

No. 709,592.

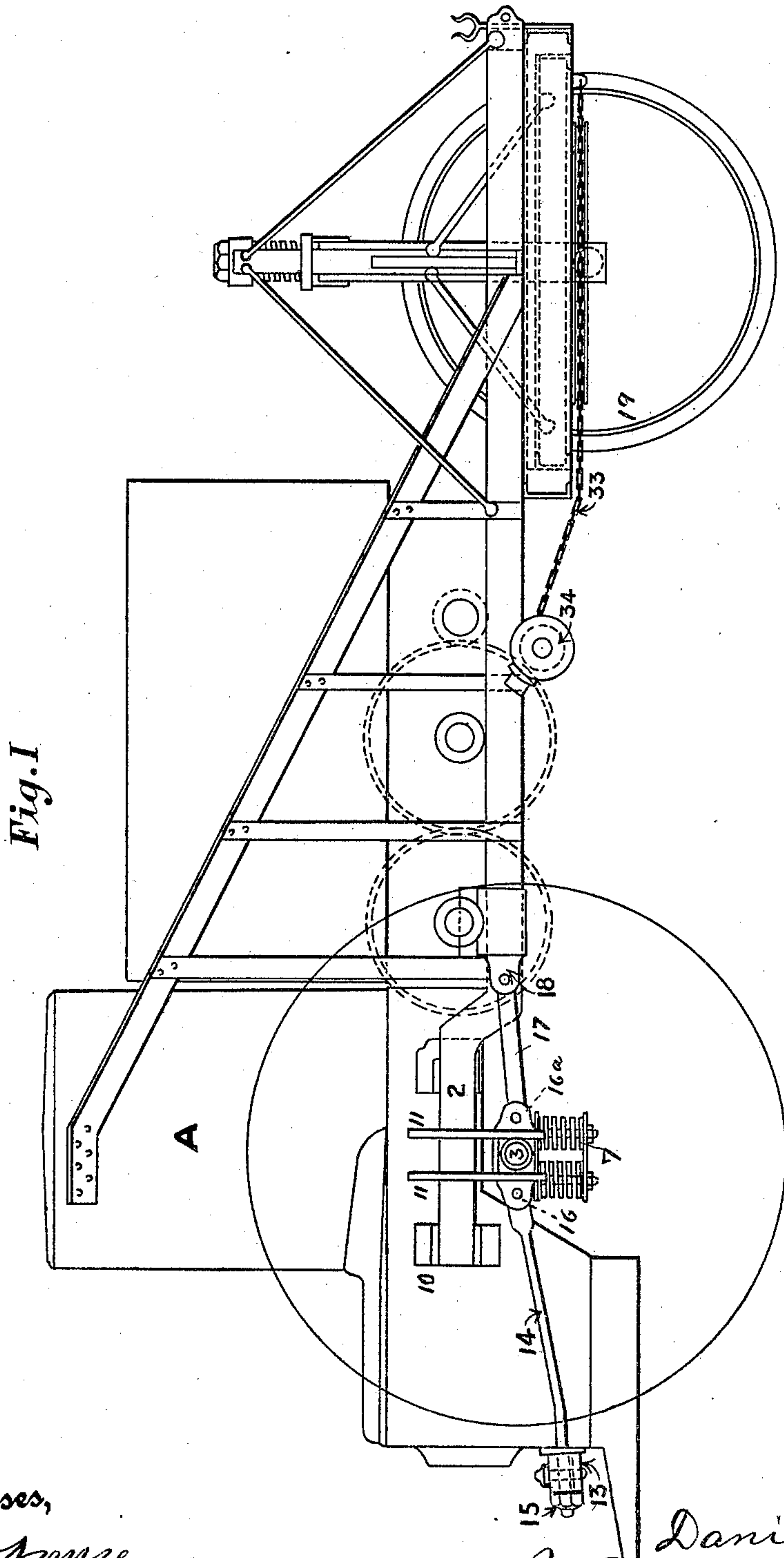
Patented Sept. 23, 1902.

D. BEST.
TRACTION ENGINE.

(Application filed June 23, 1902.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,

St. Monroe
Chas. E. Townsend

Inventor,
Daniel Best
By *Dwight Strong* Atty.

