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PATENTED JAN. 17, 1905.

W. A. HEUSNER, D. E. GRAVES & C. H. DUDLEY.

EARTH HANDLING MACHINE.

APPLICATION FILED AUG. 1, 1904.

3 SHEETS—SHEET 1.

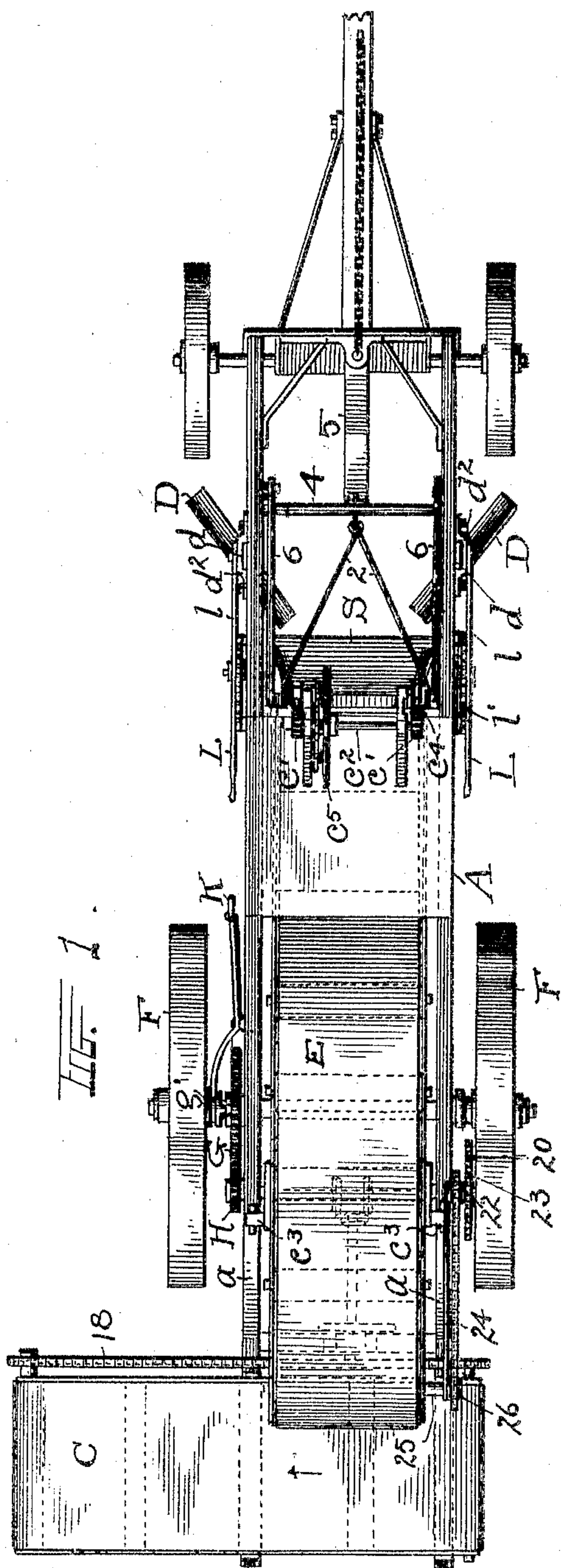
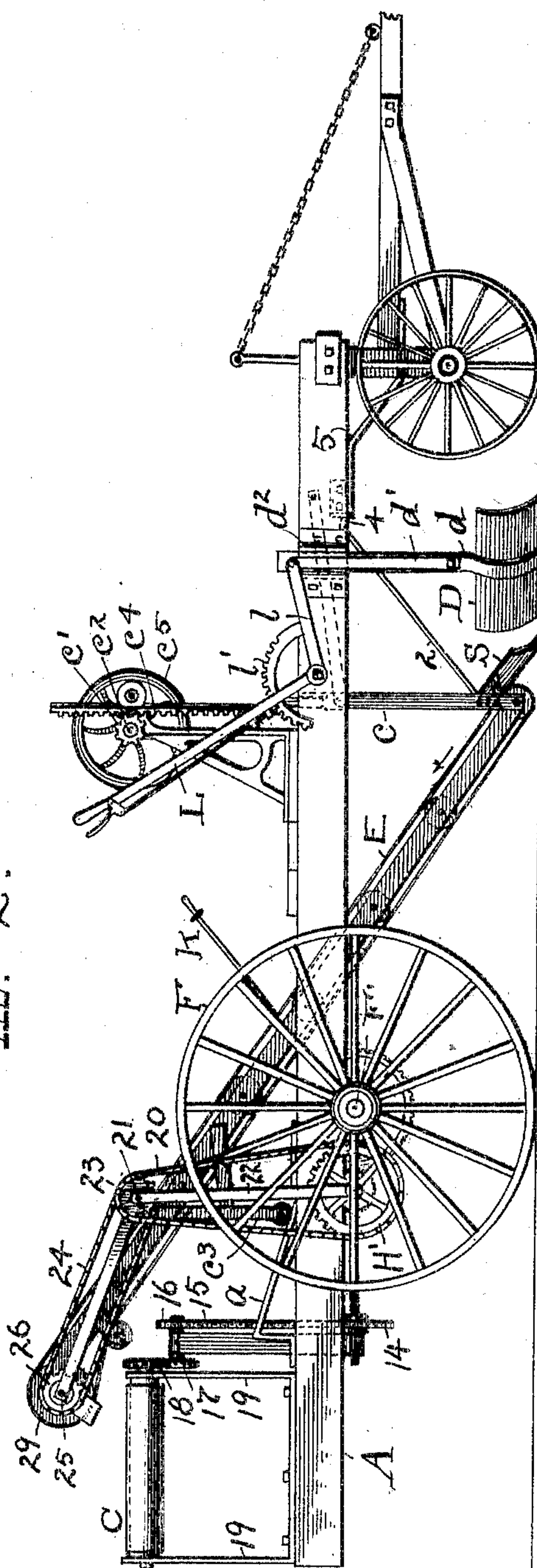


