

F. N. ROOT.
ROAD MACHINE.

APPLICATION FILED SEPT. 4, 1908.

934,630.

Patented Sept. 21, 1909.

3 SHEETS—SHEET 1.

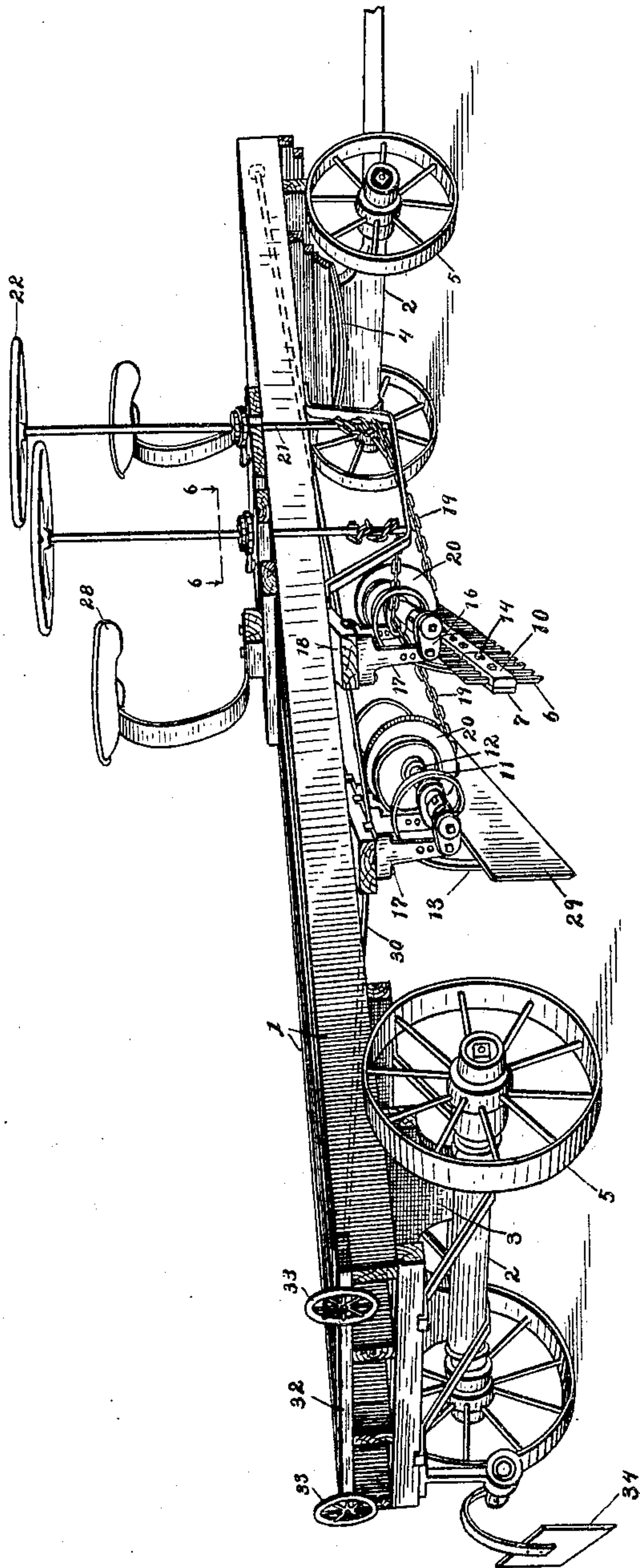


Fig. 1.

Inventor

Witnesses
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3 SHEETS—SHEET 2.

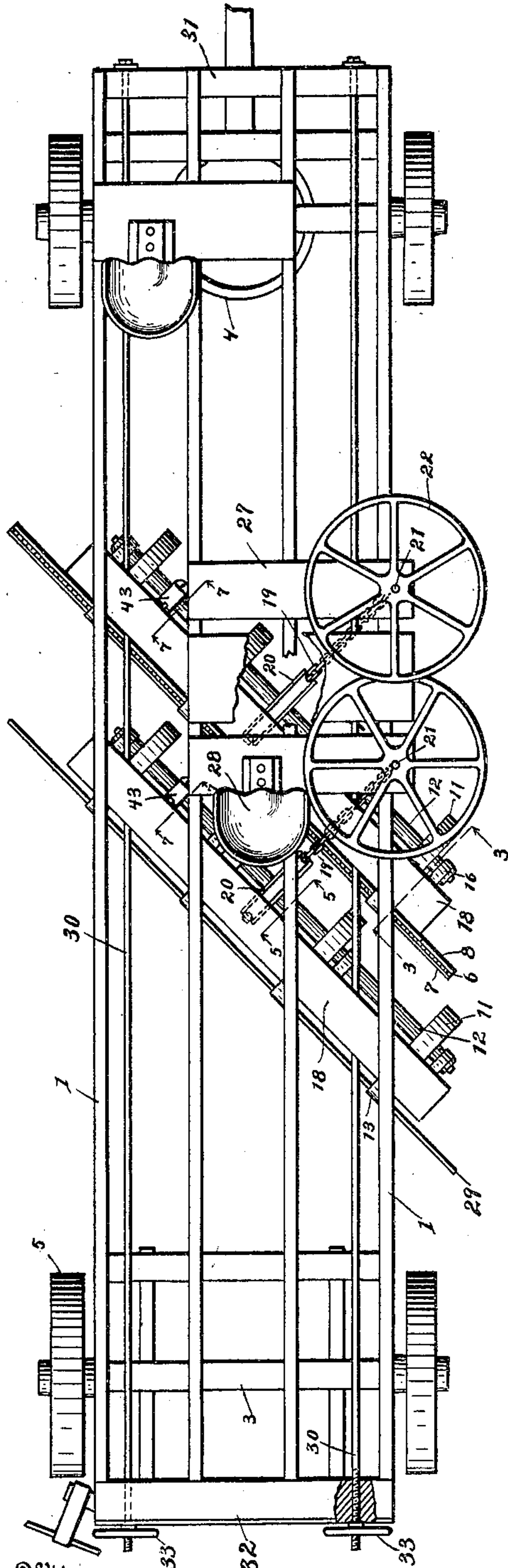


Fig. 1.

