

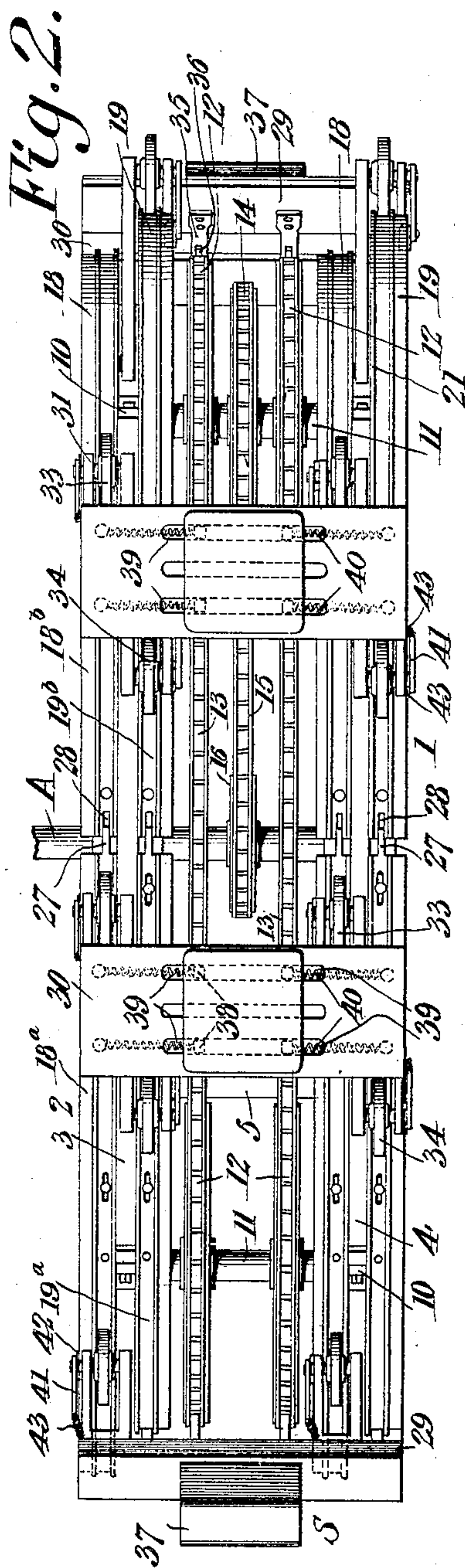
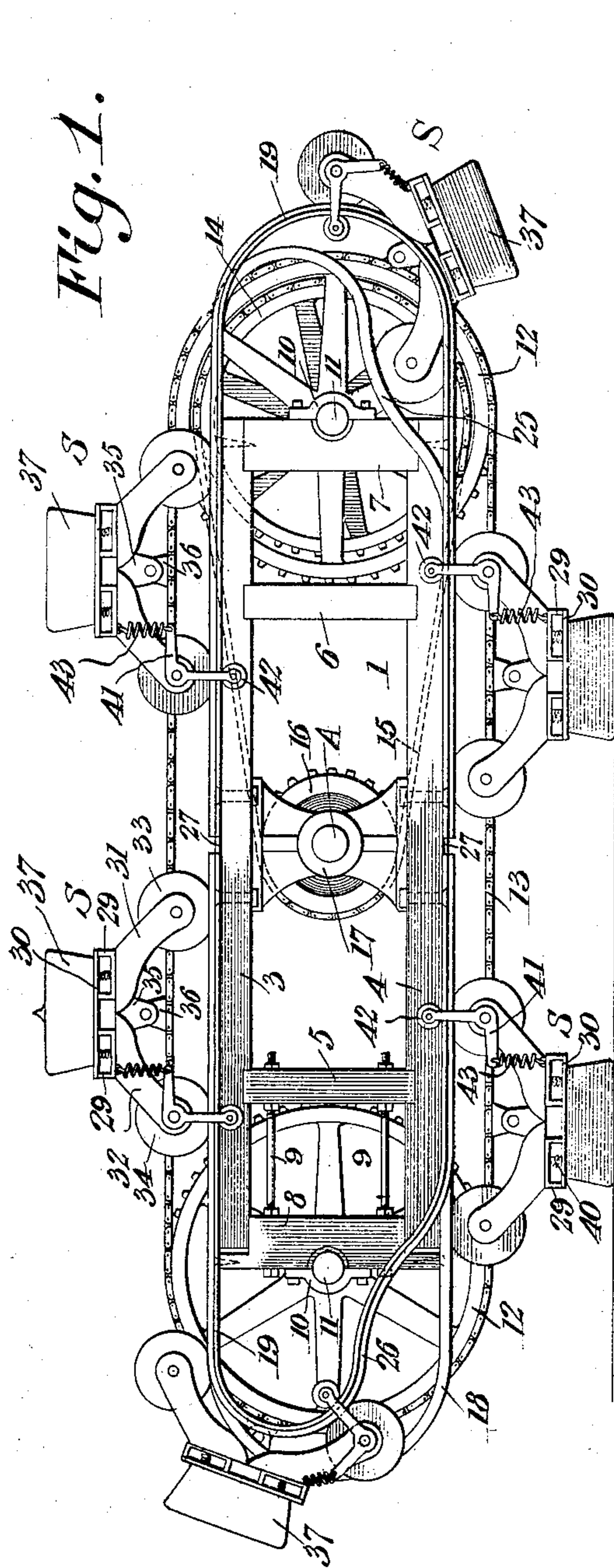
No. 791,199.