Fig. 1.

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Fig. 2.



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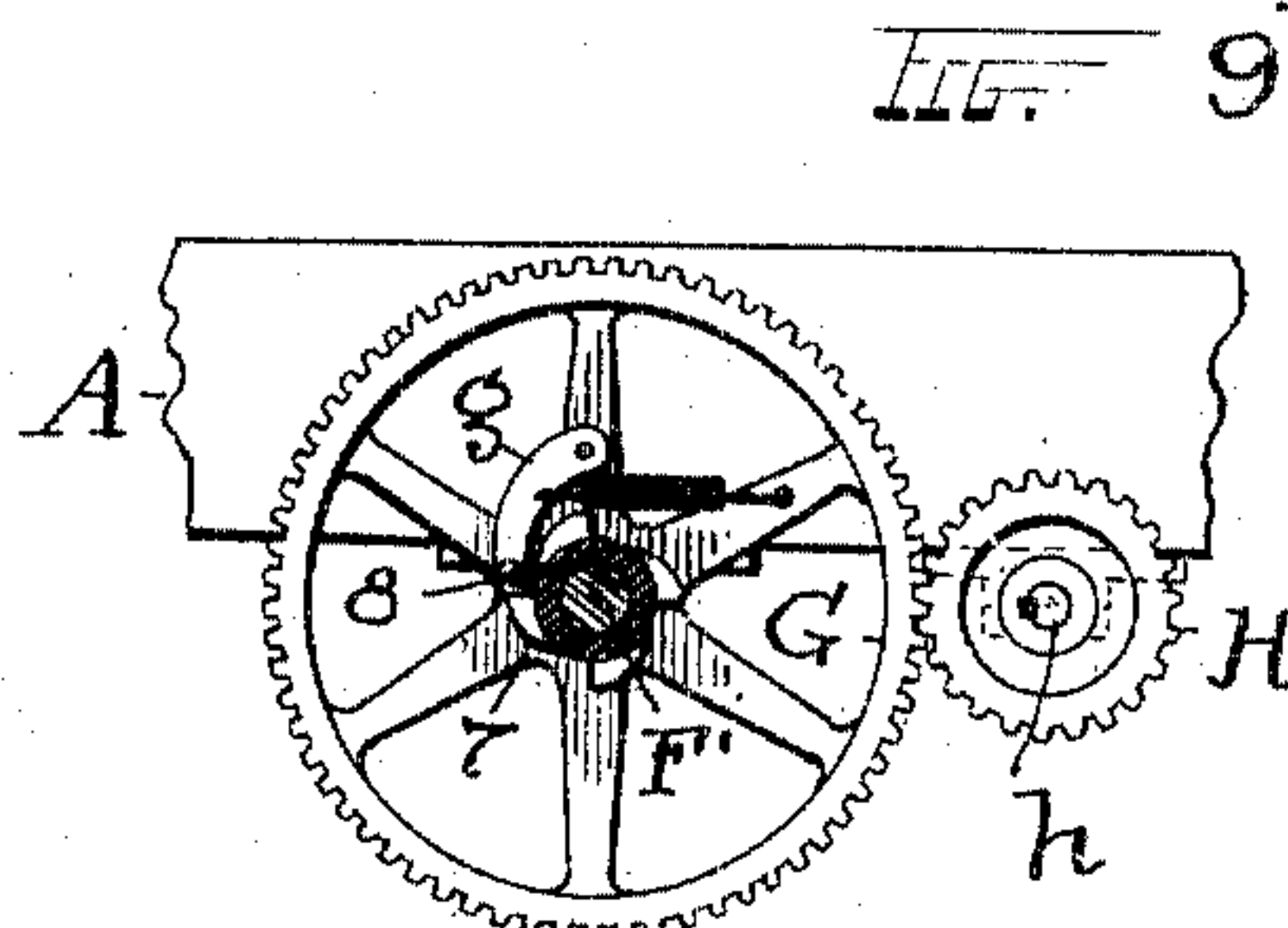
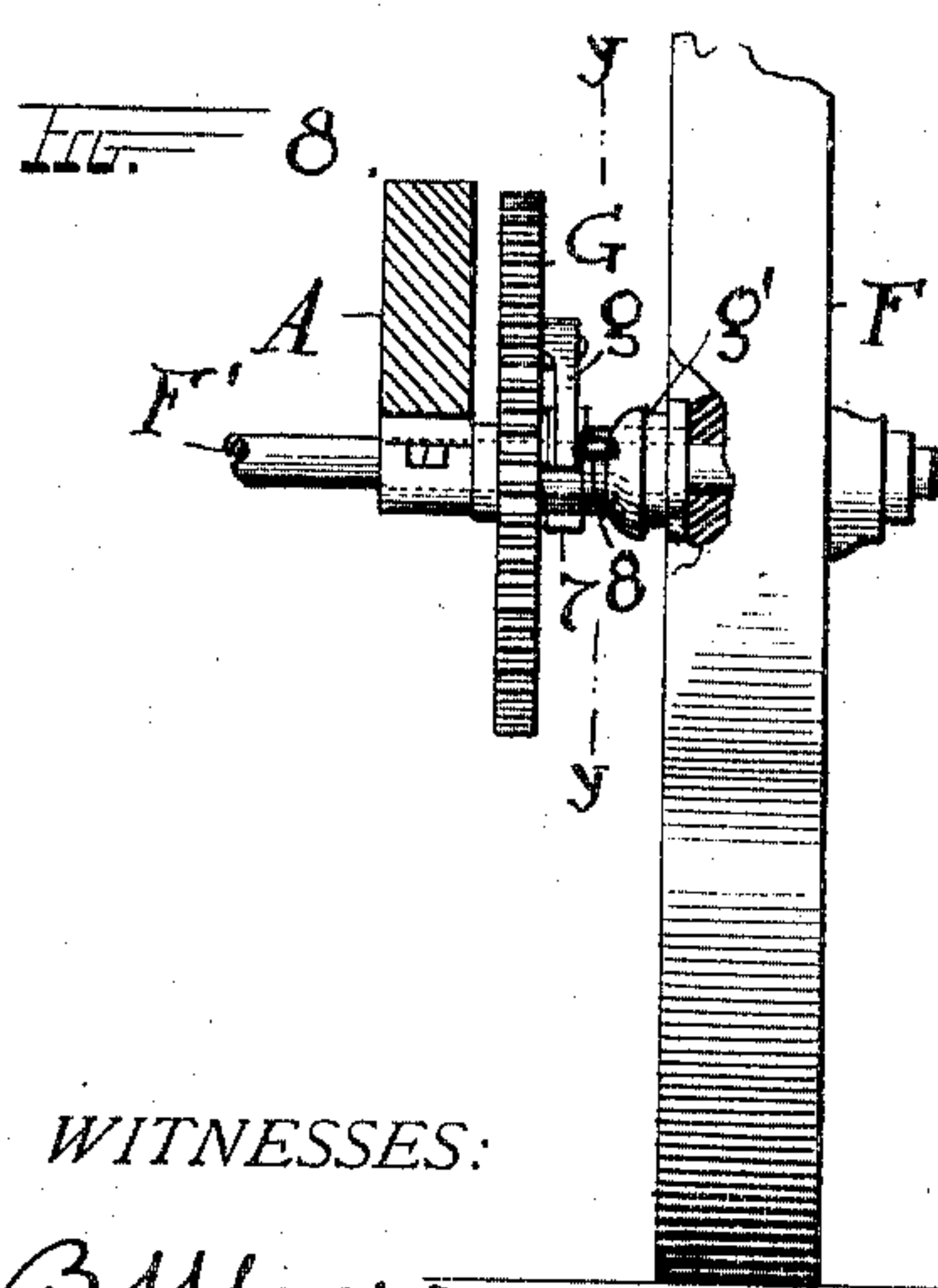
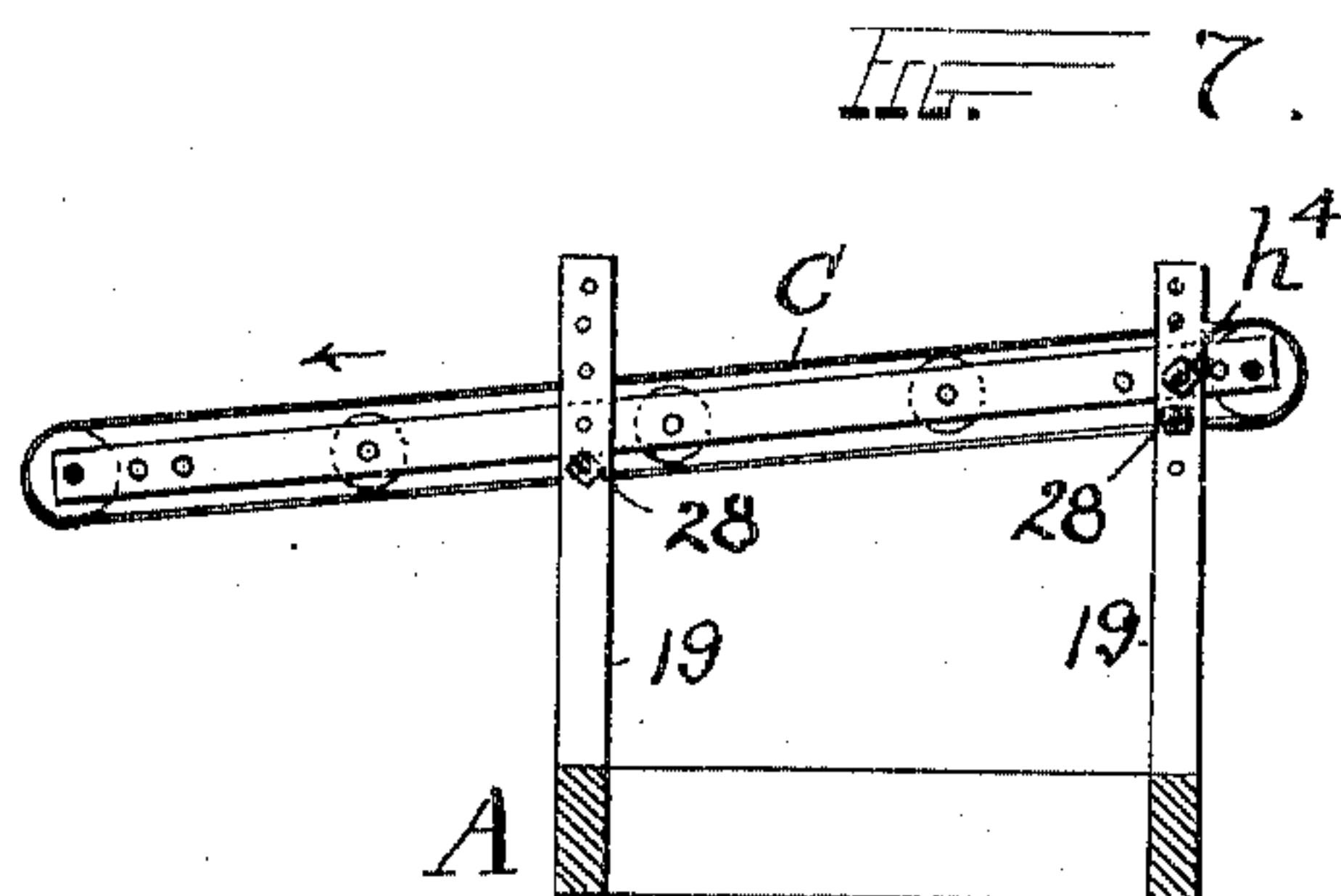