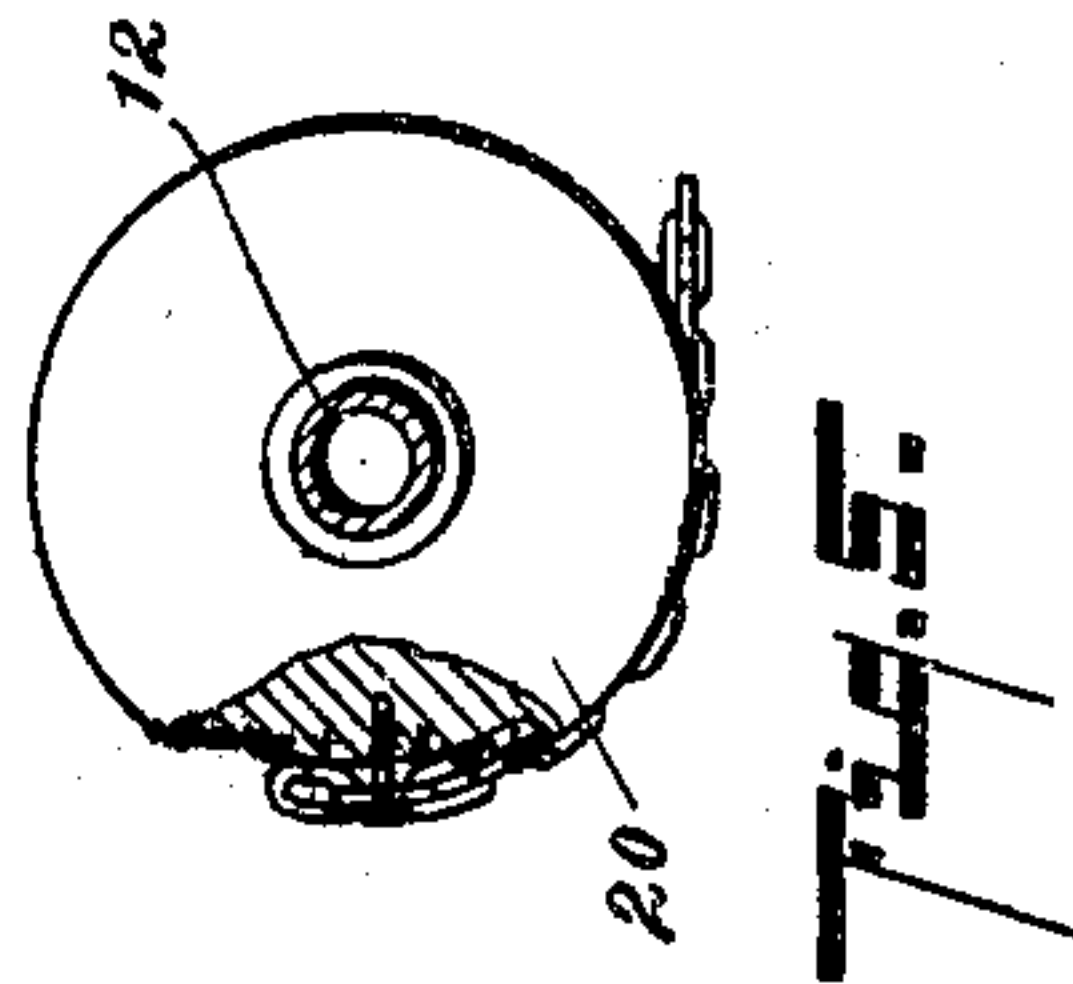


Fig. 2.

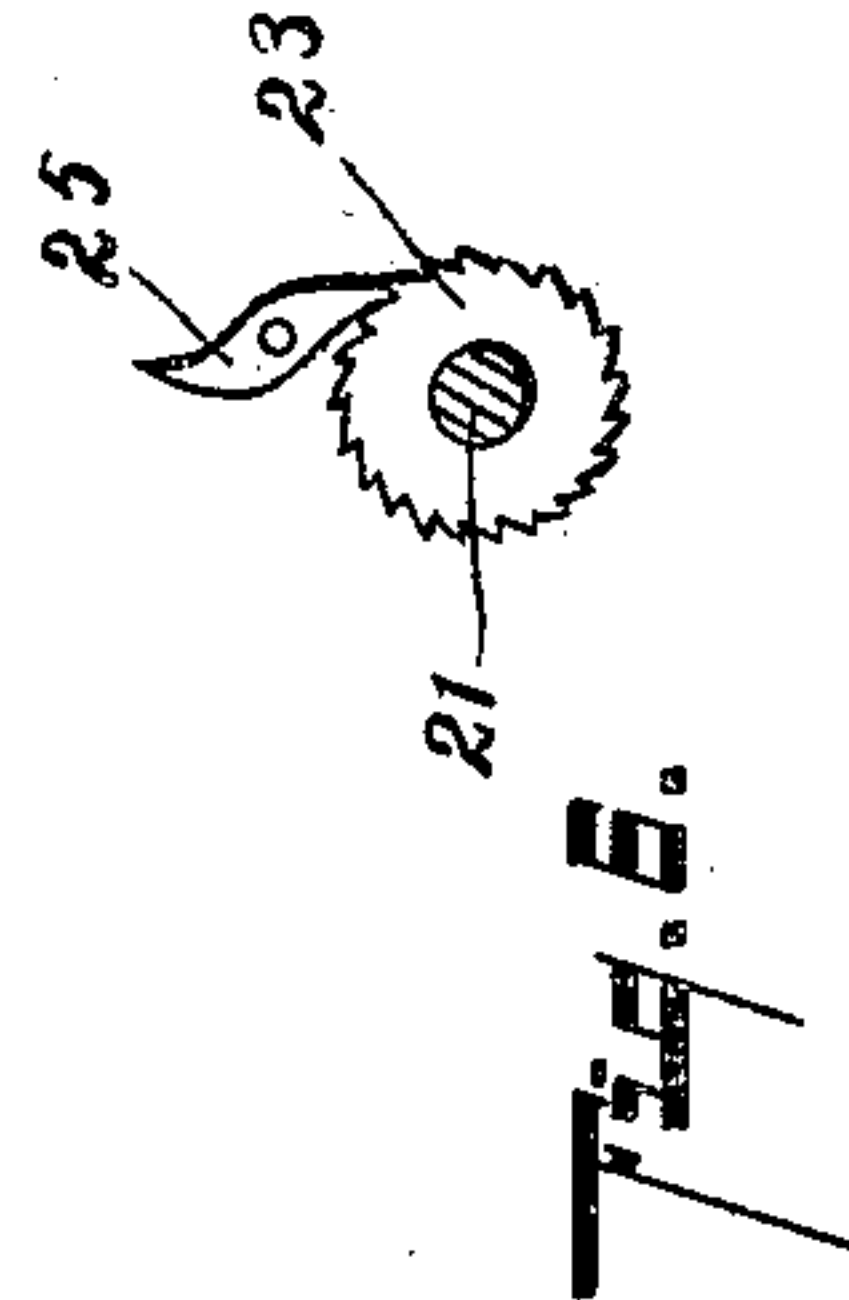


Fig. 3.