PATENTED MAY 30, 1905.

M. W. LEWIS.  
TRACTION ENGINE.

APPLICATION FILED OCT. 7, 1904.

2 SHEETS—SHEET 1.



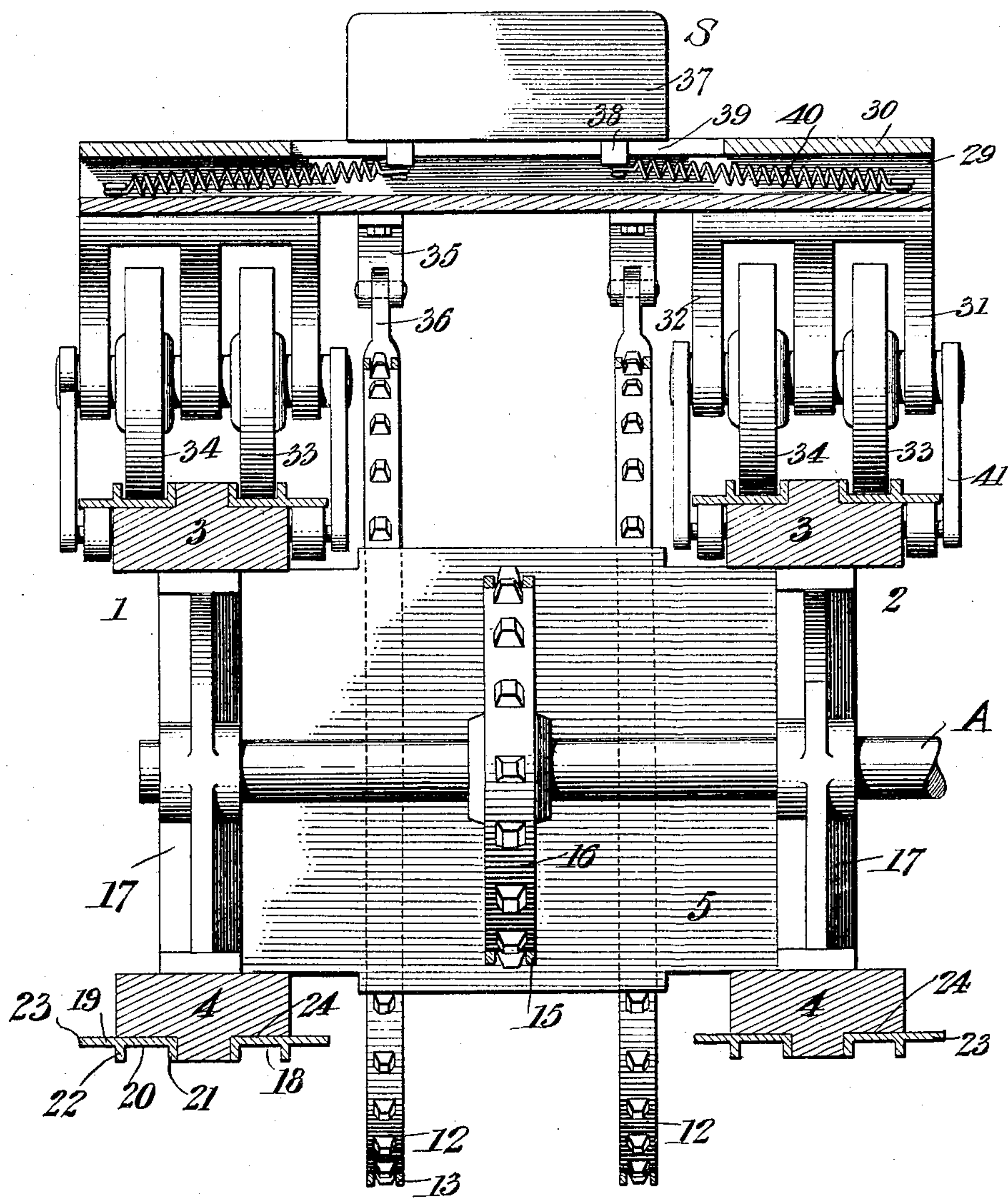
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2 SHEETS—SHEET 2.

Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 791,199, dated May 30, 1905.

Application filed October 7, 1904. Serial No. 227,561.

*To all whom it may concern:*

Be it known that I, MELVIN W. LEWIS, a citizen of the United States, residing at Hillsgrove, in the county of Sullivan and State of Pennsylvania, have invented a new and useful Traction-Engine, of which the following is a specification.

This invention relates to traction-engines or motor-vehicles of that class in which the trucks are provided with driven endless chains having devices connected therewith which by engaging the ground serve to propel the vehicle; and the object of the invention is to simplify and to improve this class of devices.

With these ends in view the invention consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of embodiment of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that the right is reserved to any changes, alterations, and modifications to which recourse may be had within the scope of the invention and without departing from the spirit or sacrificing the efficiency of the same.

In said drawings, Figure 1 is a side elevation showing a truck of a traction-engine constructed in accordance with the principles of the invention. Fig. 2 is a top plan view of the same. Fig. 3 is a transverse sectional view, on a larger scale, of a portion of the truck.

Corresponding parts in the several figures are indicated by similar characters of reference.

A designates an axle of a traction-engine which is mounted for rotation in suitable bearings (not shown) and which is to be driven from a suitable source of power supported upon the body of the vehicle. It is to be understood that the vehicle-body is to be supported upon a plurality of axles, usually two, and that said axles may be driven independently or conjointly in any suitable manner, which has not been illustrated, as it does not

form a part of the present invention. It is also to be understood that each axle will in practice be supported upon two trucks; but inasmuch as the construction of the trucks is identical only a single one has been shown. This truck, then, forms the subject of the invention which is now to be described.

The body of the truck is composed of two vertically-disposed rectangular frames—viz., an outer frame 1 and an inner frame 2. Each of these frames is composed of upper and lower longitudinal beams 3 4, which are connected and spaced apart by means of braces 5 and 6, which are located at a distance from the ends of the longitudinal frame-piece. The latter have also been shown as being connected and spaced apart at their front ends by means of cross-pieces 7, the rear ends of said longitudinal beams being spaced apart by means of slides 8, which are connected adjustably with the braces 5 by means of bolts 9. It is to be understood that the slides may be disposed at the front instead of at the rear ends of the truck-frames.

The cross-pieces 7 and the slides 8 are provided with boxes or bearings 10, in which are journaled shafts 11, each carrying a pair of sprocket-wheels 12, suitably spaced apart, as shown, the sprocket-wheels upon the respective shafts being connected by means of chains 13, which may be tightened and kept perfectly taut by moving the slide 8 in an outward direction, as will be readily understood. In this manner wear upon the chains and sprockets may be compensated for. The shaft 11, which is journaled upon the stationary cross-piece 7, carries an additional sprocket-wheel 14, which is connected, by means of a chain 15, with a sprocket-wheel 16 upon the axle A, which latter has bearings in boxes 17, which are mounted centrally between the longitudinal frame-beams 3 and 4 of the truck-beams, which latter, as will thus be seen, are capable of oscillating freely upon the axle.

