

No. 748,067.

PATENTED DEC. 29, 1903.

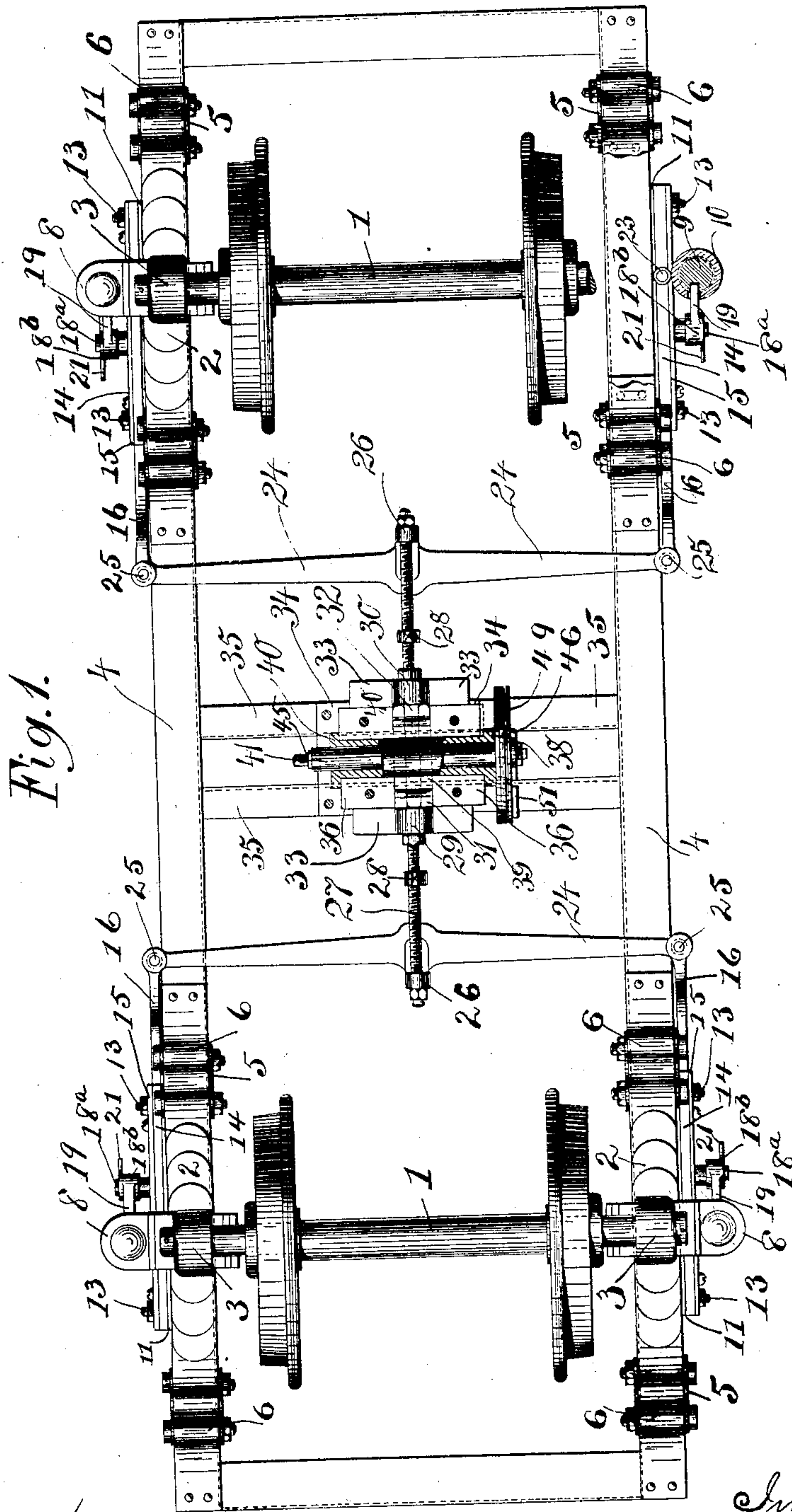
L. M. F. HACKER.

MEANS FOR ASCERTAINING THE LOAD ON WAGONS.

APPLICATION FILED JUNE 12, 1902.

5 SHEETS—SHEET 1.

NO MODEL.



Witnesses:
James R. Mansfield
Geo. J. Weber

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By:
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5 SHEETS—SHEET 2.