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Fig. 2

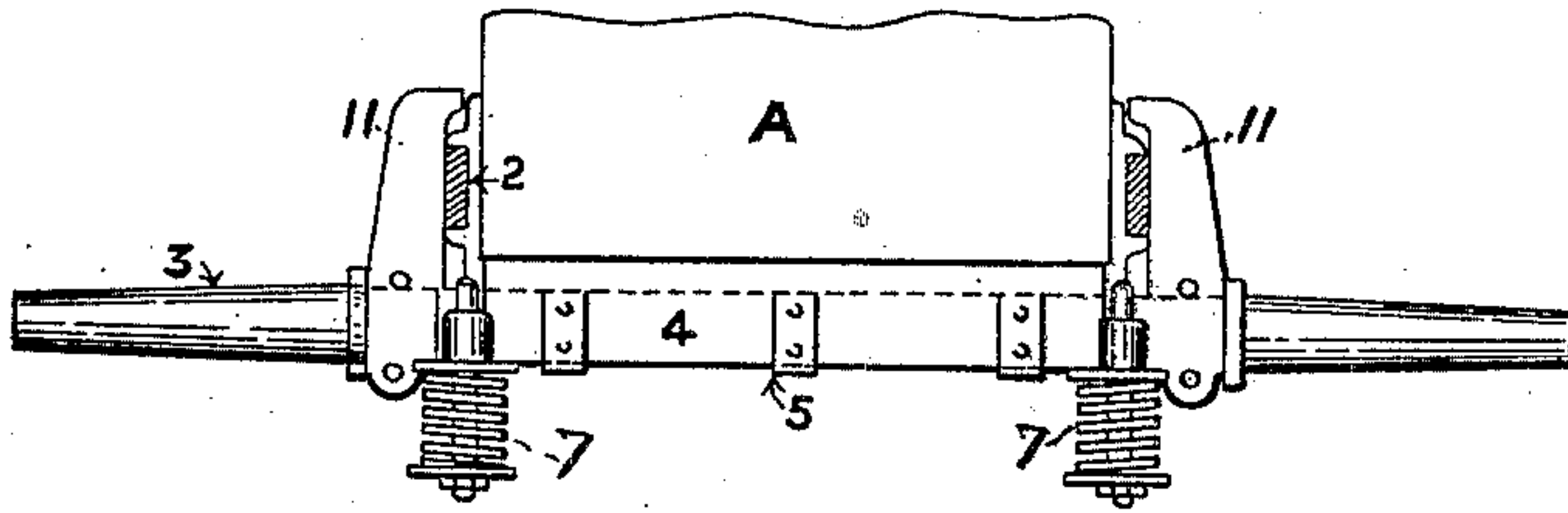