Each of the truck-frames 1 and 2 supports a pair of endless tracks which have been designated, respectively, 18 and 19, said tracks being composed of base-plates 20, provided at their inner edges with flanges 21 and at points intermediate their edges with flanges 22, the



outer edges of the base-plates overhanging the frame-beams 3 and 4 at both sides of the latter to form auxiliary tracks 23, the purpose of which will be hereinafter set forth. By preference recesses 24 are formed in the longitudinal frame members 3 and 4 to afford seats for the track members, as will be readily seen in Fig. 3 of the drawings. The front ends of the tracks 19 are curved upon the arc of a circle, as will be seen clearly in Fig. 1, and the front ends of the tracks 18 terminate short of the tracks 19 and are bulged upwardly or cam-shaped upon their under sides, as indicated at 25. The rear ends of the tracks 18 are curved upon the arc of a circle, and the rear ends of the tracks 19 are terminated short of the rear ends of the tracks 18 and are bulged upon their under sides, so as to form cams 26.

Each of the tracks 18 and 19 is composed of two separate members or pieces, (designated, respectively, 18<sup>a</sup> 18<sup>b</sup> and 19<sup>a</sup> 19<sup>b</sup>,) the ends of said track pieces or members meeting each other approximately centrally of the longitudinal frame members 3 and 4 of the truck-frames. The track members 18<sup>a</sup> and 19<sup>a</sup> have been shown as being provided at their ends with tongues 27, adapted to engage recesses 28 in the meeting ends of the track pieces or members 18<sup>b</sup> and 19<sup>b</sup>. By this construction the meeting ends of the track pieces or members will be held securely against transverse movement or spreading. The track members 18<sup>a</sup> and 19<sup>a</sup> are connected rigidly with the slides 8 and are supported slidably with relation to the longitudinal frame members 3 and 4, while the track members 18<sup>b</sup> and 19<sup>b</sup> are firmly secured upon said frame members. By this construction it is evident that when the slides 8 are forced in an outward direction for the purpose of taking up slack in the chains 13 the meeting ends of the track members will not become disconnected, but will afford continuous traveling-surfaces for the wheel-treads of the elements which travel thereon.

Each of the traveling elements or "shoes," as they may be generically termed and which are individually designated by the letter S, is composed of a pair of channel-bars 29, disposed with their grooves faced in an outward direction and connected by plates 30. These channel-bars and plates constitute frames which are provided with front and rear wheel-carrying brackets 31 and 32, the front wheels of which, 33, travel upon the tracks 18, while the rear wheels 34 travel upon the tracks 19. The shoes are provided with inwardly-extending brackets 35, having pivotal connection with lugs 36, carried by the chains 13, and whereby the shoes are maintained upon the tracks in such a manner as to be carried over said tracks by the action of the chains 13, and also in such a manner as to be capable of tilting at the ends of the tracks where the bulged

or cam-shaped portions of said tracks are engaged by one set of wheels. The frame-plates 30 of the shoes carry the ground-engaging sole-pieces or blocks 37, which are provided on their inner sides with lugs 38, extending through transverse slots 39 in the plates 30 and connected, by means of springs 40, with the ends of the channel-bars, thereby maintaining the sole-pieces flexibly in connection with the face-plates 30 in such a manner as to be capable of lateral movement, whereby the said sole-pieces may readily adapt themselves to any inequalities in the surface of the ground.

The axles of the shoes carrying the "rear" wheels 34, whereby is meant the wheels which are rearmost while the shoes are traversing the upper flights of the tracks, constitute fulcrums for bell-crank levers 41, the inwardly-extending arms of which are provided with wheels or rollers 42, traveling upon the inner sides of the track extensions 23. The outer arms of said bell-crank levers are connected with the frames of the shoes by means of springs 43, whereby the wheels or rollers 42 are maintained in contact with the track-surfaces provided therefor, so that said wheels or rollers shall at all times be in contact with said track-surfaces and especially when the frames of the shoes are tilted at the ends of the tracks in passing from the upper to the lower flights of said tracks, and vice versa. It will be seen that at the ends of the tracks, owing to the bulged or cam-shaped portions of the latter, the ground-engaging blocks or sole-pieces will not be abruptly tilted, but will be gradually turned to present their ground-engaging faces in an approximately horizontal position when approaching the surface of the ground at the front ends of the trucks and likewise to raise them with their ground-engaging faces in an approximately level or horizontal position from contact with the ground at the rear ends of the trucks.