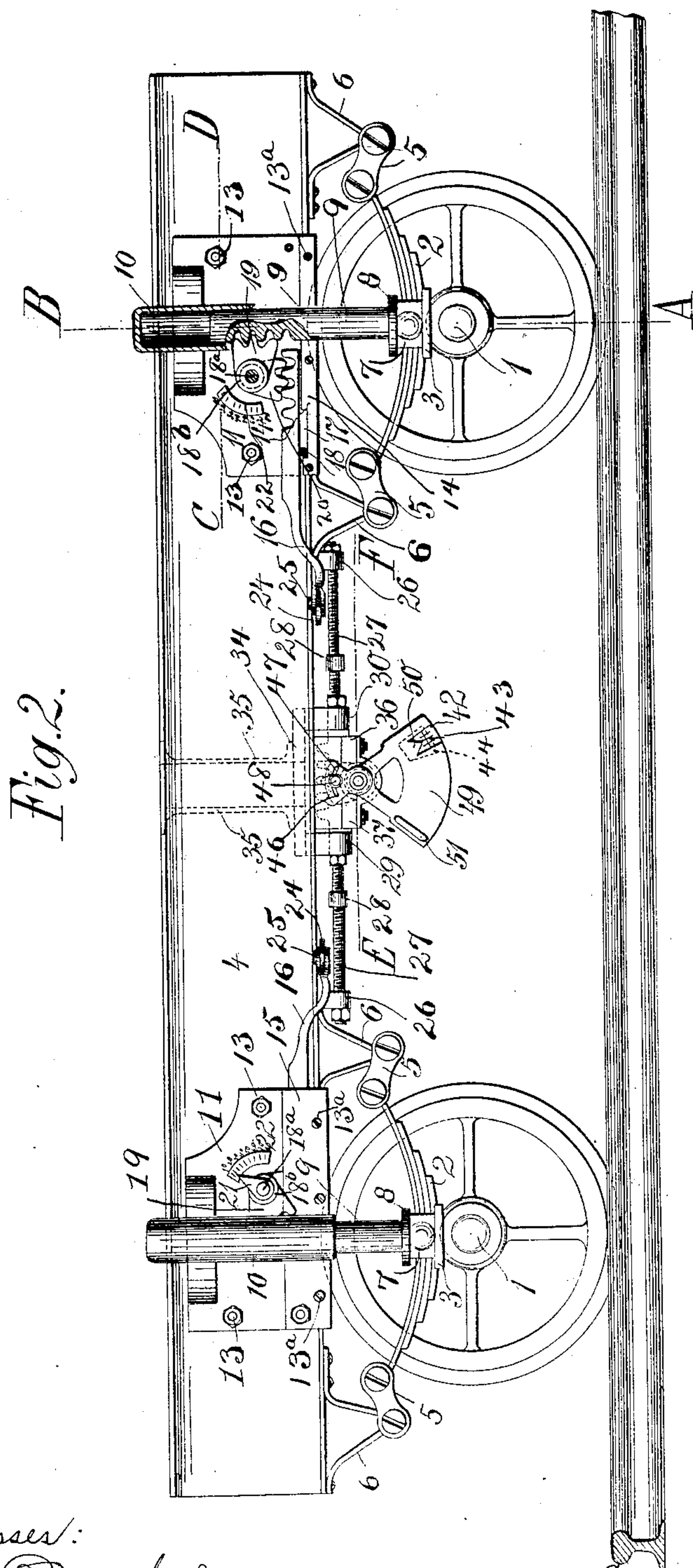


Fig. 2.

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5 SHEETS—SHEET 3.

Fig. 3.