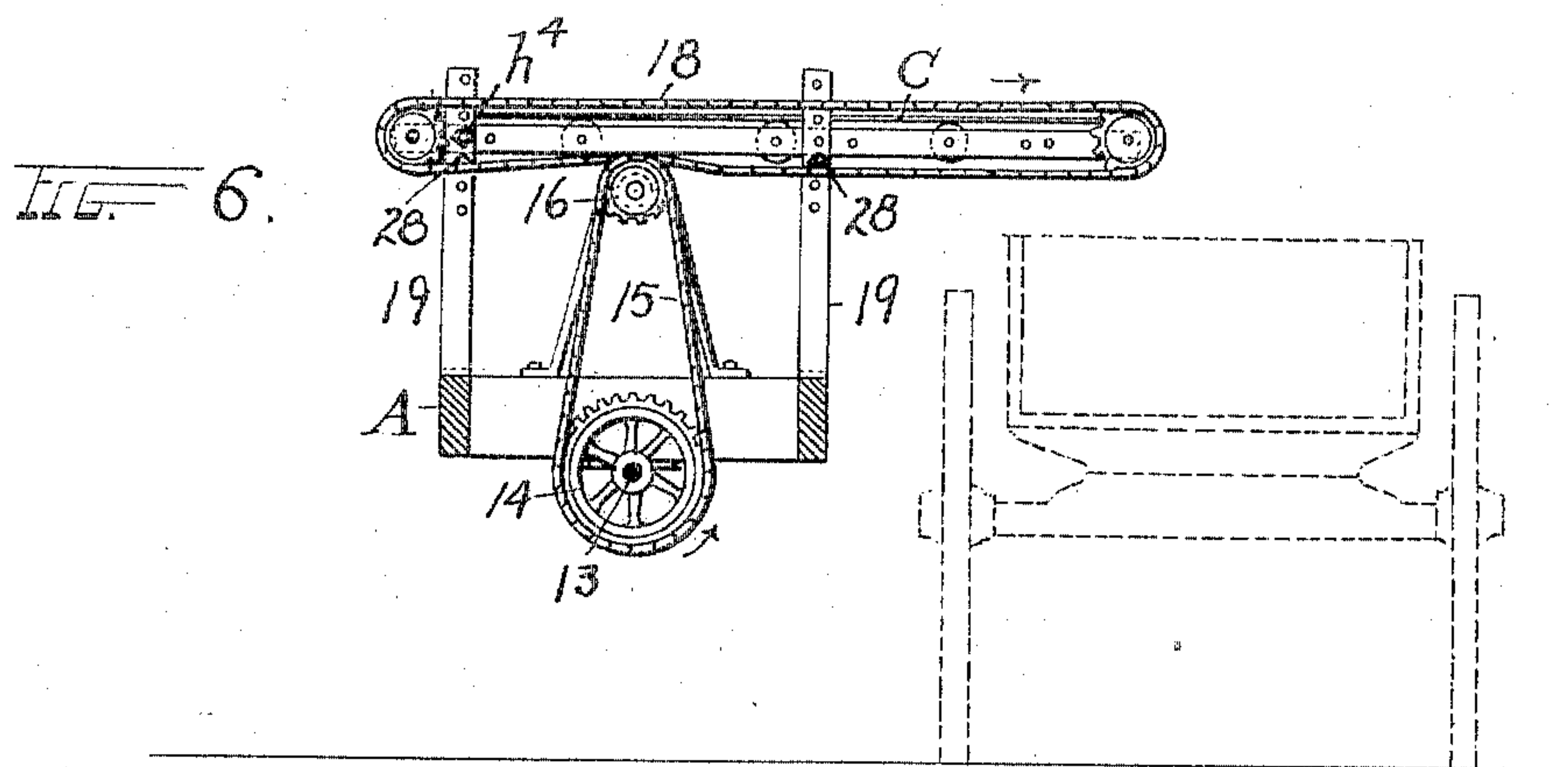
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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EARTH-HANDLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 780,034, dated January 17, 1905.

