

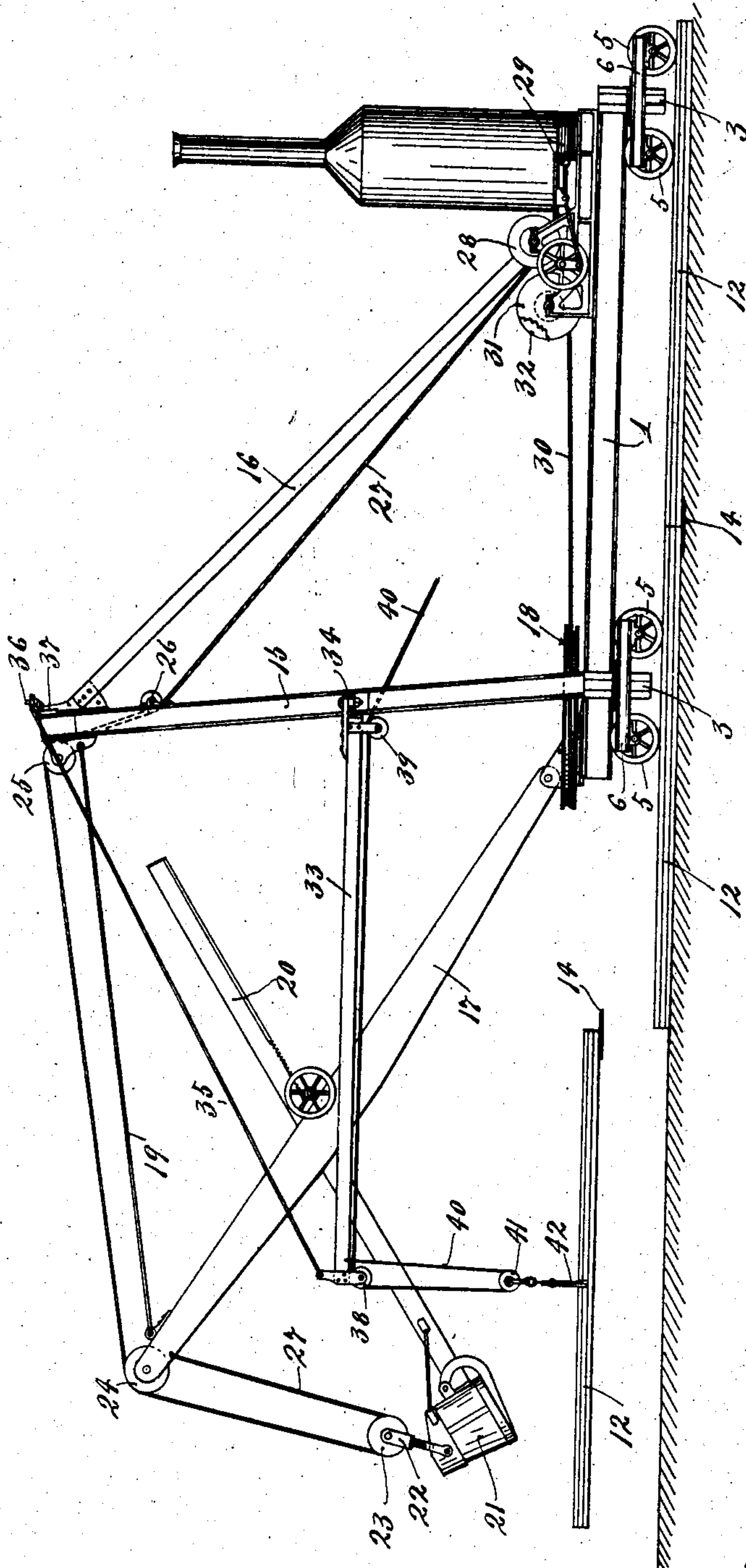
No. 835,029.

PATENTED NOV. 6, 1906.

L. MAYER.  
EXCAVATING APPARATUS.  
APPLICATION FILED MAR. 7, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.  
A. H. Opsahl.  
S. W. J. J. J.