Fig. 3

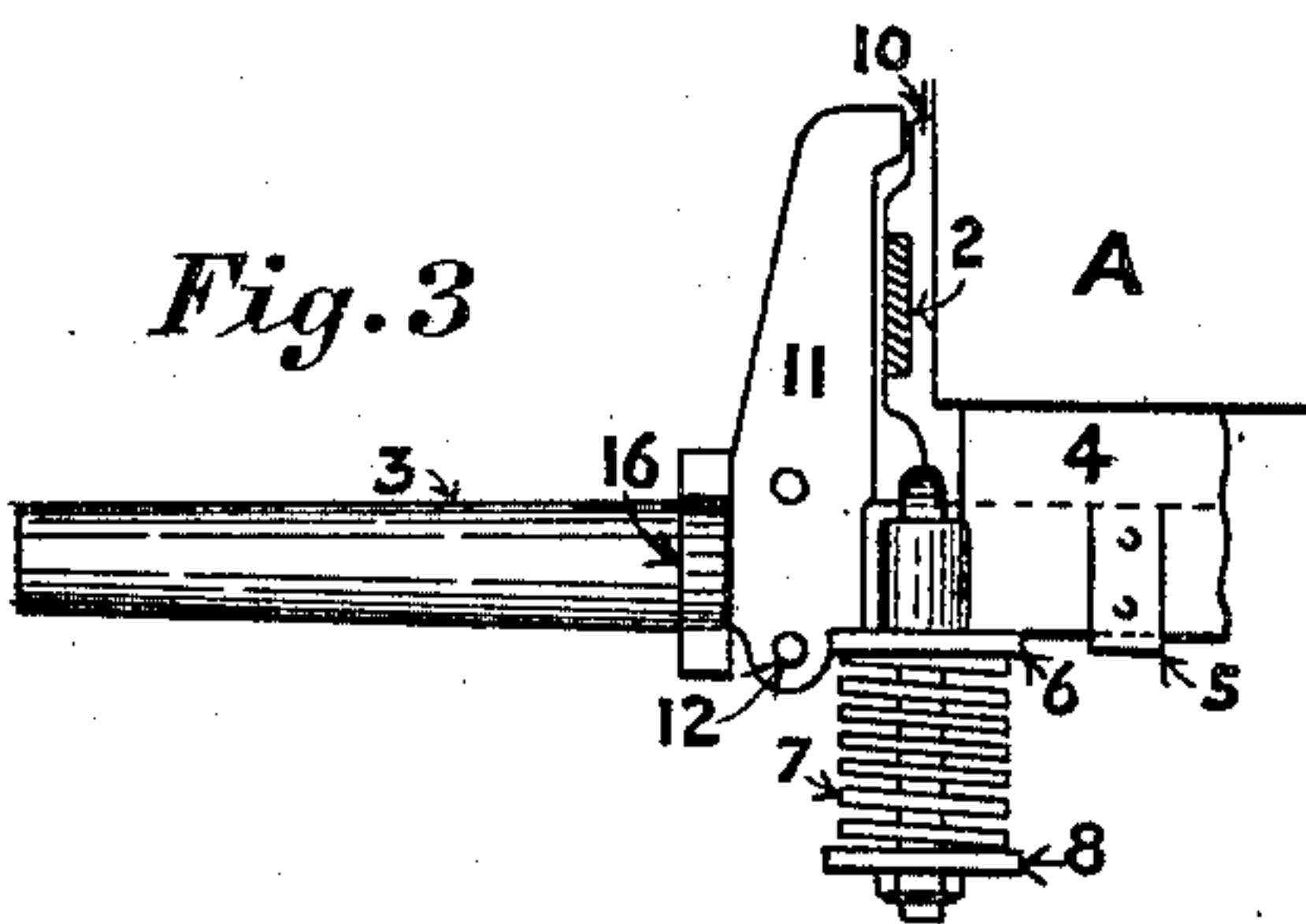


Fig. 4

