

No. 693,002.

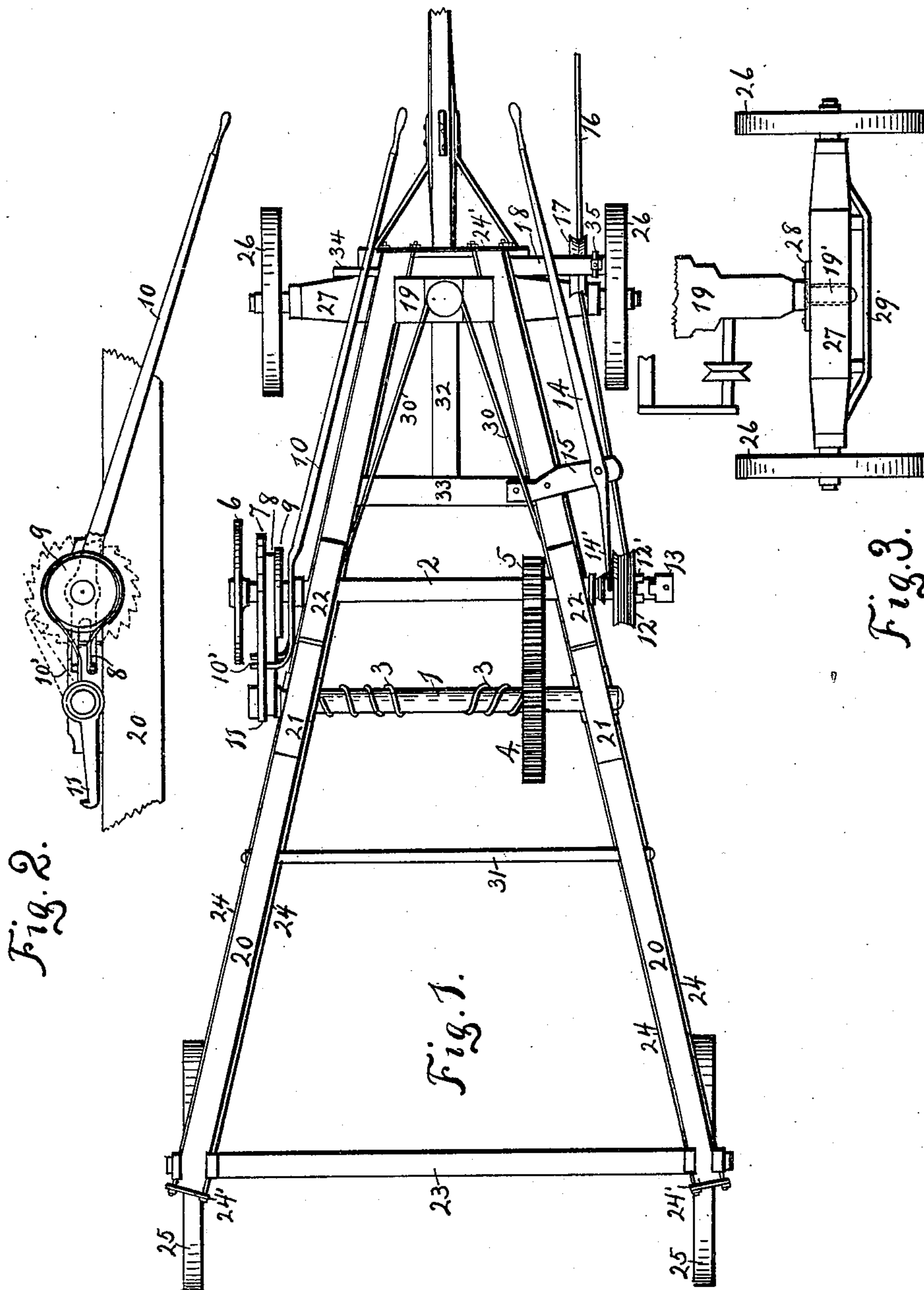
Patented Feb. 11, 1902.