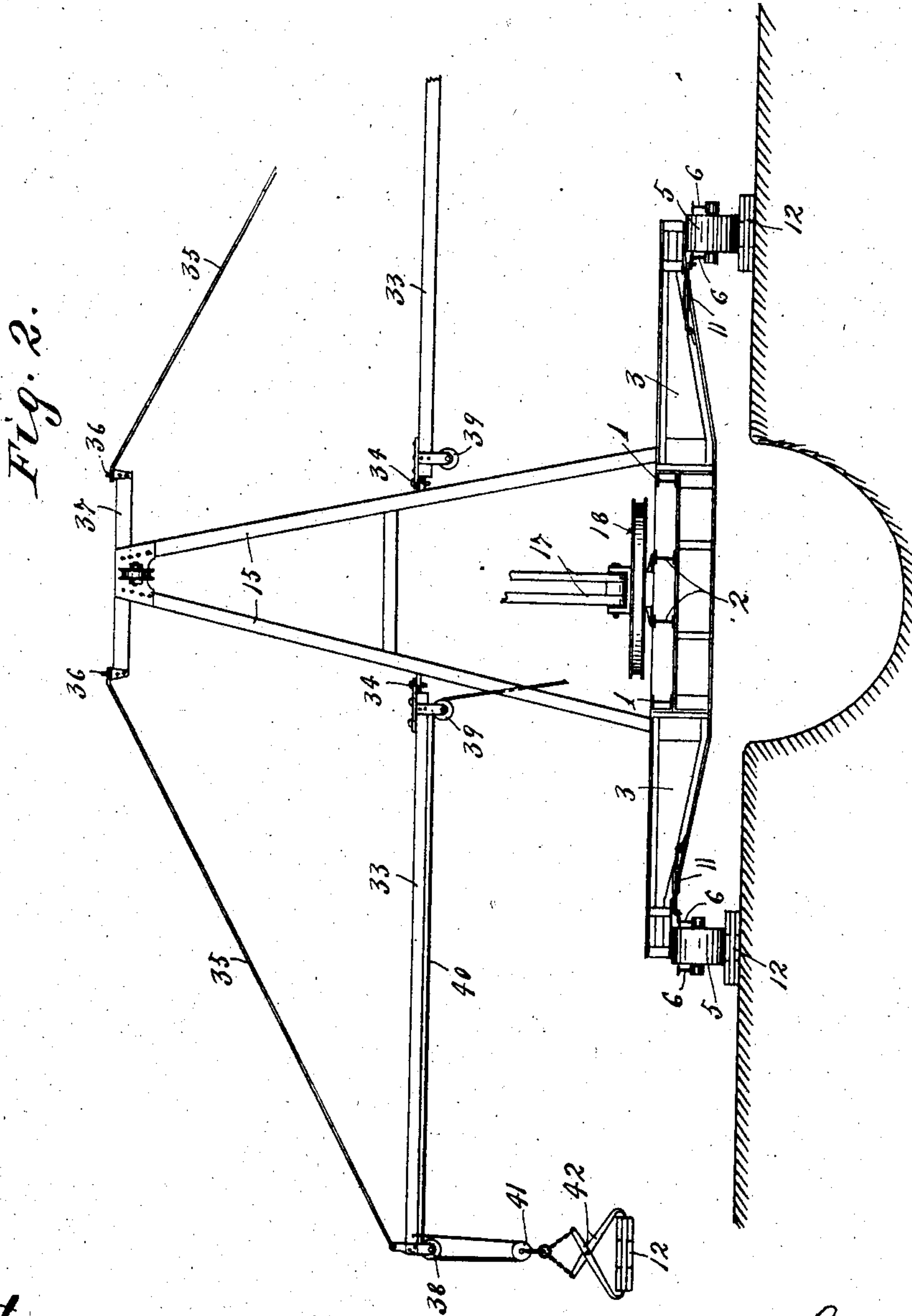
Inventor.  
Louis Mayer.  
By his Attorneys,  
Williamson Merchand

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3 SHEETS—SHEET 2.



Witnesses.  
A. H. Opsahl.  
E. W. Juppman.