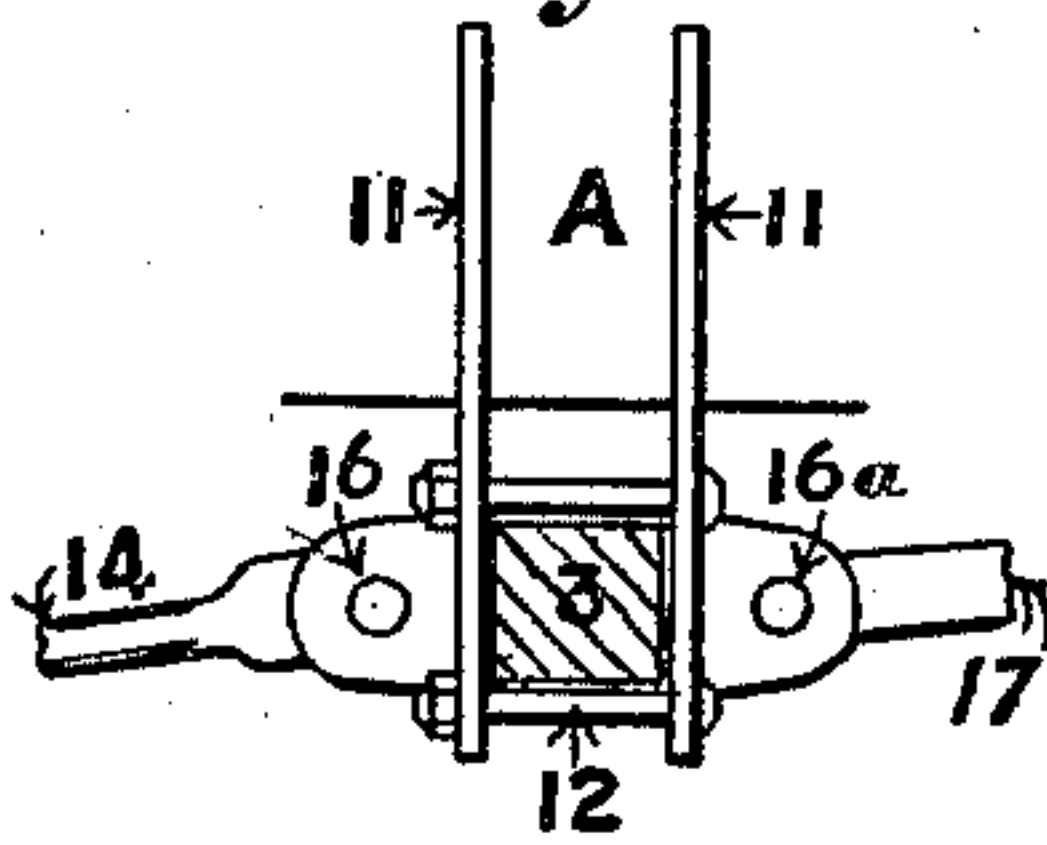


Fig. 5

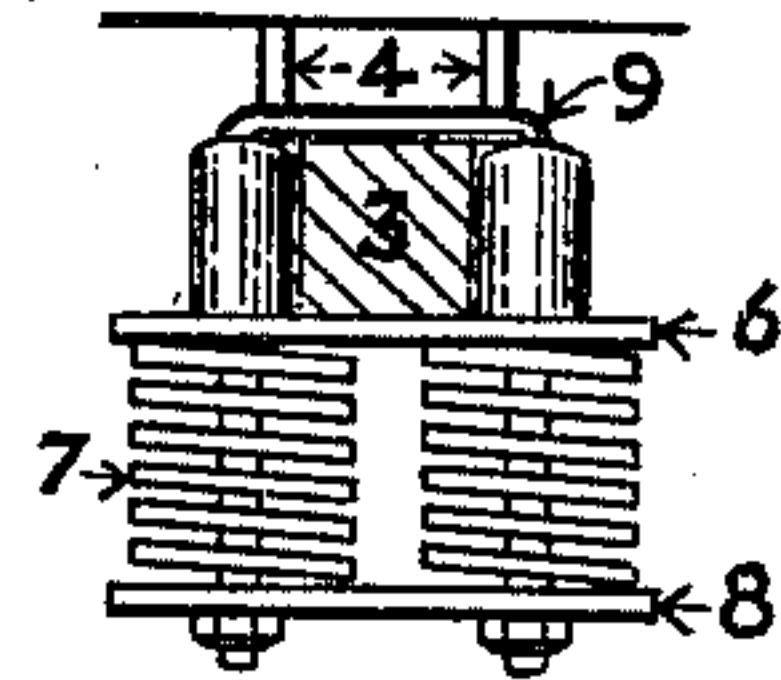


Fig. 6