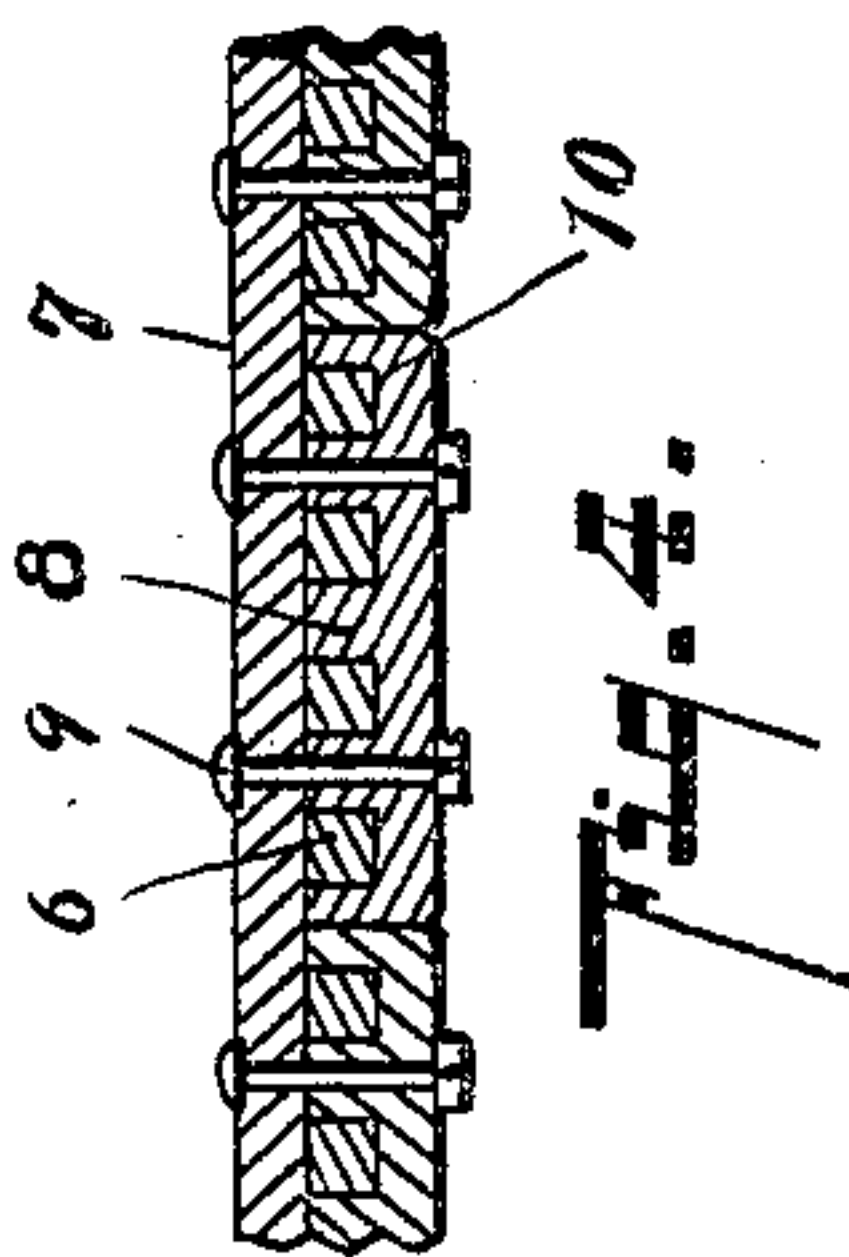


Fig. 4.

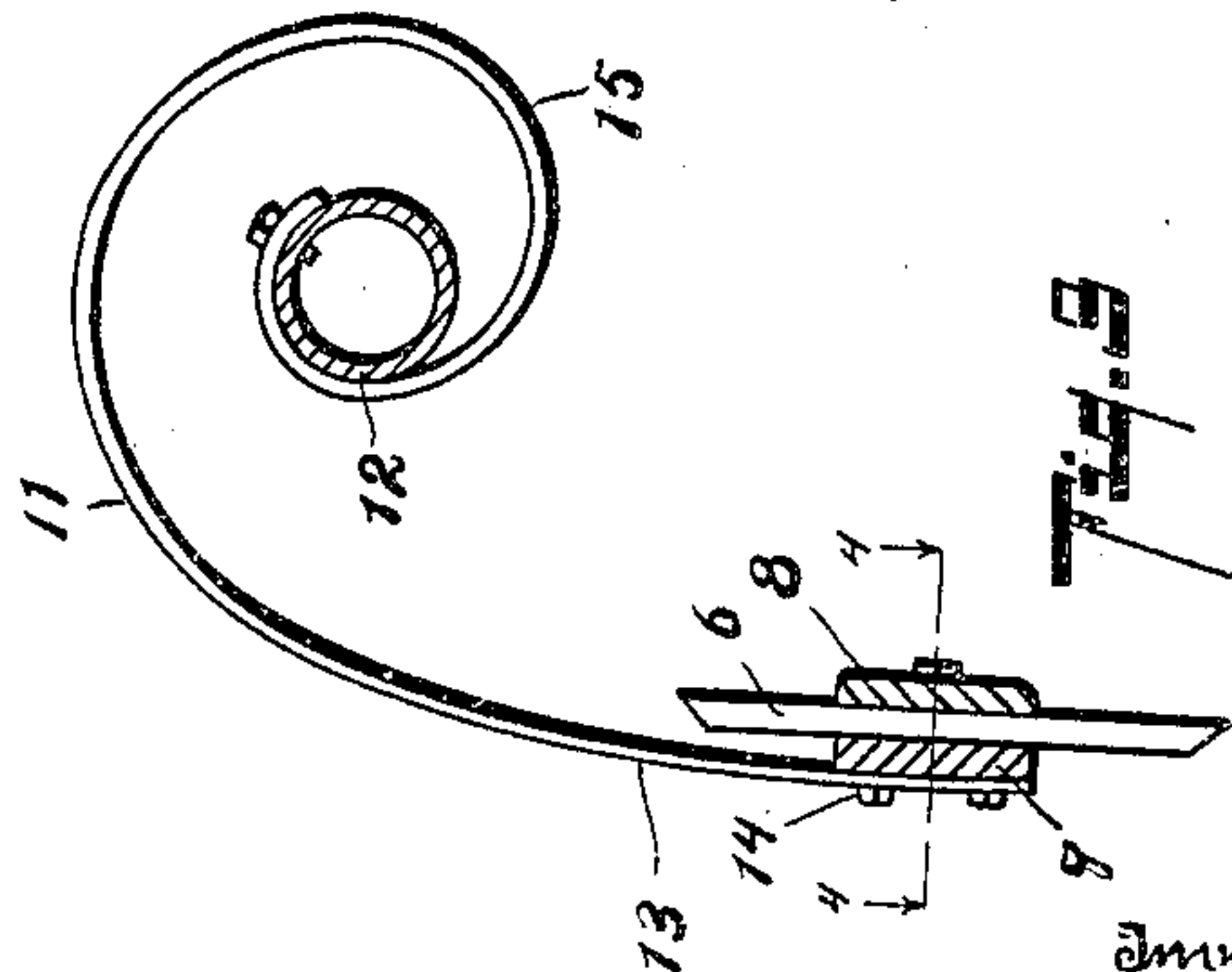


Fig. 5.