Inventor  
Louis Mayer.  
By his Attorneys.  
William M. Merchant

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3 SHEETS—SHEET 3.

Fig. 3.

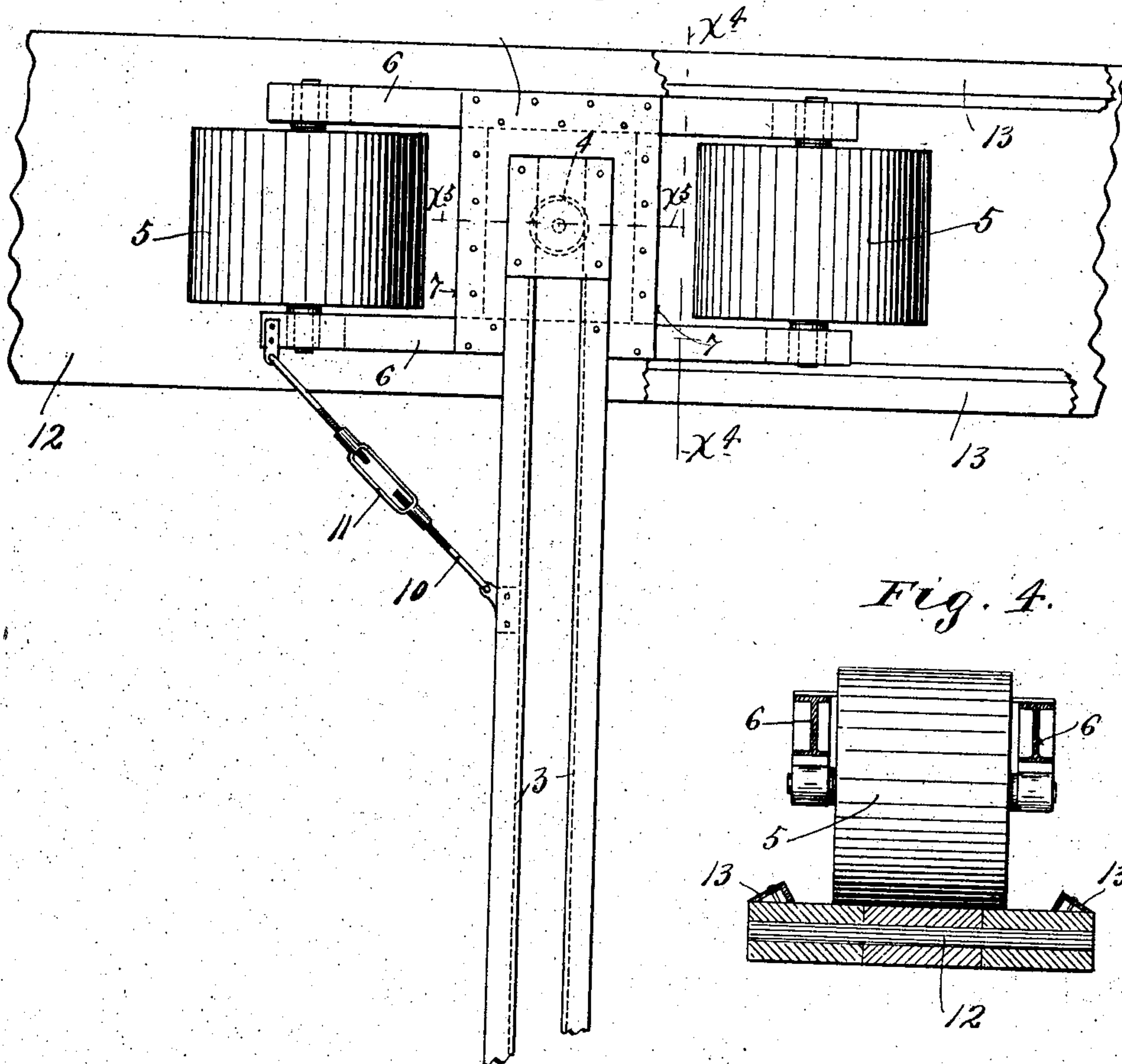


Fig. 4.