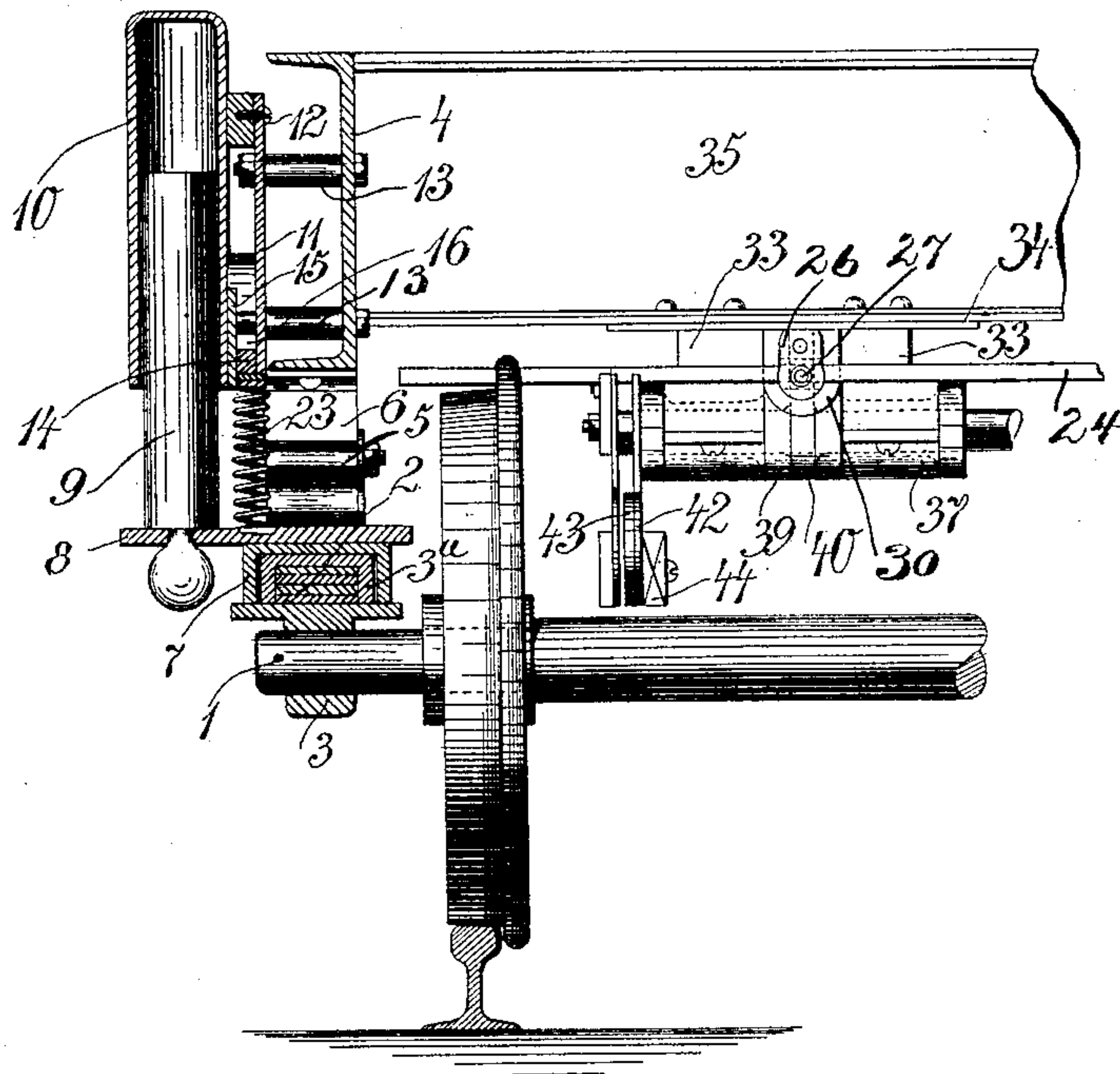


Fig. 4. ₄₈

