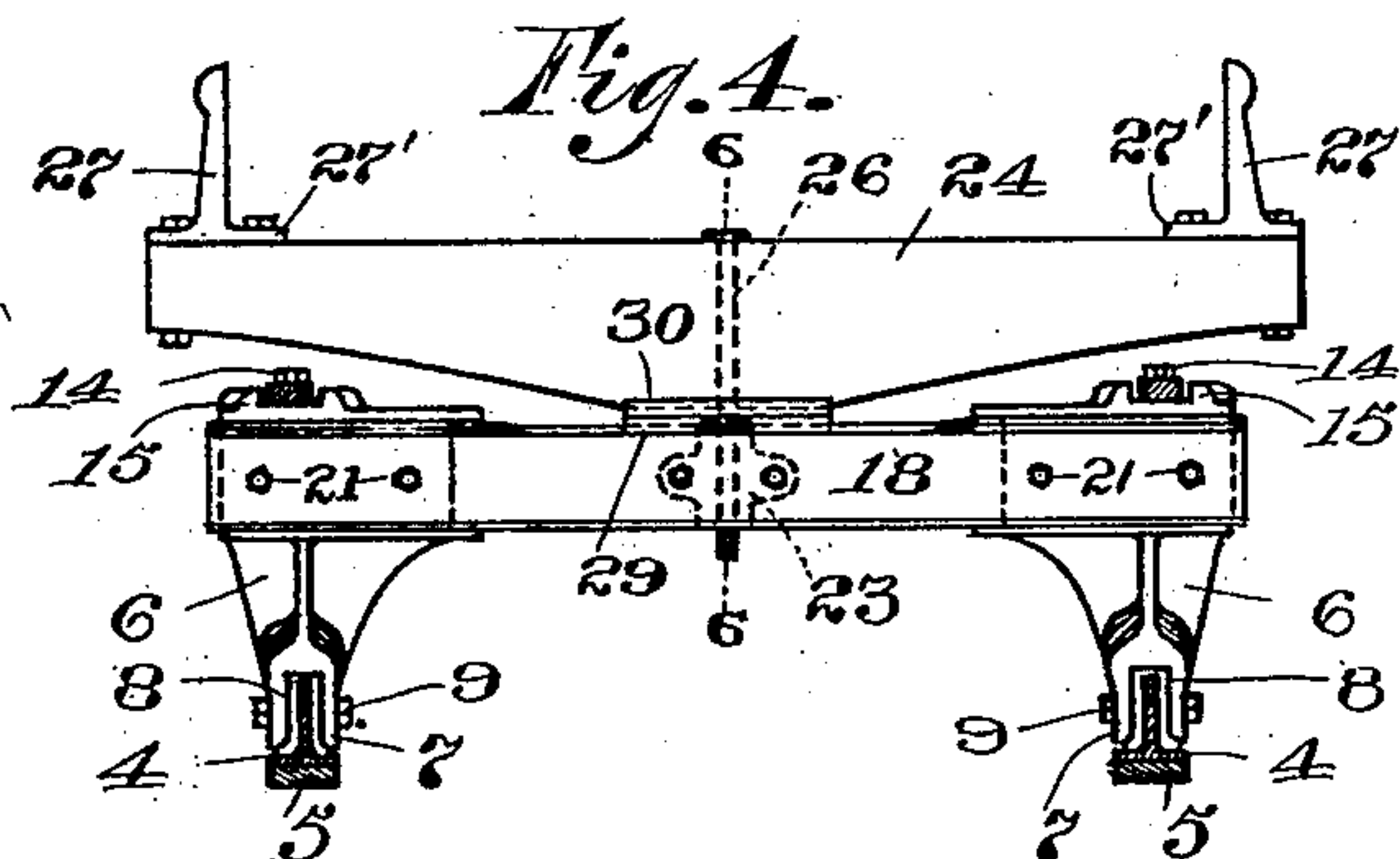
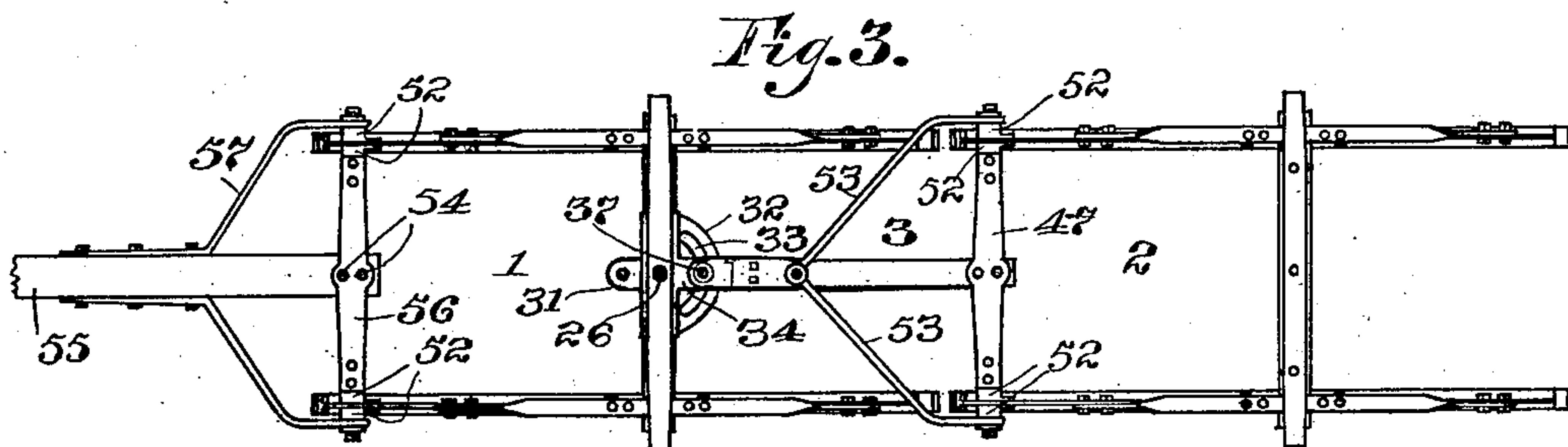
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(Application filed May 17, 1900.)