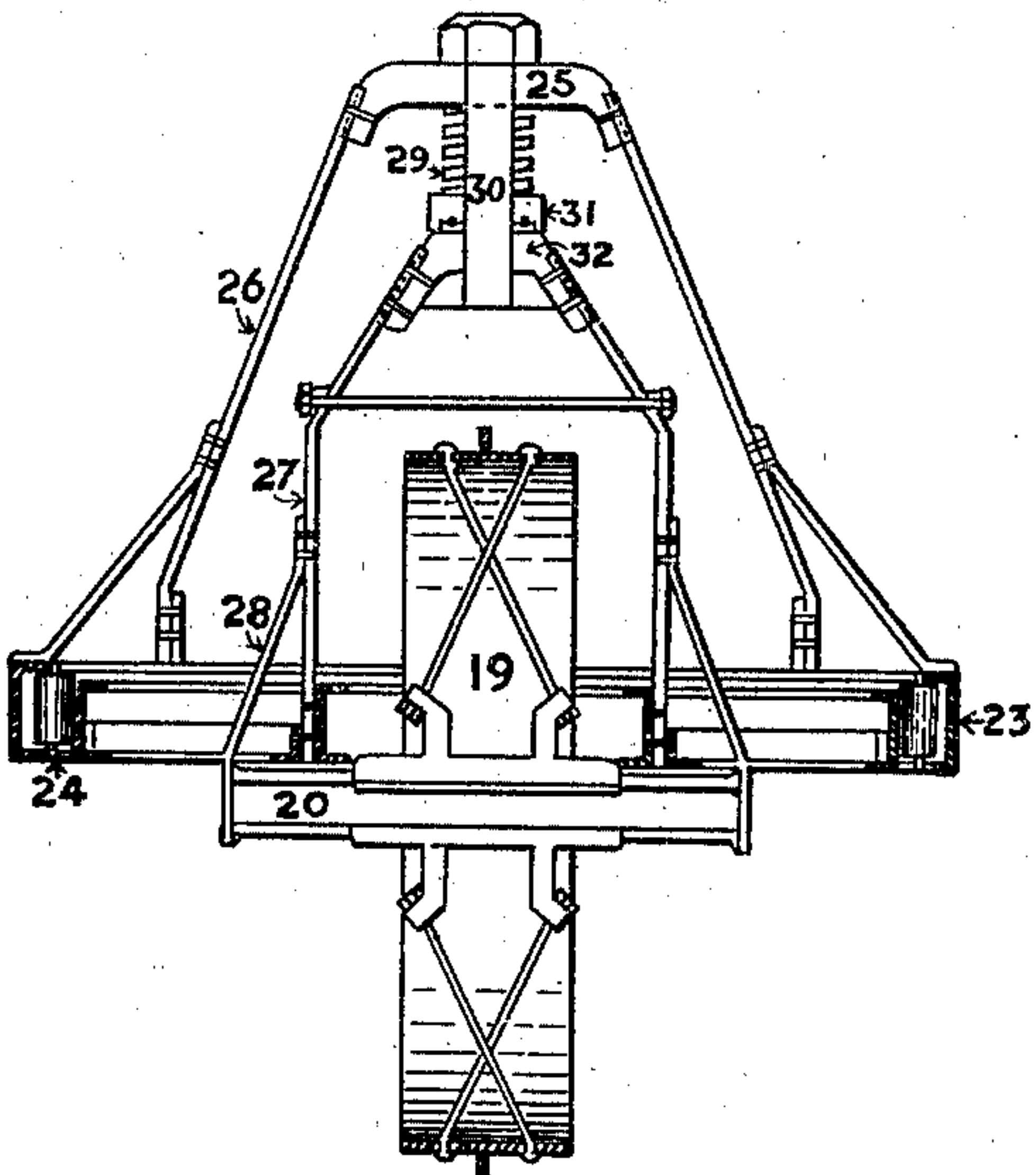
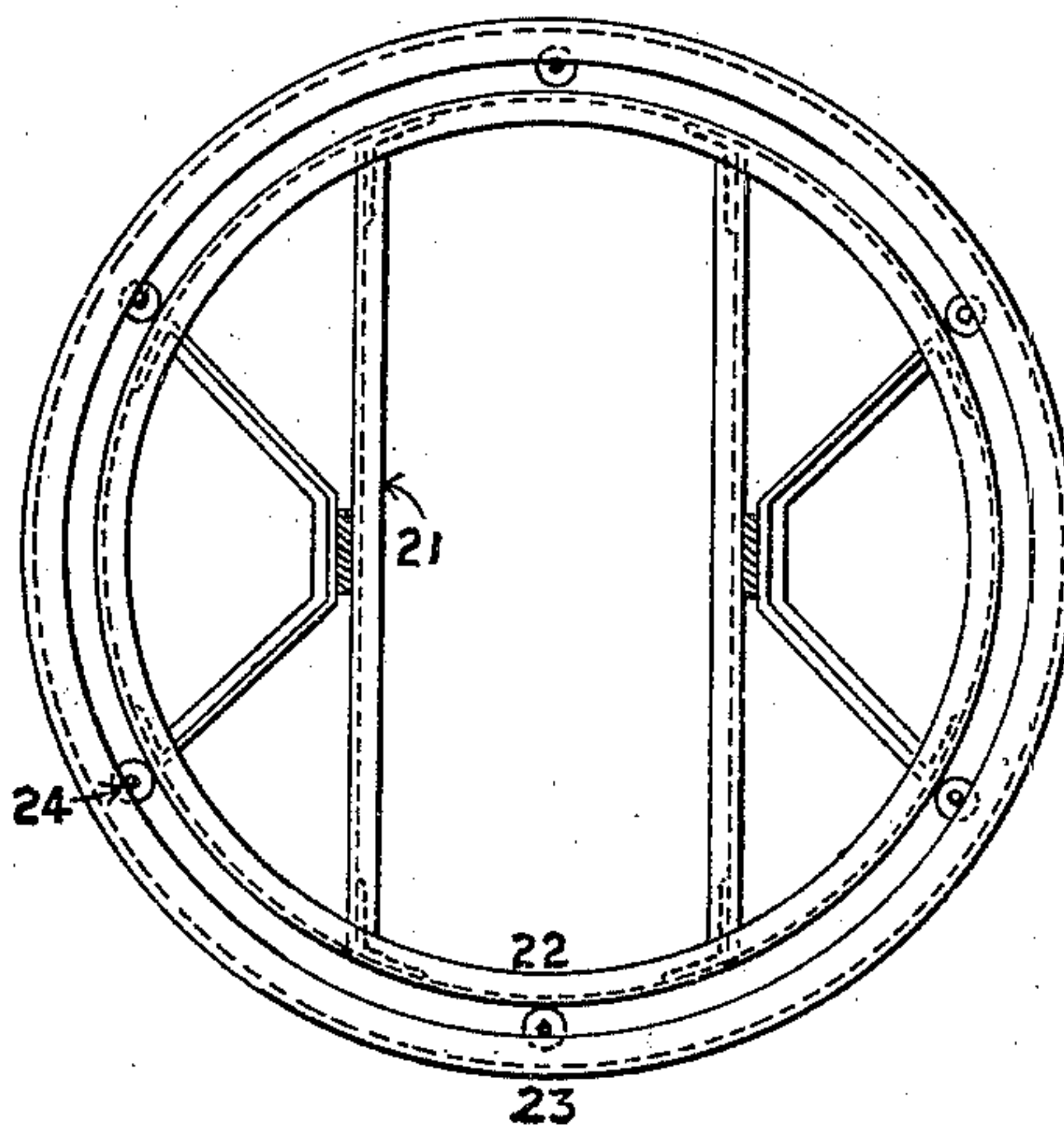