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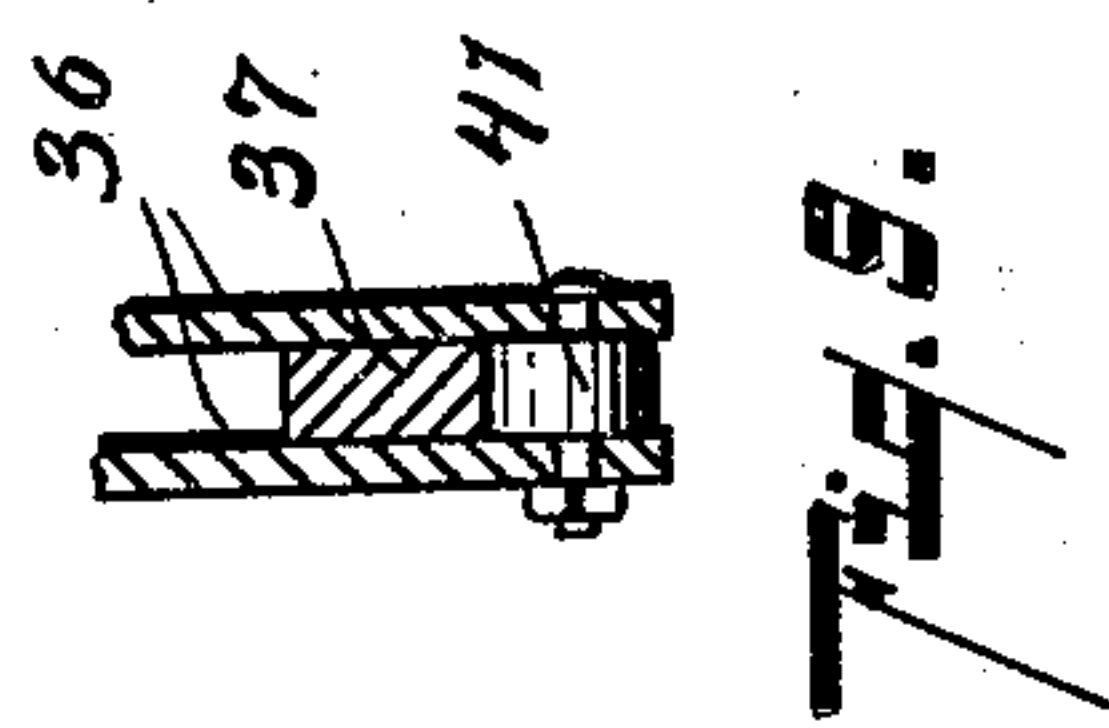
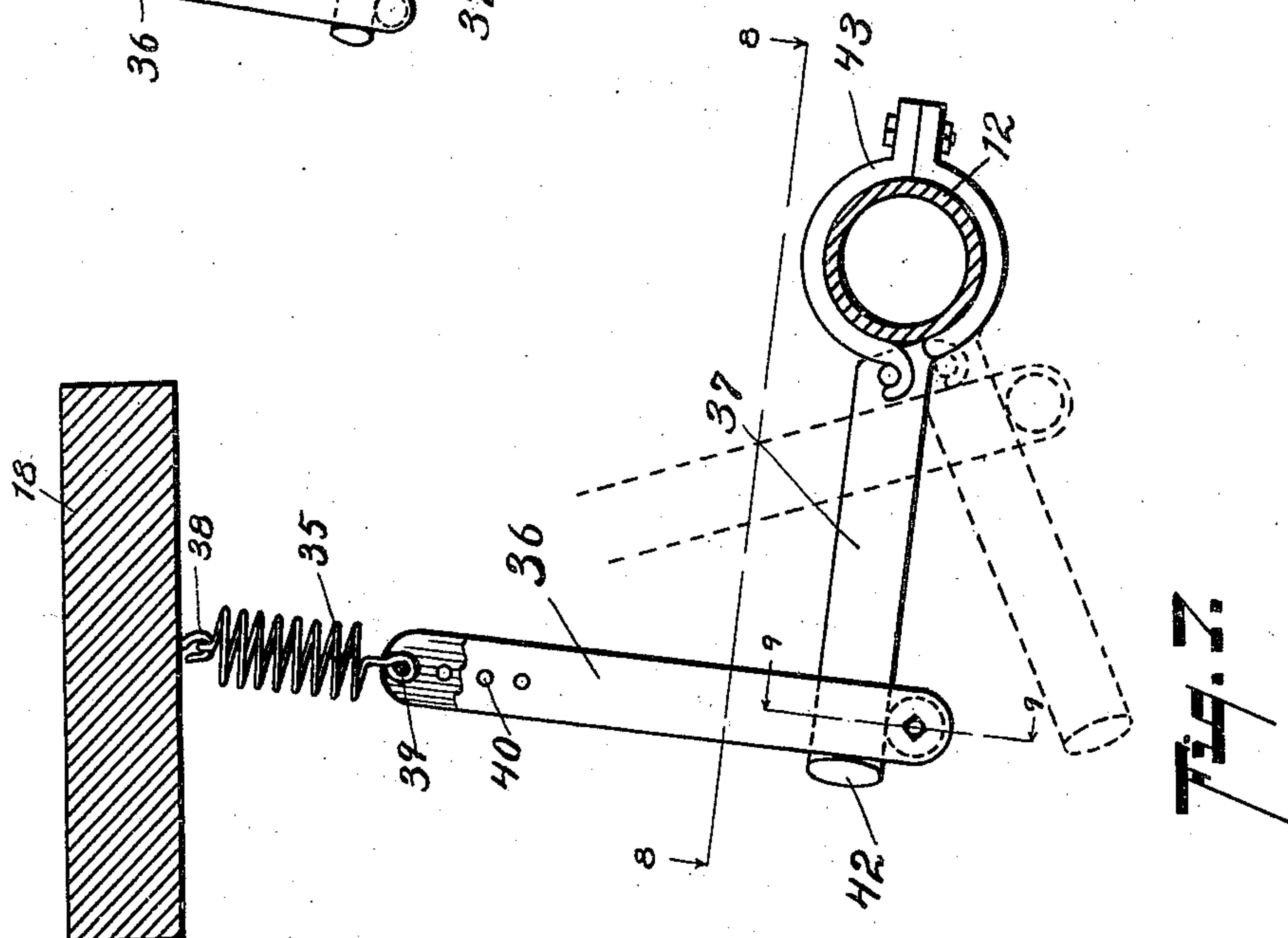