(No Model.)

2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

CONRAD MILLER, OF LEADVILLE, COLORADO.

## SLED.

SPECIFICATION forming part of Letters Patent No. 705,943, dated July 29, 1902.

Application filed May 17, 1900. Serial No. 17,050. (No model.)

*To all whom it may concern:*

Be it known that I, CONRAD MILLER, a citizen of the United States, residing at Leadville, in the county of Lake and State of Colorado, have invented certain new and useful Improvements in Sleds; 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 ap-

10 pertains to make and use the same.  
This invention relates to improvements in sleds, but more particularly relates to that class of sleds designed for the transportation of heavy freight and the like.

15 Heretofore the sleds ordinarily employed have been made of wood; but the life of these has generally proved short, and in transporting heavy freight such sleds were subject to frequent breakage. It is therefore the object  
20 of the present invention to provide a sled which is constructed entirely of steel or equivalent material, with the possible exception of the bolsters and pole, by which the life of the sled is greatly prolonged and liability to fracture reduced to a minimum; and, further-  
25 more, the invention contemplates in the construction of the sled such an arrangement of parts that the latter may be readily and quickly assembled, that when so assembled  
30 the sled will possess high qualities in point of utility and strength, and that in the use of the sled loading and unloading of the same may be executed with ease and rapidity.

35 With these and other objects in view, which will appear as the nature of the improvements is better understood, the invention consists, substantially, in the novel construction, combination, and arrangement of parts, as will be hereinafter fully described, illustrated in  
40 the accompanying drawings, and pointed out in the appended claims.