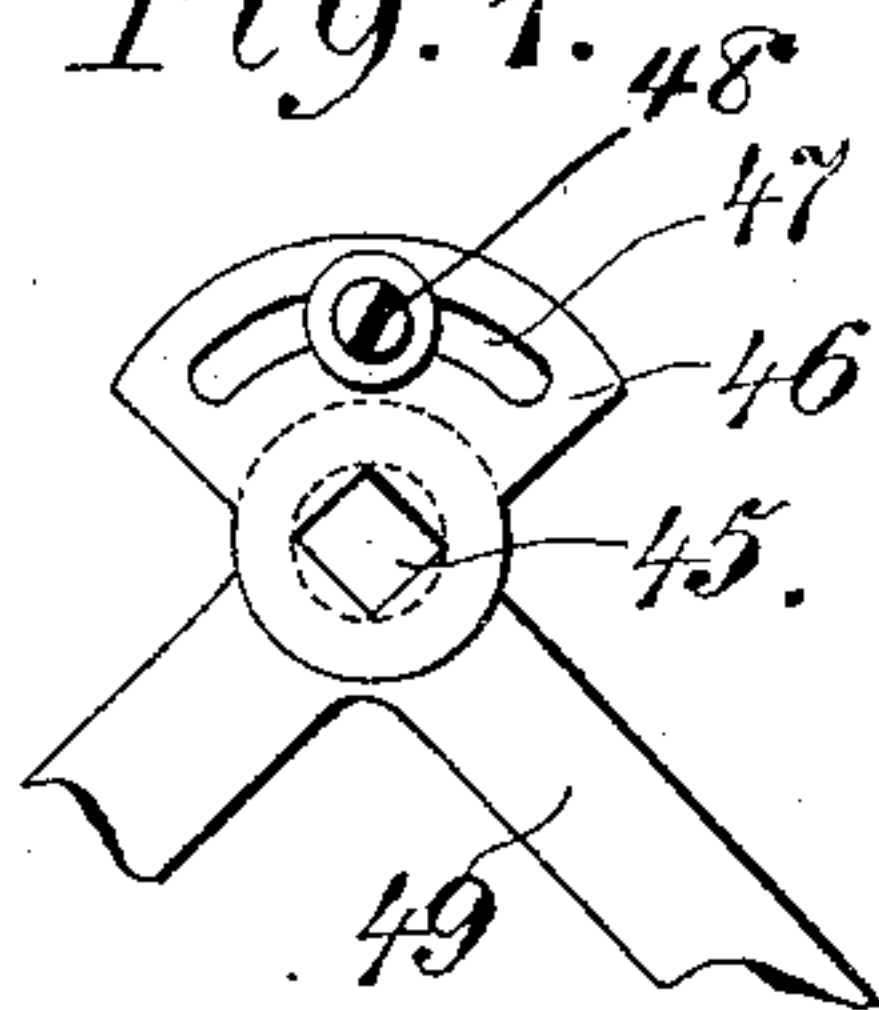
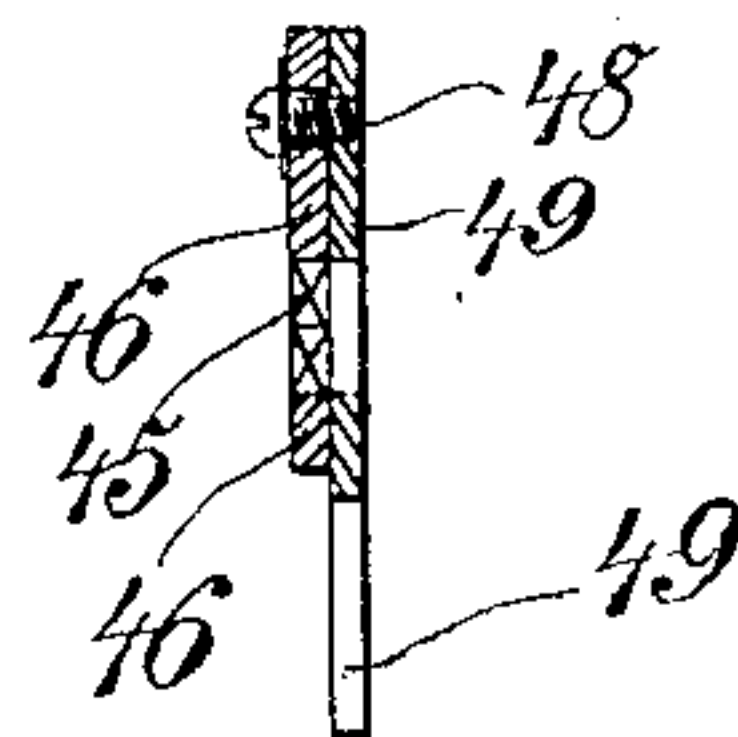