F. A. FULGHUM.
STONE LIFTING MACHINE.

(Application filed Apr. 27, 1900. Renewed Dec. 30, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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INVENTOR

Fredrick A. Fulghum,
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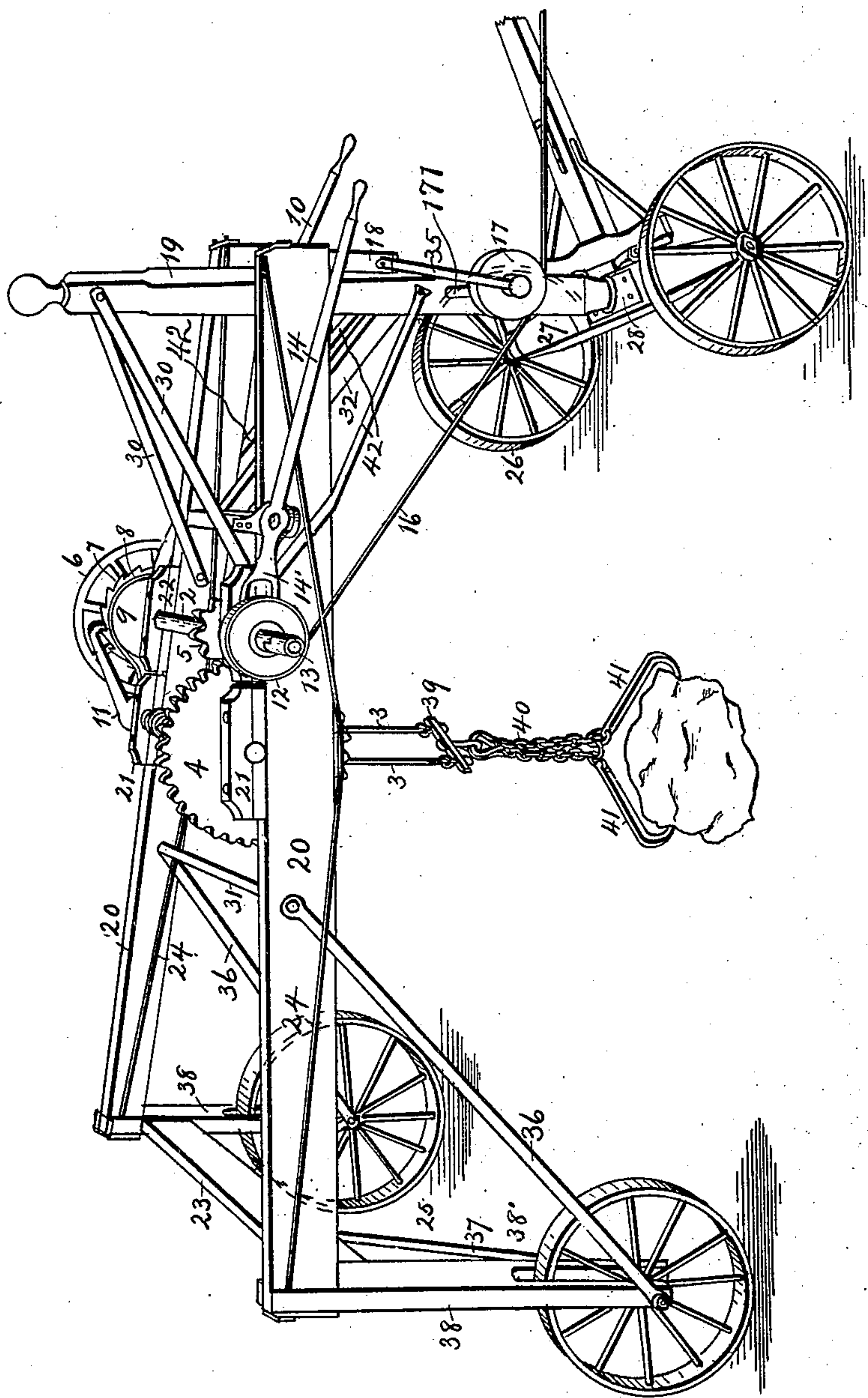
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Fig. 4.



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UNITED STATES PATENT OFFICE.

FREDRICK A. FULGHUM, OF WATERLOO, IOWA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HIMSELF, AND W. L. M. BLUMENSTIEL AND W. T. SMITH, OF CHARLES CITY, IOWA.

STONE-LIFTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 693,002, dated February 11, 1902.

Application filed April 27, 1900. Renewed December 30, 1901. Serial No. 87,704. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK A. FULGHUM, a citizen of the United States of America, and a resident of the city of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Stone-Lifting Machines, of which the following is a specification.