45 In the drawings, Figure 1 is a side elevation of a pair of the sled-runners; Fig. 2, a top plan view thereof; Fig. 3, a top plan view of the entire sled on a reduced scale; Fig. 4, a front elevation thereof, partly in section; Fig. 5, a rear elevation, also partly in section; Fig. 6, a transverse sectional view on the line 6-6, Fig. 4; Fig. 7, a longitudinal sectional  
50 view of the reach; Fig. 8, a similar view of the roller therefor; Fig. 9, a top plan view of said roller; Fig. 10, a top plan view, partly

broken away, of the pole and its roller; Fig. 11, a side elevation thereof, partly in section; Fig. 12, a longitudinal sectional view of said pole-roller; Figs. 13 and 14, end and side elevations, respectively, of the saddle to which the knees are connected.

Referring to the drawings, and more particularly to Fig. 3, the numeral 1 designates 60 the front pair of runners, 2 the rear pair, and 3 the reach connecting the same. These parts are formed entirely of steel or equivalent material, and by referring to Figs. 1 and 2 the construction of the runners will be more  
65 clearly seen. In these figures, 4 designates the runner proper, which is of inverted-T shape, and riveted or otherwise suitably fastened to the under face of said runner proper is a shoe 5, preferably of flat rolled steel. A  
70 knee 6 is arranged at a point substantially midway the ends of the runner 4, which knee has its lower end bifurcated, as at 7, and fitting within said bifurcated end is a saddle 8,  
75 of inverted-U shape in cross-section. The saddle 8 straddles the vertical flange of the runner 4, as is clearly seen in Figs. 4 and 5, and has its ends converging upwardly, whereby a comparatively long bearing-surface is  
80 formed at the lower edge, and said surface rests upon and extends longitudinally of the horizontal flange of the T-runner 4. The saddle 8 further reinforces the vertical flange of the runner 4, so that the latter is greatly  
85 strengthened at the point of connection of the knee 6 therewith. A pivotal bolt 9 or its equivalent passes through the sides of the knee 6, the saddle 8, and the vertical flange of the runner, by means of which the runner  
90 is capable of oscillatory movement on the knee, and arranged so as to extend over the upper end of the knee 6 is a truss-brace 10. The latter has its ends bent downwardly and twisted, and the extremities of said ends are  
95 firmly secured to the vertical flange of the runner by means of bolts 11 or their equivalent, thereby making a strong connection between the runner and the brace and effectually holding the latter. A pair of tie-rods  
100 12, however, is arranged one at each side of the knee 6, which tie-rods are also secured at their lower ends to the runner 4, as at 13, and said rods have their upper ends screw-threaded and projecting through the body portion



of the brace 10. Mounted upon the threaded end of each of said rods is a pair of binding-nuts 14, disposed, respectively, above and below said body portion of the brace 10, and thus it is obvious that when said nuts are screwed tightly upon said body portion the rods 12 provide an effective support for the latter. Each of the knees 6 is provided at its upper end with guide-lugs 15, between which the body portion of the brace 10 lies, and it is therefore apparent that said lugs while permitting the brace to follow the movements of the runner 4 during its oscillation will render the brace incapable of lateral movement.

For limiting the oscillatory movement of the runner 4 a pair of L-shaped stops 16 is employed, and one of said stops is arranged at each side of the knee 6, the stops 16 being secured to the under side of the body portion of the brace 10 by bolts 17 or their equivalent and the upper ends of the tie-rods 12. If desired, the stops 16 may be adjustably secured to said brace 10 for varying the range of oscillation of the runner.