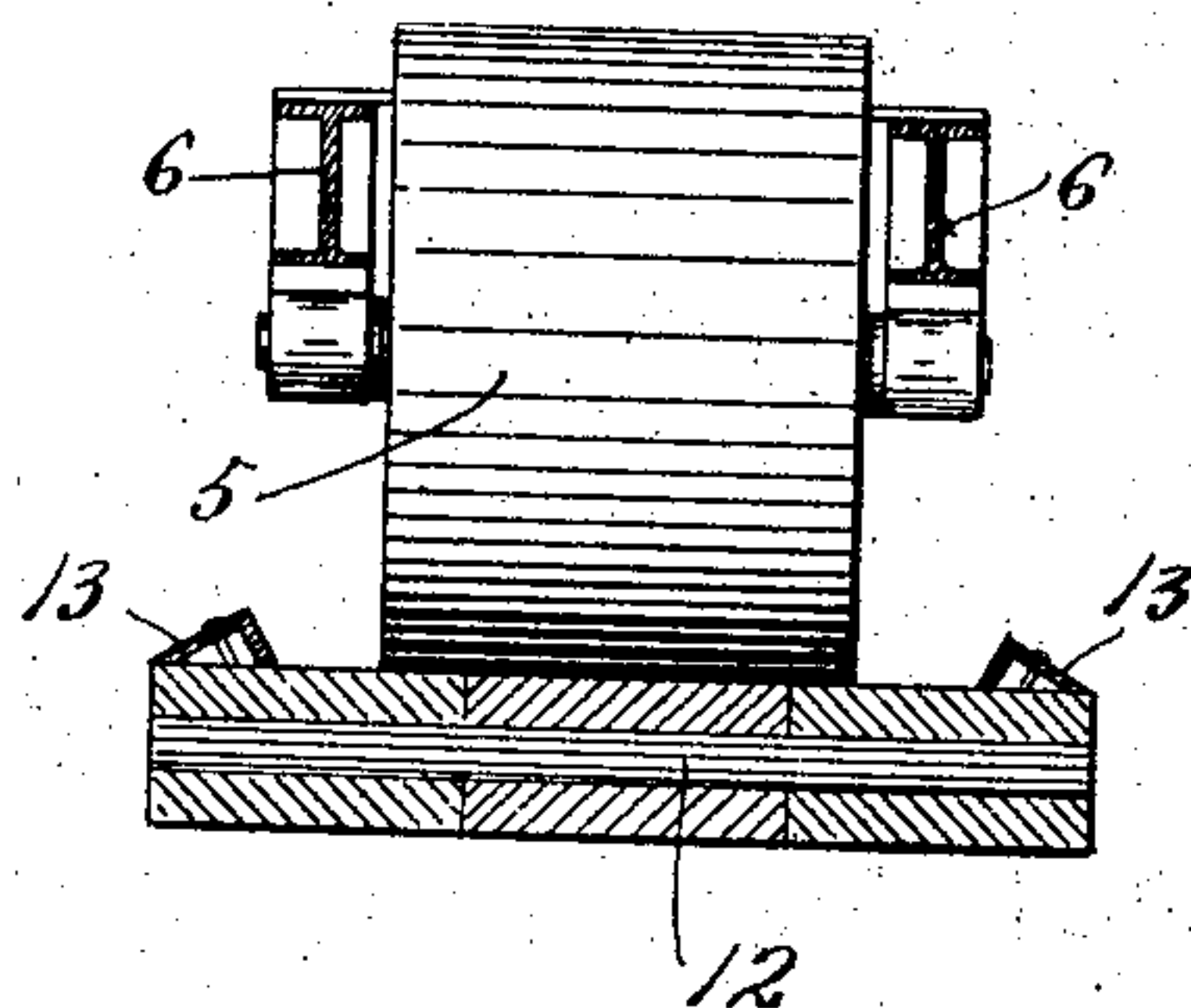