Application filed August 1, 1904. Serial No. 218,984.

To all whom it may concern:

Be it known that we, WILLIAM A. HEUSNER, DAVID E. GRAVES, and CARL H. DUDLEY, citizens of the United States, residing at Oberlin, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Earth-Handling Machines; and we do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an earth-handling machine, the same being of the vehicle type and adapted to be drawn here and there where work is to be done and to raise loose earth in its path and deliver it at the rear and side of the vehicle, all substantially as shown and described, and particularly pointed out in the claims.

Figure 1 is a plan view of the invention, and Fig. 2 is a side elevation thereof. Fig. 3 is a plan view, partly in section, horizontally of the power-transmitting mechanism geared up with the rear wheels or axle; and Fig. 4 is a front elevation of the scoop and parts immediately associated therewith for raising and lowering the same. Fig. 5 is a longitudinal sectional elevation of the apparatus or machine in its entirety. Fig. 6 is a rear elevation, partly in section, of the immediate wagon-loading mechanism; and Fig. 7 is a partial view of the said mechanism with the conveyer in an opposite and inclined position, as herein-after more fully described. Fig. 8 is an elevation of the rear-axle-drive mechanism, and Fig. 9 is a side sectional elevation thereof.

The machine or apparatus thus shown is designed especially for road-making and the like where earth has been plowed up and is to be carried away and which has heretofore been loaded into wagons by hand. To this end the machine has means for mechanically scooping up the earth and delivering the same at either side at the rear of the machine into a wagon or to unload it here or there, as may be desired, the idea being to handle the earth mechanically and in bulk rather than with shovels, as heretofore, thus making the machine essentially a labor and time saving improvement and doing a given amount of work

at greatly-reduced cost as compared with hand labor.

To these ends the invention consists in a vehicle having four wheels, as here shown, and a main frame A thereon adapted to be drawn here and there by horses or a traction-engine and upon which is supported an inclined elevator E, with a scoop or scraper S at its front and bottom and a transverse conveyer C at its rear adapted to receive and deliver or carry the earth to one side or the other of the machine, as may be found most convenient. Both elevator and conveyer are alike operated by power from the rear axle of the machine, as will be seen.

The elevator E, or the frame carrying the same, is adapted to be raised and lowered at its front or lower end by means of a yoke or bail *c*, pivotally connected with said elevator, and rack-bars *c'* are pivoted on this bail and engaged by pinions *c''* on hand-controlled shaft *c''*, supported from the main frame A on suitable standards, whereby the front of elevator E is adapted to be held at any desired elevation higher or lower according to the work to be done or to be raised up out of use, as in dotted lines, Fig. 5. When the elevator E is raised or lowered at its front, it must have a compensating movement at its rear, which is provided for in this instance by braced supporting standards or posts *c''*, rigid therewith and having rollers or wheels at their bottom adapted to mount on inclines *a* upon the rear of frame A. The said inclines are calculated to keep the rear of the elevator and the mechanism thereon relatively at its normal elevation in respect to frame A and conveyer C, and especially as to conveyer C, whether elevator E be at a higher or lower level at its front. If the elevator E be raised at front, it will ride up on the inclines *a* at the rear correspondingly, because it has no other supports on frame A than these inclines and bail *c* at the front, and the lift at the front is substantially in vertical lines with a rearward throw, as seen in dotted lines, Fig. 5.

The scoop or scraper S at the front of elevator E, which gathers up the earth and delivers it upon the elevator, is fixed upon the bail *c*, which supports the elevator at its front

and has the same width relatively as the elevator itself or something more, and the said bail is engaged at its lower ends by the forked draft rod or rods 2, which converge and are
 5 connected at their upper forward portion centrally upon cross-bar 4 on frame A. This bar has as direct a front connection through link 5 as practicable with the draft, so as to deliver the draft by direct connections to the
 10 said standards and scoop. Brace rods or bars 6 unite with the bail *c* at the upper portion and with the frame A at their front ends, so that as the elevator and scoop are raised through bail *c* the parts, respectively, will ac-
 15 commodate themselves to positions, say, as seen in dotted lines, Fig. 5 and in which the scoop is raised above contact with the ground and the vehicle is free to be moved backward or forward upon its wheels like any other ve-
 20 hicle. The bail *c* is controlled by rack-bars *c*⁴ through hand-wheel *c*⁵ on shaft *c*².