Fig.5.



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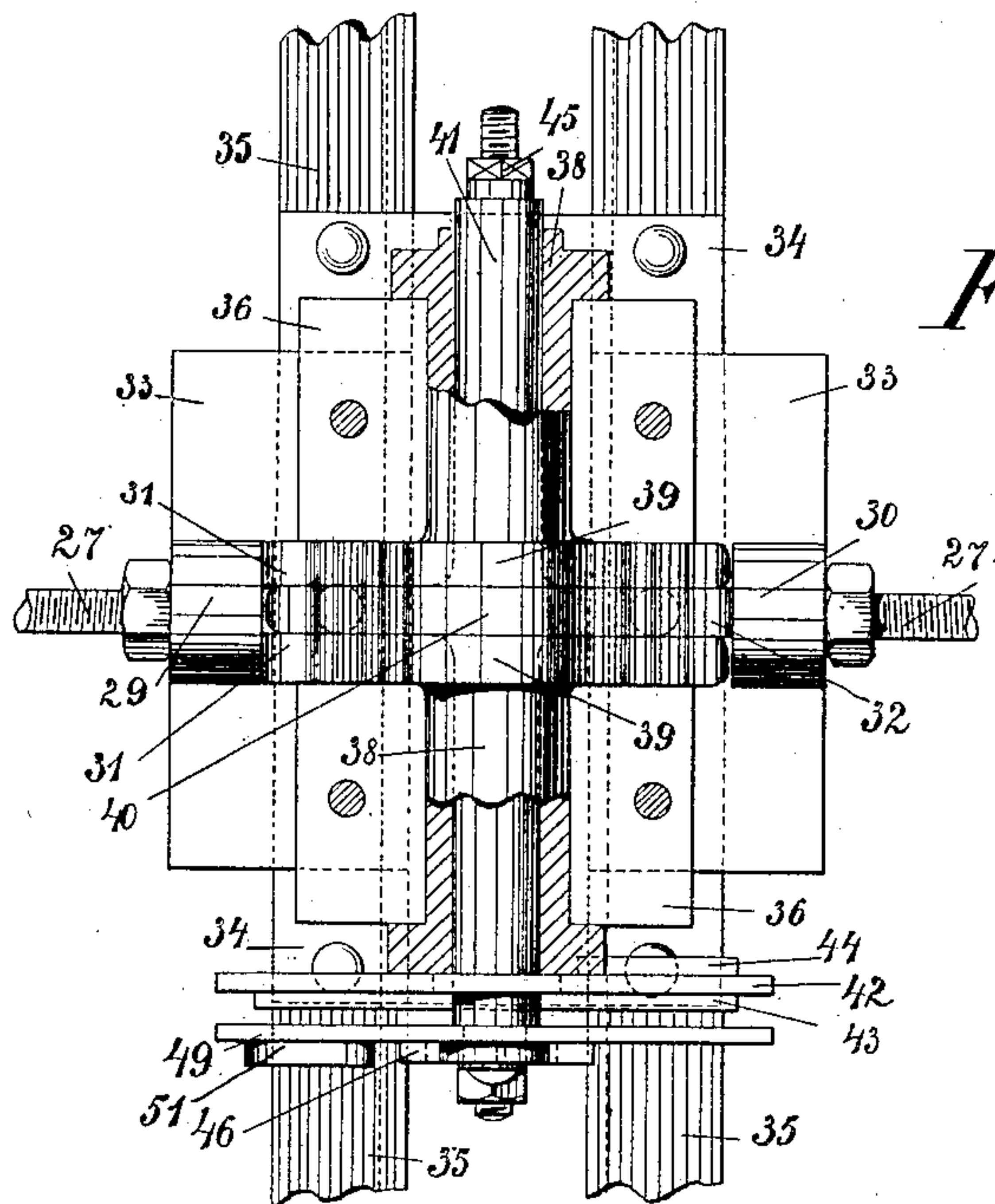
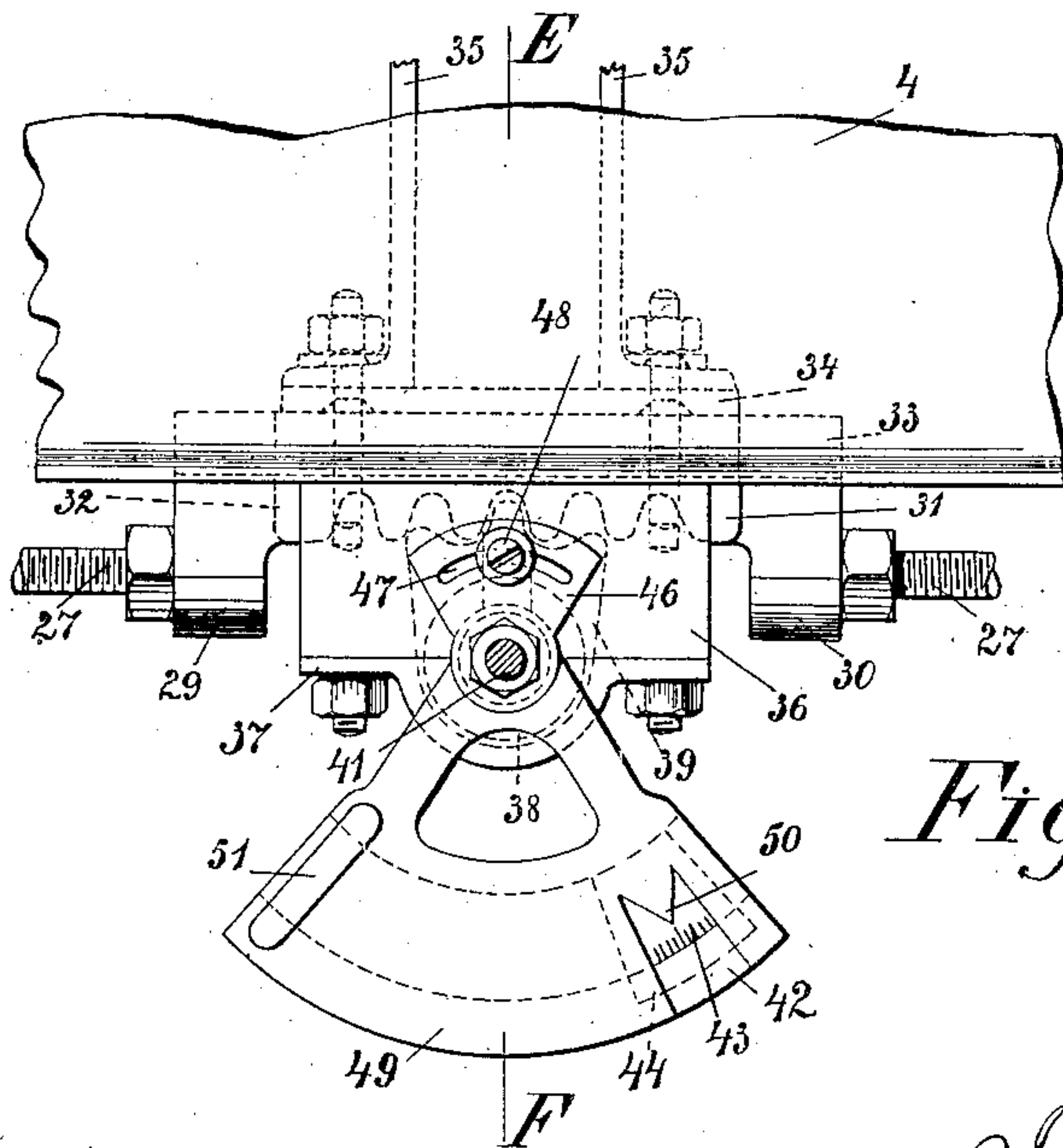
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5 SHEETS—SHEET 4.