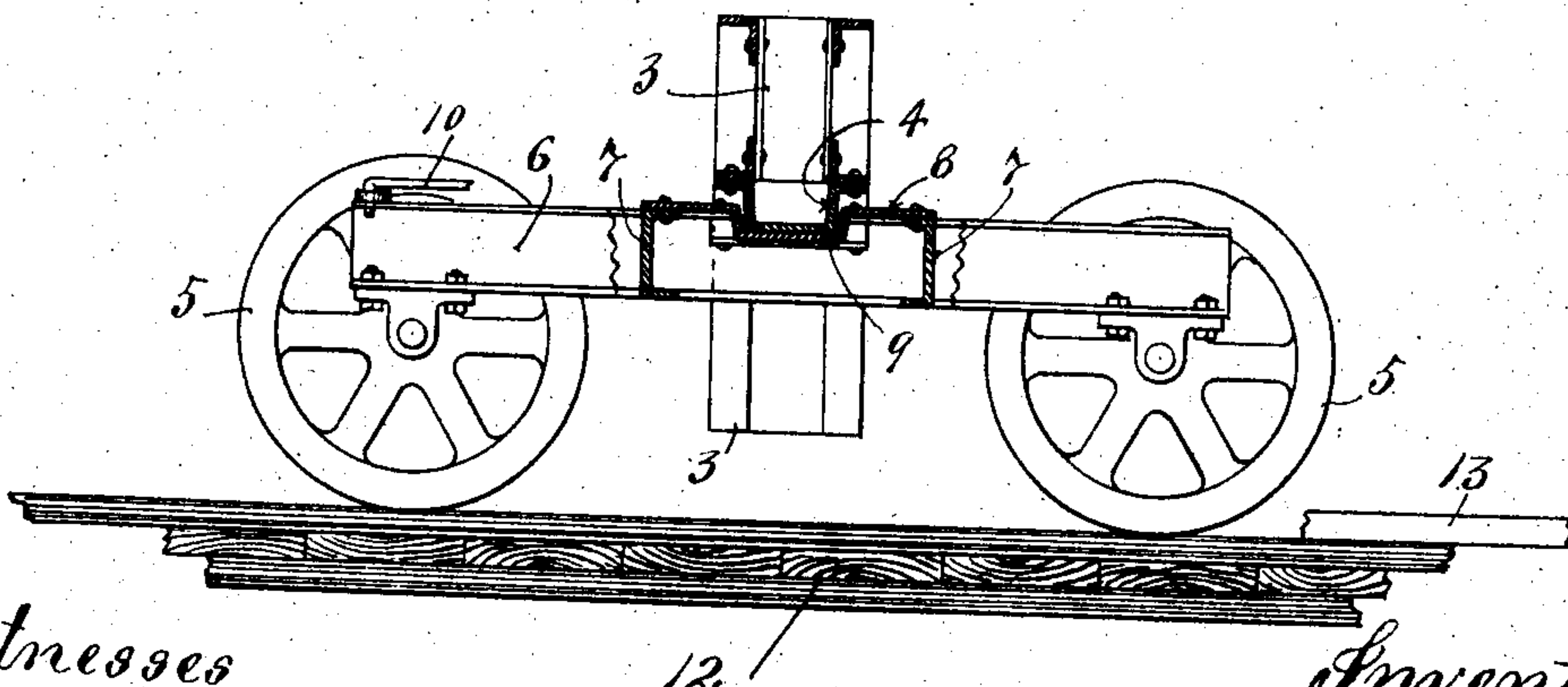