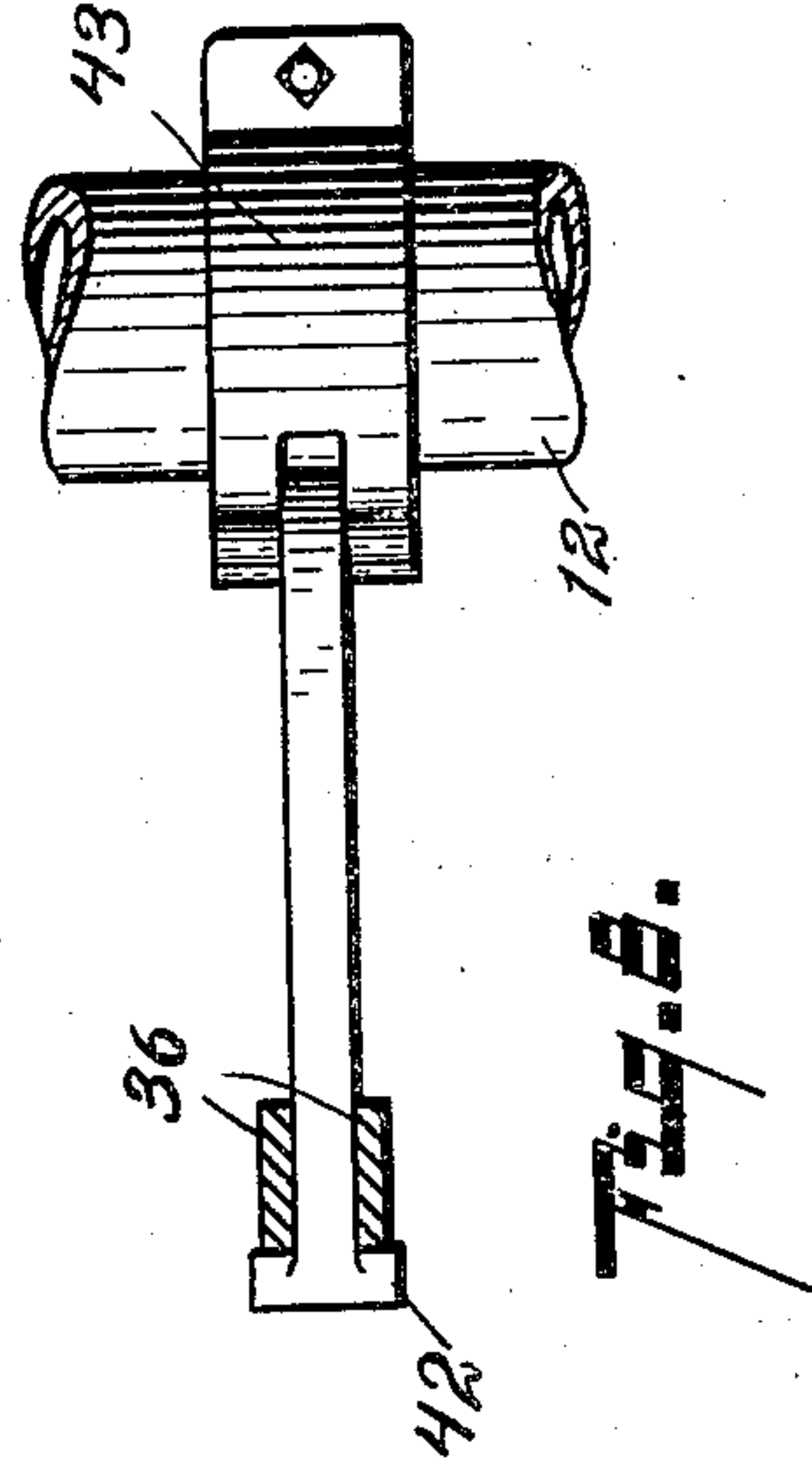
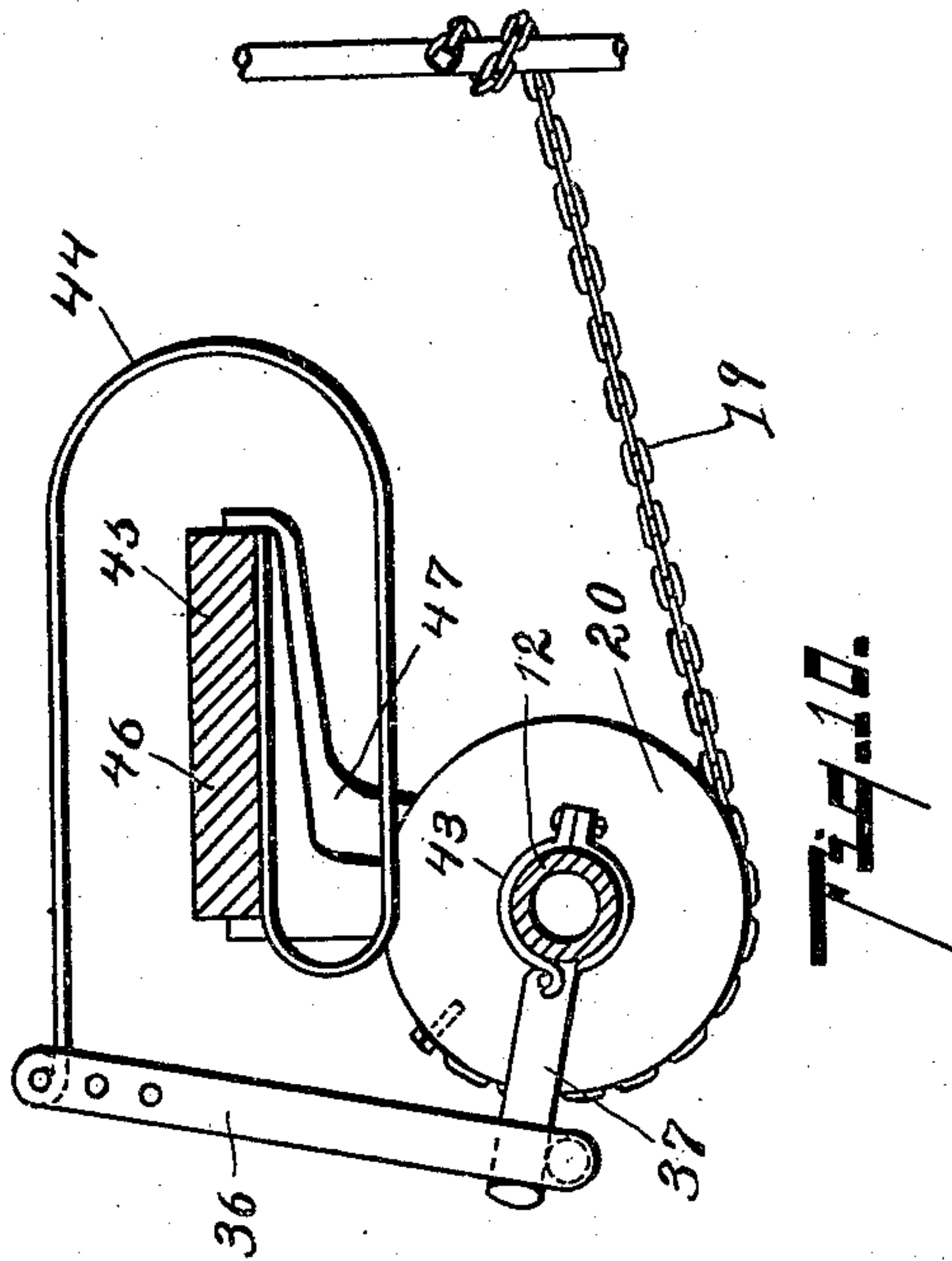
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3 SHEETS—SHEET 3.