*Fig. 6.**Fig. 7.*

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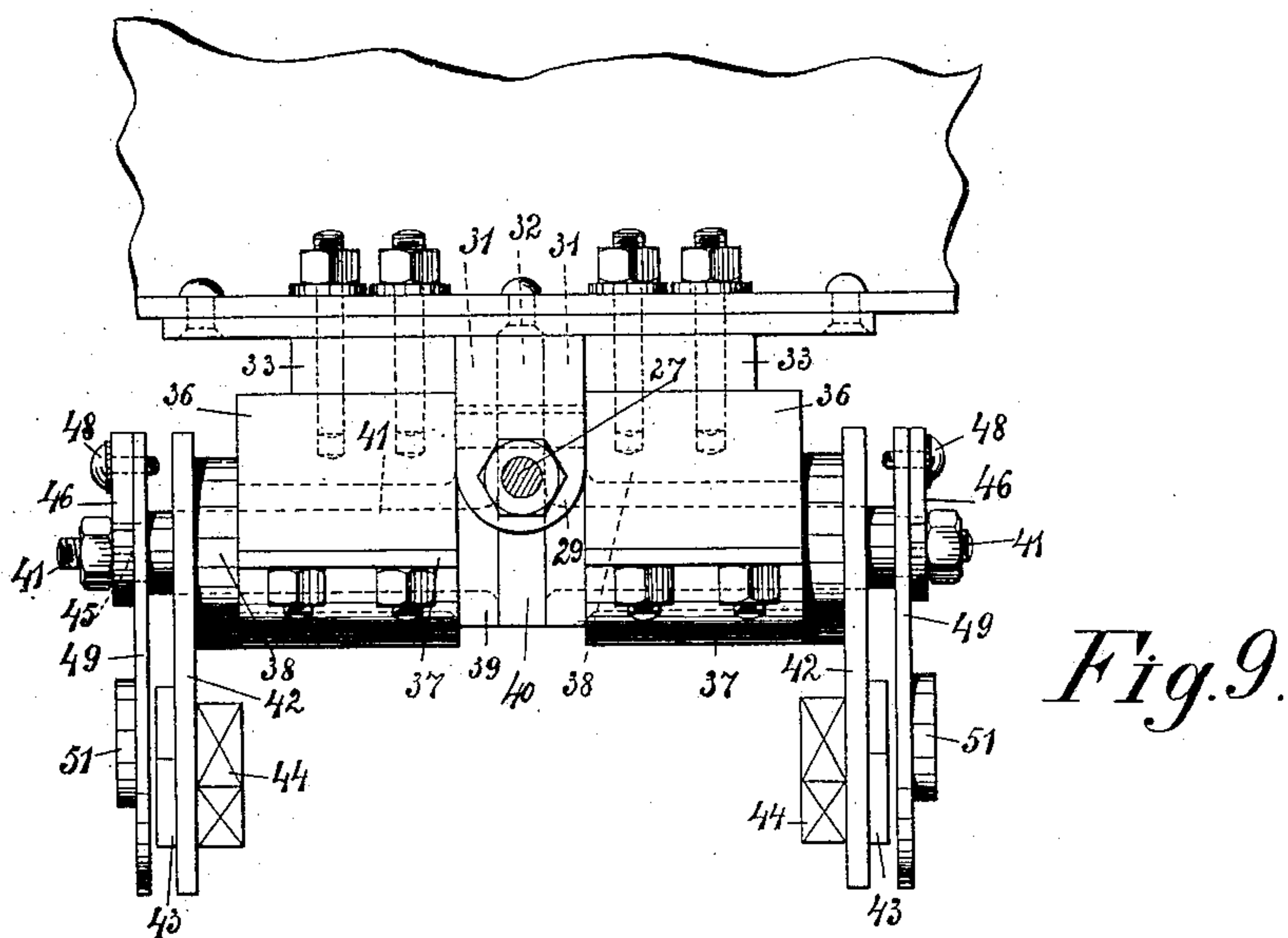
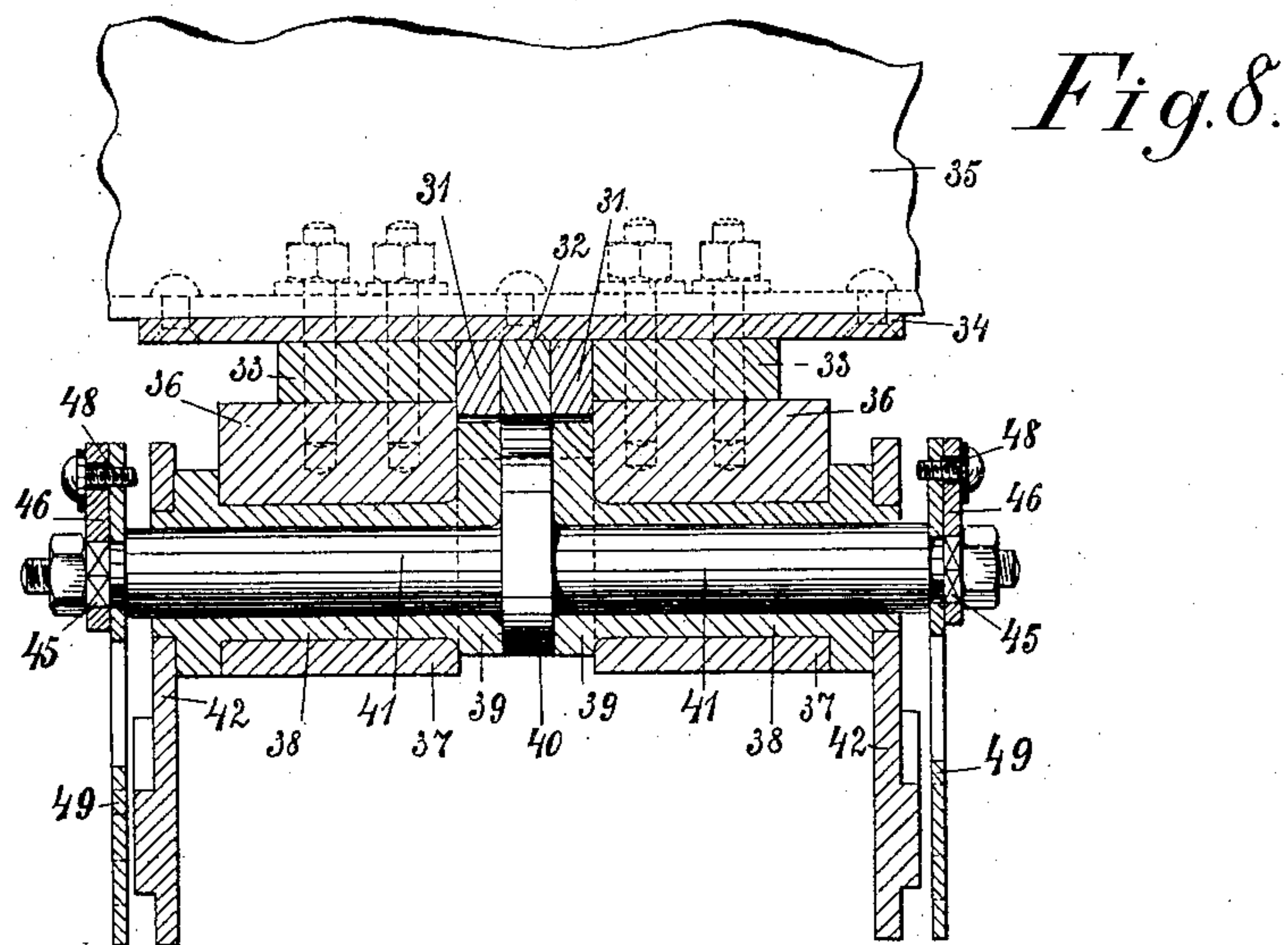
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5 SHEETS—SHEET 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