Fig. 7



Witnesses,
Chas E. Townsend

Inventor,
Daniel Best
By *Dwight Strong* atty

UNITED STATES PATENT OFFICE.

DANIEL BEST, OF SAN LEANDRO, CALIFORNIA.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 709,592, dated September 23, 1902.

Application filed June 23, 1902. Serial No. 112,777. (No model.)

To all whom it may concern:

Be it known that I, DANIEL BEST, a citizen of the United States, residing in San Leandro, county of Alameda, State of California, have
5 invented an Improvement in Traction-Engines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in
10 traction-engines.

It consists of the parts and the constructions and combinations of parts hereinafter described and claimed.

Figure 1 is a side elevation. Fig. 2 is a partial transverse section showing the main axle, springs, and supports. Fig. 3 is a similar
15 view of one end of the axle and parts. Fig. 4 is a partial side view showing draft-rods and connections. Fig. 5 is a similar view showing
20 the main axle and the springs. Fig. 6 is a vertical transverse section of the steering-wheel. Fig. 7 is a plan view of the steering-wheel frame.

It is the object of my invention to provide
25 an elastic support for the boiler, engine, and supporting-frame of a traction-engine, and such connection between the frame and the bearing-wheels and axle thereof that the movement of the supported parts upon the
30 springs will not interfere with the proper meshing of the gears by which power is transmitted from the engine to the gears upon the main bearing-wheel whereby the latter are revolved.

As shown in the accompanying drawings, the engine consists of a vertical boiler A, mounted upon a suitable frame, as at 2, and said frame also carrying a water-tank, a fuel-supply, such as oil-tanks or the like, and hav-
35 ing an engine and suitable connections with gears, through which power is applied by the intermeshing of said gears with internal gears upon the main traction-wheels. These forming no special part of my present application
40 are either not shown or only partially indicated. The main shaft or axle 3 has spindles formed upon its outer ends, upon which the main bearing and traction wheels are turnable. The interior portion of the axle lies in
45 between plates 4, which are set on edge and have a sufficient depth between the top and