Witnesses
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Phineas Woodruff

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UNITED STATES PATENT OFFICE.

FRED N. ROOT, OF KALAMAZOO, MICHIGAN.

ROAD-MACHINE.

934,630.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed September 4, 1908. Serial No. 451,677.

To all whom it may concern:

Be it known that I, FRED N. ROOT, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Road-Machines, of which the following is a specification.

This invention relates to improvements in road machines.

10 The main object of this invention is to provide an improved road machine, by which a roadway or race track may be very effectively surfaced, the hard elevated portions being cut down or removed, and the depres-
15 sions filled in.

Another object is to provide an improved road machine which is comparatively light of draft and easy in operation.

A further object is to provide means for
20 operating the harrow or scraper by which they are easily thrown into operative position and, at the same time, are automatically thrown out of operative position and retained in their elevated or inoperative po-
25 sition.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention
30 by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my
35 invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a perspective view of my improved road machine, a portion of the tongue
40 being broken away. Fig. 2 is a plan view thereof, portions being broken away to better show the relation of the parts. Fig. 3 is an enlarged detail vertical section, taken on a line corresponding to line 3—3 of Fig. 2,
45 showing details of the harrow. Fig. 4 is a horizontal section taken on a line corresponding to line 4—4 of Fig. 3, through the tooth bar and teeth, showing the form and connection therefor. Fig. 5 is a detail ver-
50 tical section, taken on a line corresponding to line 5—5 of Fig. 2, showing details of the connections for throwing the harrow and scraper into and out of operative position. Fig. 6 is an enlarged detail section taken on

a line corresponding to line 6—6 of Fig. 1, 55 showing further details of the controlling means. Fig. 7 is an enlarged detail vertical section taken on a line corresponding to line 7—7 of Fig. 2, showing the means for hold-
60 ing the tools in their elevated position. Fig. 8 is a detail section taken on a line corresponding to line 8—8 of Fig. 7. Fig. 9 is a detail vertical section taken on a line corresponding to line 9—9 of Fig. 7. Fig. 10
65 is a detail vertical section of a modified construction, the supporting spring being in the form of a blade spring instead of the coiled spring illustrated in Fig. 7.

In the drawings, similar reference characters refer to similar parts throughout the
70 several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the running-gear frame or body preferably consists of a
75 plurality of longitudinal sills 1, which are mounted upon the axles 2 by means of suitable bolster pieces 3 at the rear end and by the fifth wheel 4 at the forward end. The
80 wheels 5 illustrated are heavy metal wheels.

Beneath and centrally of the running-gear frame or body I arrange a harrow and a scraper, the harrow being arranged in front of the scraper, and preferably consisting of a plurality of spike-like double ended teeth
85 6, which are carried by a tooth-bar 7, the teeth being secured to the tooth-bar by means of the clips 8 and the bolts 9 arranged therethrough. The clips 8 are provided with
90 a plurality of notch-like seats 10 in their inner faces adapted to receive the teeth, being conformed thereto in cross-section, as illustrated in Fig. 4. These seats or notches
95 are of such a depth that the teeth are clamped against the bar by means of the bolts, thus securing the teeth adjustably and reversibly to the tooth bar. The tooth bar
100 is carried by means of the blade springs 11, which are secured at their upper ends to the rock shaft 12. These springs are preferably provided with substantially straight
105 shank portions 13, which are secured to the bar by the bolts 14 and spirally-coiled portions 15, which are secured to the rock shaft 12. The advantage of this peculiar form of spring in that movement of the spring under tension does not materially change the relative position of the teeth to the surface of

the ground,—that is, they are maintained substantially upright and pressure is effectively applied thereto through the rock shaft; also by the manipulation of the rock shaft, they are thrown into or out of operative position.

The rock shaft is mounted in bearings 16, which are adjustably secured to the hangers 17 depending from the supports 18, which are secured to the under side of the sills. By this adjustable connection for the bearings to the hangers, the parts can be adjusted to bring them in the proper position for use. The rock shaft 12 is preferably actuated by means of the chain 19, which is secured to a drum 20 on the rock shaft, the other end of the chain being wrapped about the shaft 21 of the hand wheel 22. By this connection, the rock shaft may be either thrown out of or into its operative position and the harrow teeth may be held in or out of their engaging position, and are held in their engaging position under the desired pressure or tension. The shaft 21 of the hand wheel is arranged through the platform 27, the hand wheel being arranged to be manipulated by the operator occupying the seat 28, the ratchet wheels and pawls being located above the platform so as to be manipulated by the feet of the operator. The teeth 6 are preferably provided with flat surfaces and are arranged in alinement and close together on the tooth bar, the tooth bar being supported diagonally of the sills 1, as clearly appears from the drawing.

To the rear of the harrow is arranged the scraper, which preferably consists of the scraper blade 29, which is preferably supported and operated in the same manner as the harrow tooth bar; and, as these parts illustrated herein are substantially identical, the operation and manipulation of the scraper will be clearly understood, I do not therefore refer to the parts thereof in detail. The scraper blade is preferably arranged substantially parallel with the harrow.

In operation, the ground is loosened by the harrow and partially leveled thereby, the scraper further leveling the same.