LUDWIG MARTIN FRIEDRICH HACKER, OF MALCHIN, GERMANY.

MEANS FOR ASCERTAINING THE LOAD ON WAGONS.

SPECIFICATION forming part of Letters Patent No. 748,067, dated December 29, 1903.

Application filed June 12, 1902. Serial No. 111,399. (No model.)

To all whom it may concern:

Be it known that I, LUDWIG MARTIN FRIEDRICH HACKER, a subject of the German Emperor, residing at Malchin, Mecklenburg, Germany, have invented certain new and useful Improvements in Means for Ascertaining the Load on Wagons, of which the following is a specification.

My invention relates to a device designed to enable the load on a wagon to be ascertained by reading a scale and is adapted for such wagons as are supported on springs. By means of this device it can be conveniently ascertained, for example, whether the load on a wagon at the end of the journey is the same as at the beginning.

In the accompanying drawings, illustrating my invention, Figure 1 is a plan from below of a railway-wagon, showing the device attached thereto. Fig. 2 is a side elevation of the base of the wagon, showing the device in partial section. Fig. 3 is a section on the line A B of Fig. 2 on an enlarged scale. Figs. 4 and 5 show details. Fig. 6 is an enlarged bottom plan view of the total-indicating mechanism. Fig. 7 is a side view of Fig. 6. Fig. 8 is a central longitudinal section through Fig. 6. Fig. 9 is an end view of Fig. 6.

The ends of the axles 1 outside of the wheels are connected to the springs 2 by means of the plates 3. By means of the links 5 the springs 2 are connected to the U-shaped side pieces of the frame 4 through hangers 6. On each of the plates 3 rests an inverted-U-shaped plate 7, to which is secured an outwardly-projecting plate 8. A piston 9 is secured to this plate 8, the upper end of said piston being formed as a toothed rack guided by a sleeve 10, secured to a plate 11 by means of screws 12. The plate 11 is fastened by studs 13 to the U-shaped side beams 4 of the wagon-frame. To the plate 11 is secured, by means of screws 13^a, a rail 14 and plate 15, which are so arranged as to form a guide for the rack 16. In the rail 14 is provided a groove 17, in which rests a ball or roller designed to reduce the friction of the rack 16. On the bolt 18^a, which projects from the plate 11, turn two toothed segments 19 20, connected together by a sleeve 18^b. The segment 19 meshes with the rack part of the piston 9, while the segment 20 meshes with the

rack 16. To the sleeve connecting the two segments 19 20 is secured a hand 21, which moves over a scale 22. Between the rail 14 and the plate 8 is provided a spring 23, which presses the plunger 9 and plate 8 downward, keeping plate 7 close against the plate 3. The racks 16 are extended downward and are connected together in pairs by means of cross-rods 24, situated underneath the U-shaped side beams. For this purpose the racks 16 are each provided with a fork at the lower end into which fits an eye of the cross-rod 24, a screw-bolt 25 completing the connection. On each of the cross-rods 24 is provided a boss 26, through which is screwed a screw-rod 27, on the middle of which is provided a hexagonal collar 28. The screw-thread on opposite sides of the collar 28 is respectively right and left handed. These spindles 27 are screwed into bosses 29 30, respectively, of which 29 is connected to a forked rack 31, while 30 is provided on a rack 32, adapted to fit between the members of the fork 31. These racks are mounted in guides 33, secured to a plate 34, which is screwed to two U-iron cross-bars 35, connected at their ends with the side beams 4 of the wagon-frame. To the guides 33 are secured the plumber-blocks 36, provided with the caps 37. In these blocks 36 turn hollow shafts 38, to the inner end of each of which is secured a toothed segment 39. The outer ends of these shafts are provided with flanges, which bear against the sides of the journal-boxes. Through these hollow shafts 38 projects a shaft 41, on which is fixed a segment 40 between the segments 39. The segment 40 meshes with the rack 32, while the segments 39 mesh with the members of fork 31. Both ends of the shaft 41 project beyond the flanges at the outer ends of the shafts 38. Near each end of the shaft 41 is provided a square and adjacent thereto a screw portion. Each flange of the hollow shafts 38 carries a segment 42, having front plates 43, provided with a scale of weights. At the back of the segments 42 are secured weights 44. On each square of the shaft 41 are fixed the segments 46, which project upward, each being provided with a curved slot 47, in which a screw-bolt 48 can slide. A downwardly-projecting segment 49 is provided on the shaft 41. This segment possesses an indicator 50 and can