For the purpose of connecting together the runners of each pair and also providing a firm support for the bolsters of the sled a sectional beam 18 extends transversely relative to said runners, and said beam comprises a pair of parallel members 19, formed of channel-steel or equivalent material and disposed at opposite sides of the knees 6. The latter are recessed at the upper portions of their front and rear faces, as at 20, for the reception of the members 19, and it will be noted that the upper walls of said recesses are flared, the upper flanges of the members 19 being correspondingly shaped, so as to snugly fit the recesses 20. By reason of this construction the members 19 have a stiff and durable connection with the knees 6, and for maintaining such connection bolts 21 or their equivalent are passed through the members 19 and the knees 6 and secured therein. The knees of each pair of runners are also provided at their upper ends with inwardly-extending projections 22 in order that the ends of the beams 18 may be thoroughly supported, and disposed between the members of each beam, at the center thereof, is a tubular anchoring-iron 23, bolted or otherwise suitably fastened in position. The iron 23 is designed for stiffening the beam 18 and as employed with the front pair of runners receives the king-bolt, hereinafter referred to, and provides a wearing-surface therefor. Bolsters 24 are mounted upon the supporting-beams 18, which bolsters are preferably of wood, and the bolster of the rear runners, as seen in Fig. 5, is rigidly secured in position by bolts 25 or their equivalent, the front bolster being pivoted to its supporting-beam by a king-bolt 26, the lower end of which passes through the anchoring-iron 23, as previously stated. Each of the bolsters 24 has upon its upper face a pair of standards 27, having at their lower ends inwardly-extending feet 27', and said feet are designed to lie beneath the

box of the sled when the latter is placed upon the bolsters 24.

The foregoing description relates solely to the construction of the runners; but in order that the same may be connected together the reach 3, previously referred to, extends longitudinally from the supporting-beam 18 of the front pair of runners to the forward ends of the rear runners, at which point said reach is connected to the rear runners in a manner to be presently stated. The forward end of the reach, however, is coupled to the turning-gear 28 of the sled, and by referring to Fig. 6 the construction of said gear is clearly seen, the same comprising a lower plate 29 and an upper plate 30, working thereon. The faces of each of said plates contiguous to the beam 18 and the bolster 24 are recessed for the reception of said parts, and to the latter said plates are secured in any desired manner. It will be noted, however, that the lower plate 29 is provided with a forwardly-projecting arm 31, to which may be attached a chain and spring or other suitable device for maintaining the pole of the sled normally elevated, and at its rear is also provided with a semi-circular extension 32, in which is formed a segmental guide-slot 33. The upper plate 30 is likewise provided with a rearwardly-extending arm 34, which works upon the semi-circular extension 32, and said arm 34 has at its underside a depending guide-lug 35, which lies and works within the guide-slot 33. The arm 34 is provided at the lug 35 with an aperture 36, through which a coupling-pin 37, carried by the forward end of the reach, is passed, and it will be seen that the lug 35 provides a wearing-surface for the pin 37, and thereby prevents the latter contacting with the edges of the slot 33, thus obviating the formation of irregularities therein incident to the strain upon the coupling-pin 37.

The reach 3 is formed of channel-steel or equivalent material, as seen in Figs. 7 and 8, and said reach is provided with a downwardly-extending offset 38, by means of which the rear end of the reach is positioned in a lower plane than the forward end thereof. Swiveled to the forward end of the reach 3 is a coupling-head 39, the forward end of which is forked and connected by means of the pin 37 to the arm 34 of the upper plate 30 of the turning-gear, thereby embracing the rearwardly-extending portions of the latter, but permitting the lower plate 29 and its parts to follow the movements of the front pair of runners in turning, and formed integral with said forked end is a rearwardly-projecting shank 40, having at its free end an enlarged head 41. The shank 40 is of less diameter than the forked end of the head 39 and is circular in cross-section, and embracing said shank is a sectional clamping-collar 42. The latter comprises an upper member 43 and a lower member 44, fitted, respectively, to the upper and lower sides of the shank, and said upper member lies within the forward end of the reach.



Bolts 45 or their equivalent are employed for detachably connecting together the members of the collar 42 and at the same time maintaining them in clamped relation to the shank 40 and the reach 3; but for further securing the upper member 43 in the reach horizontally-disposed pins 46 are inserted at the sides of the latter into said member. By the construction described it will be seen that each pair of the runners is capable of movement independent of the other, as when passing over inequalities in the road-bed, and it will thus be obvious that no twisting strain whatever is exerted upon the connection between the reach and the front pair of runners during such movement.