Fig. 5.



Witnesses  
A. H. Opsahl.  
E. W. J. J. J.

Inventor  
Louis Mayer.  
By his Attorneys  
Williamson & Muchant



# UNITED STATES PATENT OFFICE.

LOUIS MAYER, OF MANKATO, MINNESOTA.

## EXCAVATING APPARATUS.

No. 835,029.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed March 7, 1906. Serial No. 304,678.

*To all whom it may concern:*

Be it known that I, LOUIS MAYER, a citizen of the United States, residing at Mankato, in the county of Blue Earth and State of Minnesota, have invented certain new and useful Improvements in Excavating Apparatus; 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 appertains to make and use the same.

My present invention relates to excavating apparatus, and especially that class thereof generally designated as "steam-shovels," and has for its object to improve the same in the several particulars hereinafter noted.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

My improved excavating apparatus is designed to run over a portable track that is made up of sections and is adapted to be laid just ahead of the excavator, thereby making the travel of the excavator an easy matter and making it possible to run the same over soft and boggy ground.

Certain features of this invention relate particularly to improved arrangement of cranes, whereby the track-sections may be picked up from the rear of the excavator and laid in front thereof either while the dipper-operating mechanism is in action or while the same is idle.

Other features of the invention relate to a novel manner of independently mounting the several trucks of the excavator-car, whereby the proper movements of the car over the portable track may be readily controlled.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation with some parts broken away, showing the improved excavator. Fig. 2 is a front elevation of the excavator, some parts being broken away. Fig. 3 is a plan view on an enlarged scale, showing one of the car-trucks, a portion of the car-frame, and a portion of one of the track-sections, some parts being broken away. Fig. 4 is a section taken on the line  $x^4 x^4$  of Fig. 3; and Fig. 5 is a side elevation of one of the car-

trucks and a portion of the car-frame, some parts being sectioned on the line  $x^5 x^5$  of Fig. 3.

All parts of the excavator are carried directly or indirectly by a car or portable support, the body-frame of which, as shown, is made up of a plurality of longitudinally-extended beams 1 and 2 and a pair of heavy transversely-extended trussed beams 3, that rigidly tie together the said beams 1 and 2. The beams 1 and 2, as shown, are spaced apart at the intermediate portions of the transverse beams 3 and are rigidly bolted or otherwise rigidly secured thereto, with the ends of said transverse beams extending far beyond the outer beams 1. The tie-beams 3 are preferably made long enough to span or straddle a quite wide ditch. Rigidly secured to the under surface of each end of each transverse tie-beam 3 is a heavy thimble-like truck center bearing 4.

The car frame or body is supported by four two-wheeled trucks, each having a pair of wide-faced wheels 5, mounted in a frame made up chiefly of parallel metal beams 6, that are tied together at their central portions by transverse beams 7 and a center bearing-plate 8. Each center bearing-plate 8 is provided with a depression or seat 9, that receives one of the thimble-like center bearings 4, already noted. These four trucks are pivotally connected, one to each end of the two long transverse tie-beams 3. These four trucks are capable of independent pivotal movements in horizontal plane, and means is provided for setting the same at any desired angle with respect to the transverse beams 3. The devices for accomplishing these adjustments are preferably each made up of a pair of rods 10 and a connecting-turnbuckle 11, which turnbuckle engages the two rod-sections connected thereby by right and left hand threads, so that the link made up of three ties may be lengthened out and shortened at will. One of these extensible links connects the forward portion of each truck-frame to the adjacent transverse beam 3, as best shown in Fig. 3. In Fig. 3 the truck-frame is adjusted at a right angle to the beam 3, or, in other words, the axes of the two wheels 5 are adjusted parallel to the said beam. When all of the trucks are adjusted, as shown in Fig. 3, the car will of course travel straight ahead or on a straight line; but by shortening up the four adjust-



able links or by lengthening the same the trucks may be adjusted at an angle to the beams 3 and may thus be caused to travel on curved lines.

5 The loose pivotal connection between the trucks and the transverse beams of the car-body permits all of the wheels 5 of the several trucks always to engage with the track or road over which they travel regardless of  
10 irregularities therein and without putting unnecessary strains upon the framework of the car.

The car is preferably made to run upon a portable track, which track is made up of  
15 wide flat rails 12, preferably made of planks bolted, nailed, or otherwise rigidly secured together and having on their upper faces near their edges metallic cleats 13. The cleats 13 are spaced apart considerable distance farther than the distance across the  
20 face of the wheels 5. The rail-sections 12 are preferably provided at one end with projecting joint-plates 14, that are adapted to underlie the opposing ends of abutting rail-sections.  
25