be secured in any angular position relative to the shaft 41 by means of a screw 48. In this way the position of the hand 50 may be adjusted with regard to the segments 46. A weight 51 on segment 49 serves to maintain equilibrium in the normal position.

The operation of the device is as follows: When the wagon is loaded, the framework 4 is depressed and the springs 2 flattened. The pistons 9 are moved into the guide-sleeves 10 and turn the segments 19 20 a corresponding extent. In this way the racks 16 and the cross-rods 24 are moved away from the middle of the wagon and the corresponding racks and segments are operated, by which, on the one hand, the hollow shaft 38 and the scale-segment 42 and, on the other hand, the shaft 41 and the indication-scale 49 50 are actuated. The relative movements of these parts will be greater or less, according to the amount of the load. By trials during the fitting up of the device the accuracy of the record must of course be tested.

For the purpose of ascertaining whether the load is uniformly distributed the indicator-hands 21 and scale 22 are utilized. When one or the other side of the wagon is more loaded than the other, the hands 21 will record a greater or less amount, without, however, showing the total load on the wagon.

In order to obtain exact results, the four springs of the wagon must possess the same tension. The position of the segments may be adjusted by screwing the spindles 27 more or less into the bosses 26 29 and 26 30, respectively.

By means of this device the load on a wagon may be read off at once, so that it can easily be ascertained whether the same load is on the wagon at the end of the journey as at the commencement.

The construction of the various parts may of course be altered or modified according to requirements without departing from the spirit of the invention.

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

1. The combination with the axles and wheels of a vehicle, supporting-springs adjacent to each wheel, means to indicate the load on the springs at each end of each axle, and means to indicate the total sum of the loads on all the springs, substantially as set forth.

2. The combination with the supporting-springs of a wagon, of racks respectively adjacent to said springs, a toothed segment meshing with each rack, a second rack adapted to be moved by said toothed segment, cross-bars connecting in pairs said second racks on opposite sides of the wagon, a third rack secured to said cross-bar, and a second toothed segment meshing with said third rack and a load-indicating device, operated by said sec-

ond toothed segment, substantially as set forth.

3. The combination with the several supporting-springs of a wagon, of a rack adjacent to each spring, a toothed segment meshing with each rack, an indicator-hand connected with said segment to show the weight on its related spring, and means immediately connected to and actuated by the several segments for indicating the total weight on all the springs, substantially as set forth.

4. The combination with the supporting-springs of a wagon, of racks adjacent to said springs, a toothed segment meshing with each said rack, a second rack adapted to be moved by said toothed segment, two cross-bars connecting in pairs said second racks on opposite sides of the wagon, a forked rack secured to one of said cross-bars and a rack secured to the other said cross-bar and adapted to slide in said forked rack, and segments meshing with these said racks, substantially as set forth.

5. The combination with the supporting-springs of a wagon, of racks adjacent to said springs, a toothed segment meshing with said rack, a second rack adapted to be moved by said segment, two cross-bars connecting in pairs said second racks on opposite sides of the wagon, a forked rack secured to one of said cross-bars, a rack secured to the other said cross-bar and adapted to slide in said forked rack, a segment meshing with the last said rack and fixed on a shaft, two segments each adapted to mesh with a member of said forked rack and each fixed on a hollow shaft, turning on said shaft, and a scaled segment secured on each said hollow shaft, substantially as set forth.

6. The combination with the supporting-springs of a wagon, of racks adjacent to said springs, a toothed segment meshing with said rack, a second rack adapted to be moved by said segment, two cross-bars connecting in pairs said second racks on opposite sides of the wagon, a forked rack secured to one of said cross-bars, a rack secured to the other said cross-bar and adapted to slide in said forked rack, a segment meshing with the last said rack and fixed on a shaft, two segments each adapted to mesh with a member of said forked rack and each fixed on a hollow shaft turning on said shaft, a scaled segment secured on each said hollow shaft, a second segment fixed on said solid shaft and a third segment adapted to be adjusted on said shaft relative to said second segment, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

LUDWIG MARTIN FRIEDRICH HACKER.

Witnesses:

J. A. HOYERMANN,
F. A. BRYCE.