In connection with scoop S we employ what are herein described as "drift-blades" D, supported upon vertically movable and ad-
 25 justable standards *d* in keepers *d*² and running at an outward inclination from the scoop S, so as to enlarge the side reach and convey the earth inward toward the scoop, and by these means we are enabled to materially
 30 widen the scope or reach of the parts, because these drift-blades are spread at their front and convey the earth they gather inward and deliver it in front of the scoop. Lever L, having crank connection *l* with the pivot-
 35 links *d*¹ on standards *d*, is adapted to engage segment *l*¹ by a suitable pawl and serves for raising and lowering said drift-blades more or less, as may be desired. In some instances it may be found convenient to use only one
 40 of these blades, and either may be used alone or both together, and they can be set at any preferred depth, and their standards are strong enough to take any back pressure coming upon them. Both the scoop or scraper S and
 45 the blades D are within convenient control by the operator through their controlling-levers, and said operator may stand or ride upon the machine and drive the team and manipulate all the parts at his will.

50 Power is communicated to both elevator E and conveyer C from one of the rear wheels F, on the hub of which is mounted a ratchet-wheel 7, and by the side of said wheel is a gear G, loosely mounted on the rear axle F' and carrying a pawl *g*, normally engaged with
 55 ratchet 7, but adapted to be thrown out by beveled sliding sleeve *g*¹ on the hub of wheel F and a handle-lever K, controlling said sleeve. If the said elevator and conveyer are to be
 60 stopped or thrown out of power connections at any time, the sleeve *g*¹ is moved toward ratchet 7 by lever K, and the arm 8 on said pawl will ride up on the said beveled sleeve and raise the pawl out of engagement with the ratchet, and
 65 thus break the actuating connections. From

wheel G power is communicated to gear H and shaft *h*, supported beneath frame A and on which is a large sprocket-wheel H' at the opposite end to actuate elevator E and to connect
 70 bevel-gears 9 and 10 to actuate conveyer C, and said gears 9 and 10 are adapted to slide on said shaft together within limits, so as to throw one or the other in mesh with bevel-pinion 12 on
 75 shaft 13, according as one direction of rotation or the other is wanted for said shaft 13 and travel of conveyer C. Pursuing this train of mechanism for said conveyer, the shaft 13 carries a sprocket-wheel 14, from which a chain
 80 15 runs over a wheel 16 on a short shaft above suitably supported from the main frame and on which is a sprocket-wheel 17, in mesh with the comparatively loose sprocket-chain 18, which controls conveyer C.

Driving connection is made with either bevel-wheel 9 or 10 on shaft *h*, according to
 85 the side of the machine to which the earth is to be conveyed, and any suitable means may be employed to shift said beveled gears on said shaft, or both gears can be thrown out of mesh with pinion 12 and the conveyer stopped.
 90 Cross-rods 28 support conveyer C at one elevation or another on its standards 19, and the said conveyer can be shifted bodily to deliver the earth at either side and is held by a cross-rod, bolt, or the like *h*⁴.
 95

The power connections for elevator E are through wheel H' and chain 20 to counter-shaft 21, supported on uprights 22 and carrying idler-wheel 23, over which chain 20 en-
 100 engages to drive said shaft 21. From shaft 21 sprocket-chain 24 goes to wheel 26 on rear shaft 25 and which serve to actuate the elevator E. A suitable drum 29 carries the elevator E at its top.

The foregoing or equivalent mechanism
 105 may be employed to drive both the elevator E and conveyer C, and the elevation of the respective ends of the transverse conveyer C and the inclination thereof toward one side or the other and its shifting to either side is
 110 effected as hereinafter described.