The numeral 47 designates the reach-roller, which is designed for yieldingly connecting the reach to the rear pair of runners, and said roller comprises a pair of plates 48, preferably of cast-steel, arranged in superimposed relation, but spaced from each other in order to receive the rear end of the reach 3. The inner face of each of said plates is provided at its edges and center with ribs 49, and fitted between said ribs at each end of the plates is an attaching-spindle 50. The spindles 50 are removably secured between the plates 48 by means of bolts 51 or their equivalent, whereby when said spindles have become worn the same may be easily and quickly replaced at small expense and without the necessity of employing an entirely new roller, and said spindles pass through the forward ends of the runners proper, 4, of the rear pair. At the sides of the vertical flanges of said runners proper and at the points through which the spindles 50 pass are arranged bearing-eyes 52, which eyes are adapted to reinforce said vertical flanges and also provide wearing-surfaces for the spindles 50, and it will be observed that the latter pass through and lie within said eyes and are secured therein by any suitable means. Rearwardly-diverging braces 53 are suitably connected to the reach for stiffening and strengthening the same, and the rear ends of said braces are connected to the spindles 50 exterior of the runners proper, whereby said spindles are highly strengthened. As before stated, the rear end of the reach 3 is received between the plates 48 of the roller 47, and said reach lies between the central ribs 49 and is secured therebetween by bolts 54 or their equivalent.

A pole 55 is arranged at the forward end of the front pair of runners, said pole being preferably of wood, and the same is attached to said runners by means of a roller 56. The construction of the latter is precisely the same as the roller 47 and secured in also the same manner as said roller 47, and for strengthening the pole rearwardly-diverging braces 57 are employed, which braces are attached to the pole-roller similar to the braces 53. The forward ends of said braces, however, extend along the sides of the pole 55 and are secured thereto.

From the foregoing it will be seen that the herein-described invention provides a sled which embodies high qualities in point of durability and strength, and especial stress is laid upon the construction of the runners, whereby a perfect distribution of resistance to the load is obtained. This is due to the fact that the load is carried on the runners by contact with the saddles 8, through the knees 6 and beams 18, and as the saddles 8 extend between the tie-rods 12, which have their upper ends fastened in the truss-braces 10, the load will hang upon said truss-braces and cannot sag the runners proper without stretching the same or buckling the truss-braces. Moreover, the nuts 14 provide means to take up wear and maintain the runners straight under any load.

While a preferable embodiment of the invention is disclosed, it will of course be understood that the invention is not limited thereto, but the right is reserved to modify or vary the same as falls within the spirit and scope thereof.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a forked coupling-head carried by said reach and provided with a shank, means for detachably connecting said shank with the reach, and means for connecting the head with the other runners.

2. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a forked coupling-head carried by said reach and provided with a shank, a clamping-collar for detachably connecting said shank with the reach, and means for connecting the head with the other runners.

3. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a forked coupling-head carried by said reach and provided with a shank, a clamping-collar for detachably connecting said shank with the reach, and a pin for connecting the head with the other runners.

4. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a turning-gear carried by the other pair, and a forked coupling-head connected to said reach, the fork of said head receiving and embracing said turning-gear.

5. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, said reach being provided with a downwardly-extending offset, and a coupling-head connected to said reach and also connected to the other pair of runners.

6. In a sled, runners arranged in pairs, a reach arranged between the same and con-



connected to one pair of said runners, said reach being provided with a downwardly-extending offset, a turning-gear carried by the other pair of runners, and a forked coupling-head  
5 connected to said reach, the fork of said head receiving and embracing said turning-gear.

7. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a turning-  
10 gear carried by the other pair and comprising a pair of plates working upon each other, one of said plates being provided with an extension having a segmental guide-slot, and the other plate carrying a guide-lug working in  
15 said slot, and a connection between said reach and said turning-gear.

8. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a turning-  
20 gear carried by the other pair and comprising a pair of plates working upon each other, one of said plates being provided with an extension having a segmental guide-slot, and the other plate carrying a guide-lug working in  
25 said slot, and a swivel connection between said reach and said turning-gear.

9. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a turning-  
30 gear carried by the other pair and comprising a pair of plates working upon each other, one of said plates being provided with an extension having a segmental guide-slot, and the other plate carrying a guide-lug working in  
35 said slot, and a coupling-head swiveled to said reach and connected to said turning-gear.

10. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a turning-  
40 gear carried by the other pair and comprising a pair of plates working upon each other, one of said plates being provided with an extension having a segmental guide-slot, and the other plate carrying a guide-lug working in  
45 said slot, and a forked coupling-head swiveled to said reach and embracing the plates of said turning-gear.

11. In a sled, runners arranged in pairs, a reach arranged between the same and connected to one pair of said runners, a turning-  
50 gear carried by the other pair and comprising a pair of plates working upon each other, one of said plates being provided with an extension having a segmental guide-slot, and the other plate carrying a guide-lug working in  
55 said slot and provided with an aperture, a forked coupling-head swiveled to said reach and embracing the plates of said turning-gear, and a pin passing through said forked head  
60 and the aperture of the guide-lug.

12. In a sled, runners arranged in pairs, a reach arranged between the same, a roller carried by said reach and comprising a pair of superimposed plates, attaching-spindles removably secured to said plates and connected to one pair of said runners, and a connection between the reach and the other pair.

13. In a sled, runners arranged in pairs, a reach arranged between the same, a roller carried by said reach and comprising a pair of  
70 superimposed plates, attaching-spindles removably secured to said plates and connected to one pair of said runners, and a swivel connection between the reach and the other pair.

14. In a sled, runners arranged in pairs, a reach arranged between the same, a roller carried by said reach and comprising a pair of  
75 superimposed plates, attaching-spindles removably secured to said plates and connected to one pair of said runners, bearing-eyes carried  
80 by said runners and adapted to receive the attaching-spindles, and a connection between the reach and the other pair.

15. In a sled, runners arranged in pairs, a reach arranged between the same, a roller carried by said reach and comprising a pair of  
85 superimposed plates, attaching-spindles removably secured to said plates and connected to one pair of said runners, bearing-eyes carried by said runners and adapted to receive  
90 the attaching-spindles, braces carried by the reach and connected to said spindles, and a connection between the reach and the other pair of runners.

16. In a sled, runners arranged in pairs, a reach arranged between the same, a roller carried by said reach and connected to one pair of said runners, a pole carried by the other pair, and a roller carried by said pole for connecting it to said runners, said reach and pole  
100 rollers each comprising a pair of spaced plates, and attaching-spindles arranged therebetween for connection with the respective runners.

17. In a sled, runners arranged in pairs and each comprising a runner proper, a knee pivoted thereto, and a sectional supporting-beam connecting the knees of each runner, each of said beams being provided with an anchoring-iron arranged between its sections, and  
110 a reach arranged between the pairs of runners.

18. In a sled, runners arranged in pairs and each comprising a runner proper, a knee pivoted thereto, and a sectional supporting-beam connecting the knees of each pair, and a reach arranged between said pairs.  
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19. In a sled, runners arranged in pairs and each comprising a runner proper, a knee pivoted thereto, a brace secured to the runner proper and extending over said knee, and a sectional supporting-beam connecting the knees of each pair, and a reach arranged between said pairs.  
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20. In a sled, runners arranged in pairs and each comprising a runner proper, a knee pivoted thereto, a brace secured to the runner proper and extending over said knee, tie-rods connected to the runner proper and having an adjustable connection with the brace for supporting the latter, and a supporting-beam connecting the knees of each pair of runners, and a reach arranged between said pairs.  
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21. In a sled, runners arranged in pairs and  
130



each comprising a runner proper, a knee pivoted thereto, a brace secured to the runner proper and extending over said knee, tie-rods connected to the runner proper and the brace for supporting the latter, stops carried by said brace for limiting the movement of the runner on the knee, and a supporting-beam connecting the knees of each pair of runners, and a reach arranged between said pairs.