the bottom to allow ample space for the vertical movement upon the springs. These plates are secured in place by bent angle-ties 5, extending across the bottom and up the sides and
55 riveted to the plates by rivets which are countersunk on the inside of the plates, so as to present no projection toward the axle. The portion of the axle which lies in this trough thus formed is substantially square, and the bot-
60 tom of the boiler is supported upon these plates 4. The ends of the plates 4 are supported upon horizontal transverse plates 6, which rest upon the top of the springs 7. These springs are here shown as coiled springs
65 and may consist of a plurality of such springs, one coiled within the other to give sufficient strength to support the weight of the machine. The lower ends of the springs rest upon the horizontal transverse plates 8.
70 Yokes 9 pass over the ends of the axle 3, extending down through the plates 6 and through the center of the springs and through the bottom plates 8, and the lower ends of these yokes are threaded to receive nuts by
75 which they are secured in place, and it will be seen that by this arrangement the yokes resting upon the top of the axle, which is in turn supported by the bearing-wheels, the weight of the engine boiler and frame resting
80 upon the top of the plates 6, which in turn are supported upon the tops of the springs 7, the latter will yield whenever the engine passes over rough roads and will relieve the shock of travel generally.
85

The iron frames 2 have their ends secured upon each side of the boiler by clamping-plates, as shown at 10, and pass thence above the axle and are thence bent downward at an
90 incline and are afterward extended horizontally to form the front portion of the frame. Plates 11 are located upon each side of the axle 3, extending upwardly and having the ends bent into hook form to extend above the iron frame 2. The lower ends are secured
95 to the axle by bolts extending above and below the axle, as shown at 12. These plates limit the vertical oscillation of the machine upon the springs in case it becomes too violent by the overhanging ends striking the
100 frame.

In order to apply the power of the machine

directly and to maintain vertical movement of the parts with relation to each other, I have shown the following construction.

13 is a hollow bar extending across the rear of the boiler, against which it contacts. Through the ends of this bar extend the stout rods 14, which are screw-threaded and are adjusted and kept in place by nuts and washers, as at 15. The front ends of these links or rods 14 are connected with lugs 16, which project from the sides of the rearmost plate 11 substantially opposite to the axle, as shown. From the other or forward plate 11 similar lugs 16^a project, and these are connected by links 17 with lugs 18, fixed to the main frame 2 or some part rigidly connected therewith. These connecting-links 14 and 17 are located upon each side of the machine, and it will be seen by this connection that the pull exerted through the wheels to move the machine will be applied directly to the rear of the boiler and the frame and while the pivoted connections of these links allow a free vertical movement of the parts without any fore and aft displacement.

The front portion of the machine is carried upon a single wheel 19, mounted upon a shaft or axle 20, which is journaled to the parallel frames 21. These frames 21 have their forward and rear ends secured to a ring or annulus 22, which is turnable within an exterior ring 23, both rings being substantially horizontal when the machine stands on a level. Between the ring 22 and the ring 23 are located antifrictional rollers, as at 24, so that the inner ring may turn freely within the outer one without undue friction by reason of the various pressures brought sidewise upon the wheel 19 during its travel. The outer ring 23 forms a stationary part of the main frame, within which the inner one is turnable. Centrally above the wheel 19 is a guide sleeve or box 25, which is supported by stout braces 26, converging thereto from the main frame and the outer ring 23. The inner ring 22 has fixed to it a structure of vertical bars 27, convergent at the top and supported by suitable braces, as at 28, these braces connecting it, so that it is turnable with the inner ring. The convergent upper end of the frame 27 supports a spring 29, upon the upper end of which rests the sleeve or collar 25, and the stout pin or spindle 30 extends from the upper part of the frame 27 through the spring and through the upper sleeve or collar 25, so as to form a guide for the upper part and about which the vertical movement of the spring 29 may take place. I have here shown the spring as resting upon a circular cap 31, which forms the upper member of a circular ball-bearing, the lower member being supported by the cap 32, with which the upper end of the inner frame 27 is connected. It will thus be seen that the parts will have sufficient vertical movement by reason of the yielding of the spring 29 to protect the front portion of the machine from jars incident to its travel in the same man-

ner that the rear portion is protected and supported by the springs 7, and the vertical rollers 24 form a support against which the inner ring is turnable, and at the same time the rollers do not interfere with its vertical movement, as the meeting faces are substantially parallel.