It is to be noted that by the particular arrangement of sprocket-chain mechanism for driving the elevator E, as seen in Fig. 2, the
 115 said mechanism is brought into such positions or relations as not to interfere with the transverse conveyer or the mechanism to drive the same, and this holds good whether the elevator E and its operating parts be in the position seen in Fig. 2 or with the elevator raised
 120 relatively as seen in dotted lines, Fig. 5, and this is one of the objects in making the present drive connections from the sprocket-wheel H' to the rear of the elevator E. Otherwise the said drive connections might be very ma-
 125 terially changed and serve our purpose as well. In any event when the front of the elevator E is raised or lowered the rear thereof is simultaneously and automatically raised and lowered also, because the elevator is caused
 130

to move bodily to the rear if it be raised at the front, and forward if it be lowered at the front, and this occurs always when the operator works the racks or rack-bars c^4 by reason of the connections 2 and 3 at the front.

In the construction thus shown and described the elevator E places the earth upon the conveyer C at its rear, which runs at right angles with the said elevator, and in return places the earth into a dump-wagon or otherwise at the side of the machine. The blades D are supposed to be more or less sharpened and are curved in cross-section, so as to give them a cutting edge to more easily remove the earth, and are diagonal to the line of draft, as shown, thereby drafting the earth inwardly into the path of the scoop and elevator, as above described. The said elevator, of course, is supported upon a suitable frame of its own; but in this description the frame and the endless carrier thereon are treated as comprised within the general term of "elevator."

The machine serves many purposes and is especially useful in road making and leveling and where its division is required and the deposit of the earth at other points to fill in cuts and the like.

What we claim is—

1. In an earth-handling machine, a supporting-frame and an endless elevator therein, and means to raise both ends of the elevator simultaneously, comprising hand-controlled mechanism at the front and automatically-controlled mechanism at the rear actuated through said elevator, and draft-links at the front from the bottom of the elevator to said supporting-frame forward thereof, substantially as described.

2. In an earth-handling machine, a suitable supporting-frame and an endless elevator therein, means to adjustably fix the elevation of the front end thereof, and draft connections therefrom to said supporting-frame, supports for the rear of the elevator adapted to travel back and forth upon the said supporting-frame and inclines on which said supports ride, substantially as described.

3. In an earth-handling machine, a main supporting-frame, an endless earth-elevator in said frame and means at both ends of said elevator to raise and lower the same in respect to the supporting-frame, comprising inclines on the supporting-frame, rolling supports for said elevator resting on said inclines and lifting and draft connections at the front of the frame, substantially as described.

4. In earth-handling machines, a suitable supporting-frame and wheels therefor, an endless earth-elevator in said frame, rack-and-pinion mechanism to raise and lower the front end of said elevator, and standards and inclines therefor supporting the rear of said elevator, substantially as described.

5. In earth-handling machines, a supporting-frame and wheels therefor, an endless earth-elevator in said frame, means at the front of said elevator to raise and lower the same and move the elevator bodily back and forth, inclined tracks upon the rear of said supporting-frame and standards on said elevator having rollers running on said tracks, whereby when the front of the elevator is raised the said roller will mount said tracks and also raise the rear of the elevator, substantially as described.

6. In earth-handling machines, the main supporting-frame and the elevator therein, and means to raise and lower the elevator comprising a bail and rack-bars and pivoted brace-links engaged with said bail at different elevations, substantially as described.

7. In an earth-handling machine, a supporting-frame and an endless elevator therein having a scoop fixed on its lower end, a bail and rack-bars connected with the elevator to raise and lower the same, pivoted brace-links engaging said bail above and below, and means at the rear of the said elevator to automatically raise the same in respect to the supporting-frame when the front of the said carrier is raised, substantially as described.

8. In earth-handling machines, an endless elevator and a scoop thereon, and drift-blades at the front and side of said scoop provided with standards, keepers on said supporting-frame confining said standards, and separate levers and mechanism to raise and lower said blades and standards, substantially as described.

9. In earth-handling machines, a supporting-frame and an endless elevator therein and a scoop on said elevator, means to raise and lower the front end of said elevator comprising a bail fixed to the elevator and scoop, racks pivotally connected with the top of said bail and means to raise and lower the same, and top and bottom braces for said bail, substantially as described.

10. In earth-handling machines, a suitable supporting-frame and an endless elevator therein provided with a scoop to raise the earth onto the elevator, in combination with a side conveyer at the rear of the said elevator and mechanism to actuate both said conveyers, standards on which said conveyer is supported and said parts relatively constructed to shift the conveyer to unload at either side, substantially as described.

In testimony whereof we sign this specification in the presence of two witnesses.

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DAVID E. GRAVES.

CARL H. DUDLEY.

Witnesses:

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