The dipper or scoop operating mechanism employed in this device may be of the usual or any suitable construction and, as shown, involves as follows: The numeral 15 indicates  
30 an upright, usually designated as an "A-frame," the same being rigidly secured at its lower end to the front transverse beam 3. An inclined stay-beam 16 rigidly connects the upper end of the A-frame 15 to the rear portion of the car-body frame. A derrick-boom  
35 17 is pivotally attached at its lower end to a swinging table 18, mounted in the forward portion of the car-body frame. The free end of the boom 17 is supported from the upper end of the A-frame 15 by a rod 19,  
40 which permits said boom to swing sidewise under oscillatory movements of the table 18. The "dipper-stick" 20 is mounted for endwise and pivotal movements on the boom 17 in the usual way, and at its other end is  
45 provided with the customary dipper 21. A yoke 22, pivoted to the dipper 21, is provided with a sheave 23. On the free end of the boom 17 is a guide-sheave 24, and on the  
50 upper portion of the A-frame 15 are guide-sheaves 25 and 26. A cable 27 is attached to the free end of the boom 17 and runs under the guide-sheave 23, over the guide-sheaves 24 and 25, and under the guide-sheave 26.  
55 This cable 27 serves to lift the dipper 21 in the usual way, and it is arranged to be wound upon a windlass-drum 28, which is driven in the usual way from the engine 29, mounted on the body-frame of the car. A cable 30 is  
60 attached at its intermediate portion to the swinging table 18. The ends of this cable 30 are adapted to be wound upon drums 31 and 32, which drums may also be driven from the engine 29 in the usual way.

65 To effect rapid handling of the rail-sections

12 in taking up the track at the rear and lowering the same down to the front of the excavating device, I provide a pair of cranes and apply the same, one to each side of the  
70 A-frame or upright 15 of the dipper-operating derrick. The beams 33 of these cranes are pivoted at 34 to the sides of the A-frame 15 and their other ends are connected by rods 35, pivoted to lugs 36, secured on its upper  
75 end to a transverse bar 37, which in turn is rigidly secured to the extreme upper end of the said A-frame 15. A guide-sheave 38 is mounted at the free end of each beam 33, and another guide-sheave 39 is mounted at the  
80 inner end of each of said beams. Attached to the free end of each beam 33 is a cable 40, which supports a floating sheave 41, is thence passed upward and over the guide-sheaves 38, and thence over the guide-sheave 39 to the engine 29. The floating  
85 sheaves 41 support grapple-tongs 42. By means of these two laterally-swinging cranes and the grapple-forks 42 the rail-sections 12 may be rapidly and easily lifted from the rear of the car and deposited in proper line  
90 in front or ahead of the car, and this may be done either while the dipper-actuating mechanism is in operation or while the same is idle.

Fig. 2 illustrates the manner in which the  
95 trucks on the opposite side of the car may be made to straddle a ditch which is being dug.

The device described will dig ditches through swampy ground or any other kind  
100 of ground and deposit the uplifted earth in banks or levees on opposite sides of the ditch and at a considerable distance from the ditch.

The apparatus can be moved forward in a  
105 great many different ways. One way which I find convenient is to attach a cable to a fixed object ahead of the machine and to wind the cable around one of the engine-driven drums carried by the car.  
110

The term "excavating apparatus" is herein used in a broad sense to include steam-shovels, dredges, ditchers, and all analogous devices.

What I claim is—

115 1. An excavating apparatus comprising a car having four trucks pivotally connected to the truck-frame on opposite sides thereof, and dipper or scoop actuating mechanism mounted on said car, substantially as described.  
120

2. An excavating apparatus comprising a car having trucks pivotally connected thereto, and means for setting said trucks at different angles with respect to the frame or body  
125 of said car, substantially as described.

3. In an excavating apparatus, the combination with a car frame or body having long transversely-extended beams adapted to span a ditch, and trucks pivotally con-  
130



connected to the projecting ends of the said transversely-extended beams, substantially as described.

4. In an excavating apparatus, the combination with a car body or frame having long transversely-extended beams adapted to span a ditch, trucks pivotally connected to the outer ends of said transversely-extended beams, and longitudinally-adjustable links connecting the frames of said trucks to

said transversely-extended beams and adapted to set the former at any desired angle with respect to the latter, substantially as described.

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

LOUIS MAYER.

Witnesses:

ELIZABETH SCHMIDT,  
H. F. LEONARD.