In the event that there should be projections or hard places in the road bed, the harrow acts upon these, and it will be obvious that the greatest pressure is applied to the highest projections,—that is, the entire power of the supporting springs is applied to those portions of the teeth which are in engagement with the ground, so that small hard projections are effectively leveled and the teeth do not enter depressions, and therefore do not loosen the soil which it is desired to leave undisturbed or unloosened.

My improved road machine is especially desirable for race tracks, owing to the fact that a perfectly smooth surface can be pro-

duced and a loosened or cushion surface secured if desired. However, it is very desirable for use on streets and roads generally.

Owing to the fact that it is desirable that the body or running-gear frame should be of considerable length, I preferably provide the sills 1 with trusses consisting of the truss rods 30, which are arranged through the end pieces 31 and 32 of the running-gear frame, the truss rods being passed under the supporting bars 18, which form truss blocks therefor. The truss rods are preferably adjusted by means of the hand wheels 33, which are threaded upon the rear ends of the rods, so that they may be readily adjusted, not only to properly truss the longitudinal sills 1, but also to effectively adjust the supporting bar 18 by which the harrow and scraper are carried. This I find to be of very great convenience, as it avoids the necessity for great care in manufacture and enables the readjustment of the parts to compensate for wear or springing or warping thereof.

I preferably provide a scraper 34, arranged at the rear of the left hand rear wheel, the object being to cover the wheel track, which is especially desirable in race-track work. This scraper is supported by a spring 11 and rock shaft 12, substantially the same as the supports for the scraper blade 29.

The tools are supported in their inoperative position by means of the springs 35 which are connected to the rock shaft by the links 36 and the arm 37 on the rock shaft. The spring 35 is preferably connected to one of the supporting bars 18 by means of the hook 38 and to the link by means of the pin 39, which may be adjusted in the holes 40 of the link to vary the tension on the spring. The lower end of the link is arranged to slidably engage the arm 37, being preferably provided with a bearing roller 41 adapted to travel on the inner side of the arm. The link is preferably formed of two pieces arranged to embrace the arm, as shown in the drawing, thereby securing a balanced structure. On the end of the arm is a cross piece 42 for retaining the link thereon. The arm is preferably secured to the rock shaft by means of the clip 43.

If desired, the adjustment of the spring may be affected somewhat at this point, but it is desirable that the arm be arranged in a certain relation relative to the link so that the link travels freely therein when the rock shaft is actuated.

In the modified construction shown in Fig. 10, a U-shaped blade spring 44 is provided, one arm, as 45, of the spring being secured to the support 46 for the rock shaft hangers 47. The free arm of the spring is connected to the link 36. By thus arranging the parts,

the tools are effectively supported in their inoperative position, and, at the same time, it can be easily thrown into operative position and the supporting springs therefor do not act materially against the tension of the supporting springs for the tools.

My improved road machine is comparatively easy to operate,—that is, it is comparatively light of draft on account of the hard portions of the road bed being loosened and partially smoothed down by the harrow, the scraper completing the same so that the work is done by means best adapted to the end; and, owing to the supports and connections for the parts, the work of the operator is comparatively light.

I have illustrated and described my improvements in detail in the form preferred by me on account of structural simplicity and economy thereof, and their convenience in use. I am, however, aware that the structure may be very greatly varied without departing from my invention, and I desire to be understood as claiming the same specifically as illustrated, as well as broadly.

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

1. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of teeth secured to said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto, a supporting bar, rock shaft hangers on said supporting bar, and bearings for said rock shaft, adjustably secured to said hangers; and a scraper, comprising a scraper blade arranged substantially parallel with said harrow tooth bar, a rock shaft, supporting springs for said scraper blade, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, supporting bars, rock shaft hangers carried thereby, bearings for said rock shaft adjustably secured to said hangers, and means for actuating said rock shaft to throw said scraper blade into and out of operative position and apply pressure thereto.

2. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of teeth secured to said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto, a supporting bar,

rock shaft hangers on said supporting bar, and bearings for said rock shaft, adjustably secured to said hangers; and a scraper blade arranged substantially parallel with said harrow tooth bar, a rock shaft, supporting springs for said scraper blade, secured thereto and to said rock shaft, supporting bars, rock shaft hangers carried thereby, bearings for said rock shaft adjustably secured to said hangers, and means for actuating said rock shaft to throw said scraper blade into and out of operative position and apply pressure thereto.

3. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of teeth secured to said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto, bearings for said rock shaft, and an adjustable support therefor; and a scraper comprising a scraper blade arranged substantially parallel with said harrow tooth bar, a rock shaft, supporting springs for said scraper blade, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, bearings for said rock shaft, an adjustable support therefor, and means for actuating said rock shaft to throw said scraper blade into and out of operative position and apply pressure thereto.

4. In a structure of the class described the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of teeth secured to said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto, and a scraper comprising a scraper blade arranged substantially parallel with said harrow tooth bar, a rock shaft, supporting springs for said scraper blade, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, and means for actuating said rock shaft to throw said scraper blade into and out of operative position and apply pressure thereto.

5. In a structure of the class described, the combination with the running-gear frame, of a harrow comprising a plurality of rigid teeth, a tooth bar to which said teeth are secured, a rock shaft, supporting springs secured to said tooth bar and said rock shaft, said springs having spiral coils at their up-

per ends, and means for actuating said rock shaft; and a scraper arranged at the rear of said harrow, comprising a scraper blade, a rock shaft, supporting springs for said scraper blade secured thereto and to said rock shaft, said springs having spiral coils at their upper ends, and means for actuating said rock shaft, said harrow and scraper being arranged diagonally of the running-gear frame and substantially parallel.

6. In a structure of the class described, the combination with the running-gear frame, of a harrow comprising a plurality of rigid teeth, a tooth bar to which said teeth are rigidly secured, means for yieldingly holding said teeth in their operative position and applying pressure thereto; and a scraper comprising a scraper blade, and means for yieldingly holding said scraper blade in operative position and applying pressure thereto, said scraper being arranged at the rear of said harrow substantially parallel thereto, said scraper and harrow being arranged diagonally of the running-gear frame.

7. In a structure of the class described, the combination with the running-gear frame, of a harrow comprising a plurality of rigid teeth, a tooth bar to which said teeth are secured, a rock shaft, supporting springs secured to said tooth bar and said rock shaft, said springs having spiral coils at their upper ends, and means for actuating said rock shaft; and a scraper arranged at the rear of said harrow, said harrow and scraper being arranged diagonally of the running-gear frame and substantially parallel.

8. In a structure of the class described, the combination with the running-gear frame, of a harrow comprising a plurality of rigid teeth, a tooth bar to which said teeth are secured, a rock shaft, supporting springs secured to said tooth bar and said rock shaft, said springs having spiral coils at their upper ends, and means for actuating said rock shaft; and a scraper arranged at the rear of said harrow.