From the foregoing description, taken in connection with the drawings, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains. It is obvious that the frames of the trucks will be readily balanced upon the axis of the vehicle to which the improved trucks are applied. Each of the trucks may be equipped with any desired number of traveling elements or shoes, although it is desirable that a sufficient number be used to enable not less than two to be presented in contact with the ground at any one time. In the accompanying drawings a truck has been shown as being equipped with six shoes, which will probably be the preferred number. It is obvious that power applied to the axle will be transmitted to the endless chains carrying the shoes, which will thus be caused to travel continuously over the endless tracks, impinging upon the ground and serving to carry the vehicle forward.



Having thus described the invention, what is claimed is—

1. An axle, a truck-frame pivotally engaging said axle, endless tracks supported upon said truck-frame, said tracks being composed each of two pieces or members having their meeting ends provided with interengaging tongues and recesses, suitably supported and driven endless carrying members, shoes connected with said carrying members and thereby maintained upon the tracks, and means for taking up slack in the endless carrying members and for simultaneously expanding the tracks to maintain the proper distance between the latter and the carrying members.

2. A truck-frame, a slidable member forming a part of said frame, a shaft journaled in the truck-frame, a shaft journaled upon the slidable member, sprockets upon said shafts, endless chains connecting said sprockets, endless tracks comprising members connected rigidly with the truck-frame and members connected rigidly with the sliding part of said truck-frame and having slidable connection with the latter, and traveling members or shoes connected with the endless chains and thereby maintained upon the tracks.

3. A truck-frame having endless tracks with segmentally-rounded front ends, and auxiliary endless tracks having their front ends bulged to form cams.

4. A truck-frame having endless tracks with segmentally-rounded front ends and having their rear ends bulged to form cams upon their under sides.

5. A truck-frame having endless tracks having their front ends bulged upon their under sides to form cams, and with segmentally-rounded rear ends.

6. A truck-frame having two sets of endless tracks, one set having segmentally-rounded front ends and bulged cam-shaped rear ends and the other set having bulged cam-shaped front ends and segmentally-rounded rear ends.

7. A truck-frame having two sets of tracks, each set being provided with cam-shaped portions; suitably supported and driven endless carrying members; and shoes connected with the endless carrying members and provided with sets of wheels engaging the sets of tracks.

8. A truck-frame having endless tracks provided with cam-shaped portions, in combination with endless driven carrying members, and shoes having pivotal connection with said carrying members and provided with track-engaging wheels and with ground-engaging blocks or sole-pieces.

9. A truck-frame having endless tracks provided with lateral extensions, endless driven carrying members, shoes connected with said carrying members and having track-engaging

wheels, bell-crank levers connected with the shoes, auxiliary wheels connected with the inner ends of the bell-crank levers and engaging the inner sides of the lateral track extensions, and spring means engaging the bell-crank levers and operating to hold the auxiliary wheels in engagement with said track extensions.

10. A truck-frame having endless tracks provided with lateral extensions, endless driven carrying members, shoes connected with said carrying members and having track-engaging wheels, and auxiliary flexibly-supported wheels connected with the shoes and engaging the inner sides of the lateral track extensions.

11. A truck-frame having endless tracks provided with cam-shaped portions and with lateral extensions, in combination with endless driven carrying members, and shoes connected with said carrying members and thereby maintained upon the tracks; said shoes having track-engaging wheels and auxiliary spring-supported wheels engaging the inner sides of the lateral track extensions.

12. A truck-frame having endless tracks provided with lateral extensions, endless driven carrying members, shoes connected with said carrying members and having track-engaging wheels, bell-crank levers connected with said shoes, wheels journaled upon the inner arms of said bell-cranks and engaging the inner sides of the lateral track extensions, and springs connecting the outer arms of the bell-cranks with the shoe-frames.

13. In a device of the class described, the combination with a truck-frame having endless tracks and endless carrying members, of shoes connected with said carrying members and having track-engaging wheels, said shoes being provided with channel-plates, slotted plates connecting said channel-plates, blocks or sole-pieces having lugs extending through the slotted plates into the channel-plates, and springs disposed in the latter and connected with the lugs of the sole-pieces.

14. In a device of the class described, a traveling member or shoe including a channeled frame, a slotted body-plate, a ground-engaging sole-piece having lugs extending through the slots in the body-plate, and springs mounted in the channels of the frame and connected with said lugs to maintain the sole-piece flexibly in position.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MELVIN W. LEWIS.

Witnesses:

ROBERT BRONG,  
ANDREW GALOUGH.