My invention relates to improvements in stone-lifting machines; and the objects of my improvements are to provide, first, facilities for shifting off and on the power to the gearing; second, a combined ratchet and friction-brake; third, sufficient space between the frame-posts to allow of the handling of large objects and the clearing of cavities in the ground; fourth, the even distribution of the load on both ends of the axles of the rear wheels; fifth, an improved bearing in front axle for the lower end of the front post, and, sixth, a braced frame capable of sustaining the greatest strain likely to be applied to it. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the top part of the entire machine. Fig. 2 is a detail view in elevation of the friction-brake, the hand and ratchet wheels being removed. Fig. 3 is a detail view in elevation, showing the manner of pivoting the foot of the front post to the front axle; and Fig. 4 is a perspective view of the entire machine.

Similar numbers refer to similar parts throughout the several views.

The frame of said machine, composed of the timbers 20 20 and 23, is constructed of a triangular shape and fastened together and to the corner-posts 38 38 and front post 19 by means of the braces 30 31 32 33 36 37 42 and by the truss-rods 24 24. These braces and rods especially strengthen the frame about the point of connection of the side timbers and the front post, lending it a rigidity equal to any strain likely to be imposed upon it. The brace 37 is arched and attached to the frame 23 and corner-posts 38 38. The corner-posts 38 38 are bifurcated at their lower ends, the short axles of the wheels 25 25 being pivoted therein and in the lower ends of the brace

37. This mode of pivoting the rear wheels allows the load to settle evenly on either end of the axles, and the fact that the axles are not integral with the ends of the brace-rod 37 prevents breakage or bending of the axles when the wheels are under transverse stress in passing over or resting upon rough ground. The front post 19 is provided at its lower end with a depending pin 19', which rests upon and passes through the bearing 28 and is stepped within a hole extending from top to bottom of the axle 27. This pin 19' is not keyed or headed and is kept in position solely by means of the weight of the machine superimposed upon it. The front axle 27 is strengthened by means of the truss-rod 29 along its under side. The wheels 25 25 26 26 are provided with broad tires.

On the upper surface of the frames 20 20 are fastened the bearing-boxes 21 21 22 22 by means of bolts, and their upper halves are separable. The boxes 21 21 furnish bearings for the working shaft 1, while the boxes 22 22 provide bearings for the power-shaft 2. The gear-wheel 5 on the shaft 2 transmits the power to the larger gear-wheel 4 on the shaft 1. To one end of the power-shaft 2, which extends outside of the bearing-box 22, is attached a clutch member 13. The pulley 12 is arranged to rotate on this shaft and is movable either way lengthwise thereon by means of the fingers 14' of the lever 14. When the pulley is moved outward, its clutch member 12' engages with the member 13 on the end of the shaft 2, and in like manner when the pulley is moved inward said members are disengaged, and, the motion of the shaft ceasing, the shaft is kept from rotating in the opposite direction through the stress of the load by means of the ratchet 7 and pawl 11. The cable 16 is passed downward under the pulley 17, which lowers the draft to a convenient point to attach to the whiffletree. The pulley 17 is arranged to shift from side to side upon a shaft 171, attached to the front post 19, in order to accommodate itself to irregular or sidewise movements of the draft. The cable is kept from slipping off the pulley 17 by means of any suitable retaining device, such as a groove in the pulley. The bar 18, 100

connected to the front post 19 and upon which the hand-lever 14 rests, has a brace 35 connecting its outer end to the outer end of the shaft 171, on which the pulley 17 revolves, in order to impart proper rigidity to said shaft.

Attached to that end of the power-shaft 2 which is opposite the pulley 12 is the friction-disk 9. This friction-disk is recessed in its periphery for the retention of a friction-band 8, which latter is a flat metallic band passed about the friction-disk, having one end fixed to a collar passed about the outer end of the shaft 1, while the other end is attached to the lower limb of the fork of a lever 10. Also attached to the same end of the power-shaft 2 is the ratchet-wheel 7 and the hand-wheel 6. The hand-lever 10 is pivoted on the shaft 2 at a point between the friction-disk 9 and a collar attached to the shaft and is forked at its extremity 10'. The upper limb of this fork is bent outwardly horizontally and passes between the upper surface of the friction-band 8 and the pawl 11. The lower limb of said fork is also bent outwardly horizontally, and the lower end of the friction-band is attached to it. When it is desired to slow down the movement of the power-shaft 2, the hand-lever 10 is depressed, which movement results in raising the fork 10'. The upper limb pushes up and releases the pawl from the ratchet, while the lower limb stretches the friction-band 8, causing it to clasp the recessed periphery of the friction-disk 9, retarding its motion and that of the power-shaft. The hand-wheel 6 is attached to the power-shaft in order to permit of light loads being lifted by hand.