9. In a structure of the class described, the combination with the running-gear frame, of a harrow comprising a plurality of rigid teeth, a tooth bar to which said teeth are rigidly secured, means for yieldingly holding said teeth in their operative position and applying pressure thereto; and a scraper arranged at the rear of said harrow.

10. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of straight spike-like teeth rigidly secured to said bar, said teeth being arranged in alignment close together on said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, said springs having spiral coils at their ends con-

nected to said rock shaft, means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto, a supporting bar, rock shaft hangers on said supporting bar, and bearings for said rock shaft, adjustably secured to said hangers.

11. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of straight, spike-like teeth rigidly secured to said bar, said teeth being arranged in alignment close together on said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, and means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto.

12. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of straight, spike-like teeth rigidly secured to said bar, said teeth being arranged in alignment close together on said bar, and means for yieldingly supporting said tooth bar and applying pressure thereto.

13. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of teeth secured to said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto, bearings for said rock shaft, and an adjustable support therefor.

14. In a structure of the class described, the combination with the running-gear, of a harrow comprising a tooth bar arranged diagonally of the running-gear, a plurality of teeth secured to said bar, a rock shaft, supporting springs for said tooth bar, secured thereto and to said rock shaft, said springs having spiral coils at their ends connected to said rock shaft, and means for actuating said rock shaft to throw said teeth into and out of operative position and to apply pressure thereto.

15. In a structure of the class described, the combination with the running-gear frame, of a harrow comprising a plurality of rigid teeth, a tooth bar to which said teeth are rigidly secured, a rock shaft, supporting springs secured to said tooth bar and said rock shaft, said springs having spiral coils at their upper ends, and means for actuating said rock shaft.

16. In a structure of the class described,

the combination with the running-gear frame, of a harrow comprising a plurality of rigid teeth, a tooth bar to which said teeth are rigidly secured, and hanger springs for said tooth bar through which pressure may be applied thereto and by which said tooth bar is yieldingly supported and carried.

17. In a structure of the class described, the combination with the carrying wheels, of a body comprising a plurality of longitudinal sills, end pieces, a scraper, a harrow, supporting bars for said scraper and harrow arranged diagonally under said longitudinal sills, a pair of truss rods secured to said end pieces, arranged under said supporting bars toward the ends thereof, and hand wheels threaded upon said truss rods for adjusting the same, whereby the sills are trussed and said supporting bars adjusted.

18. In a structure of the class described, the combination with the carrying wheels, of a body comprising a plurality of longitudinal sills, end pieces, a scraper, a harrow, supporting bars for said scraper and harrow arranged diagonally under said longitudinal sills, a pair of truss rods secured to said end pieces, arranged under said supporting bars toward the ends thereof, and means for adjusting the same, whereby the sills are trussed and said supporting bars adjusted.

19. In a structure of the class described, the combination with the carrying wheels, of a body comprising a plurality of longitudinal sills, a scraper, a harrow, supports for said scraper and harrow carried by said sills, a pair of truss rods, and means for adjusting said truss rods, whereby the sills are trussed and said supports adjusted.

20. In a structure of the class described, the combination with the carrying wheels, of a body comprising a plurality of longitudinal sills, a support carried by said sills, a pair of truss rods, and means for adjusting said truss rods, whereby the sills are trussed and said support adjusted.

21. In a structure of the class described, the combination with a rock shaft, of hangers therefor; a support for said hangers; a tool; supporting springs for said tool carried by said rock shaft; means for actuating said rock shaft; an arm on said rock shaft; a spring carried by said support; and a link pivotally connected to said spring and slidably connected to said arm on said rock shaft.

22. In a structure of the class described, the combination with a tool to be adjusted, of a rock shaft for actuating said tool; means for actuating said rock shaft; an arm on said rock shaft; a spring for supporting said tool in its inoperative position; a link pivotally connected to said spring and slidably connected to said arm on said rock shaft; and a bearing roller for said arm carried by

said link; said spring and arm being so arranged that said link shifts on said arm toward said rock shaft when the rock shaft is actuated to adjust the tool into its operative position and from said rock shaft when the rock shaft is actuated to adjust the tool to its inoperative position.

23. In a structure of the class described, the combination with the tool to be adjusted, of a rock shaft for actuating said tool; means for actuating said rock shaft; an arm on said rock shaft; a spring for supporting said tool in its inoperative position; and a link pivotally connected to said spring and slidably connected to said arm on said rock shaft, said spring and arm being so arranged that said link shifts on said arm toward said rock shaft when the rock shaft is actuated to adjust the tool into its operative position and from said rock shaft when the rock shaft is actuated to adjust the tool to its inoperative position.

24. In a structure of the class described, the combination with the tool to be adjusted, of a rock shaft for actuating said tool; means for actuating said rock shaft; an arm on said rock shaft; a spring for supporting said tool in its inoperative position; and a slidable connection for said spring to said arm on said rock shaft, said spring and arm being arranged so that said connection for said spring to said arm shifts on said arm toward said rock shaft when the rock shaft is actuated to adjust the tool into its operative position and from said rock shaft when the rock shaft is actuated to adjust the tool to its inoperative position.

25. In a structure of the class described, the combination with the tool to be adjusted, of a rock shaft for actuating said tool; means for actuating said rock shaft; an arm adjustably secured to said rock shaft; a spring for supporting said tool in its inoperative position; and a slidable connection for said spring to said arm on said rock shaft, said spring and arm being arranged so that said connection for said spring to said arm shifts on said arm toward said rock shaft when the rock shaft is actuated to adjust the tool into its operative position and from said rock shaft when the rock shaft is actuated to adjust the tool to its inoperative position.

26. In a structure of the class described, the combination with a rock shaft, of hangers therefor; a support for said hangers; a tool; supporting springs for said tool carried by said rock shaft; means for actuating said rock shaft; an arm on said rock shaft; a U-shaped blade spring having one arm secured to the under side of said support and its free arm projecting rearwardly above the same; a link pivoted on said spring adapted to slidably embrace said arm; and a bearing roller for said arm carried by said link.

27. In a structure of the class described,

the combination with a rock shaft, of hangers therefor; a support for said hangers; a tool; supporting springs for said tool carried by said rock shaft; an arm on said rock shaft; a U-shaped blade spring having one arm secured to said support; and a link pivotally connected to said spring and slidably connected to said arm.

In witness whereof, I have hereunto set my hand and seal in the presence of two 10 witnesses.

FRED N. ROOT. [L. s.]

Witnesses:

CLORA E. BRADEN,
PHINA WOODRUFF.