22. In a sled, runners arranged in pairs and each comprising a runner proper, a knee pivoted thereto, a brace secured to the runner proper and extending over said knee, tie-rods connected to the runner proper and the brace for supporting the latter, stops for limiting the movement of the runner on the knee, and a supporting-beam connecting the knees of each pair of runners, a reach arranged between the runners and connected to one of the pairs thereof, and a swivel connection between the reach and the other pair.

23. In a sled, runners arranged in pairs and each comprising a runner proper, a knee pivoted thereto and provided at its front and rear faces with recesses, and a sectional supporting-beam for connecting the runners of each pair, the members of said beam fitting within said recesses, and a reach arranged between the pairs of runners.

24. In a sled, runners arranged in pairs and each comprising a runner proper, a knee pivoted thereto and provided at its front and rear faces with recesses, means for limiting the movement of said runner proper on said knee, and a sectional supporting-beam for connecting the runners of each pair, the members of said beam fitting within the recesses of the knee, and a reach arranged between the pairs of runners.

25. In a sled, a runner comprising a runner proper, a U-shaped saddle embracing the runner proper, and a knee connected to said saddle.

26. In a sled, a runner comprising a runner proper, a U-shaped saddle embracing the runner proper, and a knee having its lower end bifurcated and receiving said saddle for connecting the knee to the runner proper.

27. In a sled, a runner comprising a runner proper, a saddle connected to said runner proper, the ends of said saddle converging to provide a comparatively long bearing-surface at the point of contact between the saddle and the runner proper, and a knee connected to said saddle.

28. In a sled, a runner comprising a runner proper of inverted-T shape in cross-section, a U-shaped saddle embracing the runner proper, and a knee having its lower end bi-

furcated and receiving said saddle for connecting the knee to the runner proper.

29. In a sled, a runner comprising a runner proper, a knee pivoted thereto, a brace secured to the runner proper and extending over the knee, and L-shaped stops carried by said brace for limiting the movement of the runner upon said knee.

30. In a sled, a runner comprising a runner proper, a knee pivoted thereto, a brace secured to the runner proper and extending over the knee, tie-rods also secured to the runner and the brace for supporting the latter, and stops carried by said brace for limiting the movement of the runner upon said knee.

31. In a sled, a runner comprising a runner proper, a saddle embracing said runner proper, a knee having its lower end bifurcated and receiving said saddle to connect the knee to the runner proper, a brace secured to the runner proper and extending over the knee, and tie-rods also secured to the runner proper and the brace for supporting the latter.

32. In a sled, a runner comprising a runner proper, a saddle embracing said runner proper, a knee having its lower end bifurcated and receiving said saddle to connect the knee to the runner proper, a brace secured to the runner proper and extending over the knee, tie-rods also secured to the runner proper and the brace for supporting the latter, and stops carried by said brace for limiting the movement of the runner proper upon the knee.

33. In a sled, a runner comprising a runner proper of inverted-T shape in cross-section, a U-shaped saddle embracing said runner proper, a knee having its lower end bifurcated and receiving said saddle to connect the knee to the runner proper, a brace secured to the runner proper and extending over the knee, and tie-rods also secured to the runner proper and the brace for supporting the latter.

34. In a sled, a runner comprising a runner proper of inverted-T shape in cross-section, a U-shaped saddle embracing said runner proper, a knee having its lower end bifurcated and receiving said saddle to connect the knee to the runner proper, a brace secured to the runner proper and extending over the knee, tie-rods also secured to the runner proper and the brace for supporting the latter, and stops carried by the brace for limiting the movement of the runner proper upon the knee.

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

CONRAD MILLER.

Witnesses:

KNUD RASMUSSEN,  
MARY COCHRAN.