The wire cables 3 3 are arranged to wind about the lifting-shaft 1. The ends of these cables are attached to a cross-bar 39, at whose middle is a swivel supporting the chains 40 and the clutch-hooks 41 41.

The manner of operating the machine is as follows: The clutch-hooks 41 41 are grappled to the object sought to be raised. The hand-lever 14 is moved inward on its pivot 15, thus shifting the pulley 12 outward until the clutch members 12' and 13 engage. The draft is applied to the cable 16, which by means of the pulleys and gearing 4 5 winds up the cables 3 3 and raises the load to the proper height. The draft ceasing, the pawl-and-ratchet mechanism holds the load in place. In lowering the load the hand-lever 10 is depressed, raising the fork 10'; in turn releasing the pawl and causing the friction-band to exert sufficient restraint upon the friction-disk to regulate the speed of revolution of the shaft.

The wire cables are thought to possess superiority over chains, as being smoother and causing less friction and jerkiness in winding up.

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

1. In a machine of the character described, the combination with a power-shaft, and a friction-disk and ratchet-wheel thereon; of a pawl engaging said ratchet-wheel, a band-brake connected at one end to a fixed point and leading around said disk, and a lever having a fork of which one limb is attached to the other end of the band and the remaining limb engages the pawl, whereby the pawl is tripped and the brake is applied simultaneously, substantially as described.

2. In a machine of the character described, the combination with a power-shaft, a friction-disk and ratchet-wheel thereon, and a second shaft parallel to and driven by the power-shaft; of a pawl pivoted on the driven shaft and engaging said ratchet-wheel, a band-brake connected at one end to said driven shaft and leading around said disk, and a lever having a fork of which one limb is attached to the other end of the band and the remaining limb engages the pawl, whereby the pawl is tripped and the brake is applied simultaneously, as and for the purpose set forth.

3. In a machine of the character described, the combination with a power-shaft, a friction-disk and ratchet-wheel thereon, a pulley loose on the power-shaft, a cable wound around the pulley and led to a suitable source of power, and a clutch between the pulley and power-shaft; of a pawl engaging said ratchet-wheel, a band-brake connected at one end to a fixed point and leading around said disk, and a lever having a fork of which one limb is attached to the other end of the band and the remaining limb engages the pawl, whereby the pawl is tripped and the brake applied simultaneously, as and for the purpose set forth.

4. In a machine of the character described, the combination with a power-shaft, a friction-disk and ratchet-wheel thereon, a hand-wheel secured rigidly to the extremity of this shaft, a second shaft parallel with and geared to the power-shaft, a pulley loose on the power-shaft, a cable wound around the pulley and led to a suitable source of power, and a clutch between the pulley and power-shaft; of a pawl pivoted on the driven shaft and engaging said ratchet-wheel, a band-brake connected at one end to said driven shaft and leading around said disk, and a lever having a fork of which one limb is attached to the other end of the band and the remaining limb engages the pawl, whereby the pawl is tripped and the brake is applied simultaneously, substantially as described.

5. In a machine of the character described, the combination with a framework consisting of timbers suitably supported by posts, a horizontal shaft projecting from one post at a relatively low point, and a pulley mounted thereon for rotation and longitudinal movement; of a power-shaft mounted in relatively high bearings on the timbers, a second shaft

driven therefrom, and a cable leading under said pulley and around a drum on the power-shaft, as and for the purpose set forth.

5 6. In a machine of the character described, the combination with a framework consisting of timbers suitably supported by posts, a horizontal shaft projecting from one post at a relatively low point, and a grooved pulley mounted on the shaft; of a power-shaft mounted
10 in relatively high bearings on the timbers, a second shaft driven therefrom, and a cable leading under said pulley and around a drum on the power-shaft, as and for the purpose set forth.

15 7. In a lifting-machine, the combination with a framework comprising timbers in triangular shape, posts supporting the corners, wheels mounted in slots in two of these posts,

and a wheeled truck and trussed support swiveled to the remaining post; of a driving 20 and a driven shaft journaled across said timbers, gears connecting them, a pulley on the driving-shaft from which leads a power-cable, two cables wound on the driven shaft and leading to a cross-bar, clutch-hooks, chains 25 connecting them with said cross-bar, a pawl and brake for preventing a retrograde movement of the shafts, and a single lever for simultaneously tripping them both, all substantially as described. 30

Signed by me at Waterloo, Blackhawk county, Iowa, this 23d day of April, 1900.

FREDRICK A. FULGHUM.

Witnesses:

HENRY D. HAFFA,

JACOB H. GOSWILLER.