In order to steer the machine, I have shown chains 33, the front ends of which are connected with a circular arc or segment carried by the interior ring 22, and these chains extend from the front part of this segment around each side and back to shafts or drums, as at 34, upon which they may be wound, one being wound up while the other is unwound, so as to turn the steering-wheel from one side to the other. Power may be applied to the winding-shafts, and by means of gearing intermediate between the two shafts one may be turned in one direction simultaneously with the turning of the other in the opposite direction, thus operating the chain.

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

1. The combination in a traction-engine of the frame; the bearing-wheels; the axle; transverse plates forming a channel within which the axle is movable; yokes suspended directly from the axle, and plates through which the ends of the yoke pass; and springs disposed between the last-named plates; said first-named plates bearing directly upon the uppermost of the last-named plates.

2. The combination with a traction-engine and frame of a main axle bearing and traction wheels carried upon the ends thereof, yokes passing over and suspended from the axle, plates to which the ends of said yokes are secured, springs carried upon said plates, supports upon which the engine-frame or boiler rests, said supports including transverse plates standing vertically on edge and separated to receive and form a guide or channel in which the axle is movable, said supports resting upon the uppermost of the first-named plates.

3. The combination with a traction-engine, the frame thereof, of an axle having bearing and traction wheels upon each end, yokes passing over said axles inside of the spindles upon which the wheels are mounted, plates suspended from the lower ends of the yokes, springs supported upon said plates, other plates resting upon the tops of the springs through which plates and springs the yokes pass, parallel bars on edge extending transversely beneath the boiler and frame of the machine, the ends of said bars resting upon the plates carried by the springs, said transverse bars forming a trough or channel within which the axle is vertically movable.

4. The combination with a traction-engine and its frame, of transverse bars forming a channel, a main wheel-axle extending through and movable within said channel and having traction and bearing wheels turnable upon

the outer ends thereof, horizontal plates and springs upon which the channel-irons rest, similar plates upon which the springs rest and yokes passing over the axle having the
5 lugs extending down through the springs and plates and secured to the lowermost plates.

5. The combination with a traction-engine and its frame of an axle upon the ends of which the bearing and traction wheels are carried, a channel-frame extending transversely
10 beneath the boiler and engine-frame which are supported thereon and within which channel the axle is vertically movable, springs and supporting yokes and plates connecting
15 the axle and the boiler-support whereby a vertical yielding movement is effected, pivoted links extending substantially horizontally front and rear from the channel-frame and connecting the axle-supports with the
20 main frame and the boiler in front of and behind the axle.

6. The combination in a traction-engine of a boiler and frame, an axle with bearing and traction wheels at each end, springs suspended below the axle and located intermediate of
25 the axle and the main frame and boiler, whereby a vertical yielding movement is effected, spaced transverse plates forming a vertical guide for the axle, a bar extending across the rear of the boiler, links connecting the ends
30 of the bar with the vertical guide between which the axle moves, other links connecting said guide with the front of the frame.

7. In a traction-engine, a front steering-wheel, a circular ring-frame within which it
35 is journaled, an exterior rigid circular frame connected with the main engine-frame within which the steering-wheel ring is turnable, ver-

tically-journaled rollers interposed between the two rings, frames extending upwardly
40 from the main and from the wheel frame respectively, guide-sleeves carried by said frames substantially central above the wheel, and a spring interposed between said sleeves.

8. A traction-engine steering-wheel, a circular frame to which it is journaled, an exterior circular frame carried by the main engine-frame, vertically-journaled rollers interposed between the rings, vertically-disposed
50 frames extending upwardly from the main and from the wheel frame respectively convergent so as to stand substantially in line above the wheel, a spring interposed between the two frames, a vertical guide-stem extending through the spring from one frame to the
55 other, and a ball-bearing support between the spring and the wheel-frame upon which it is carried.

9. A traction-engine steering-wheel, a circular ring to which it is journaled, an exterior
60 circular ring carried by the main engine-frame, journaled rollers interposed between the rings, vertically-convergent frames carried by the two circular rings, a vertical guide-stem extending between the two, and a surrounding spring, chains connected with the
65 steering-wheel circle, and winding-drums upon the main frame whereby the chains are moved to turn the wheel.

In witness whereof I have hereunto set my
hand.

DANIEL BEST.

Witnesses:

JAMES P. TONNEY,
M. GEISENHOFER.