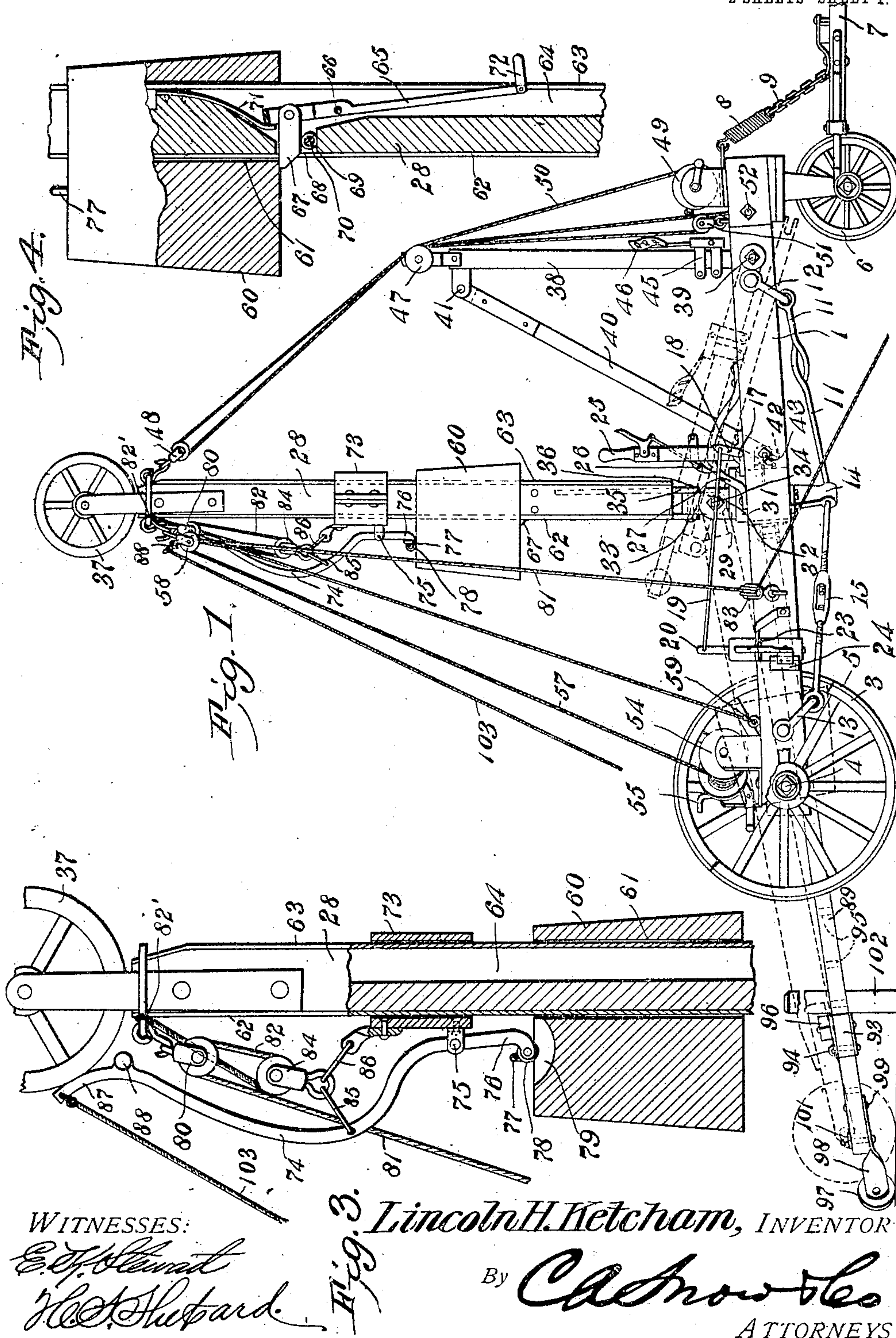


No. 819,764.

PATENTED MAY 8, 1906.

L. H. KETCHAM.
POST DRIVING MACHINE.
APPLICATION FILED NOV. 23, 1905.

2 SHEETS—SHEET 1.

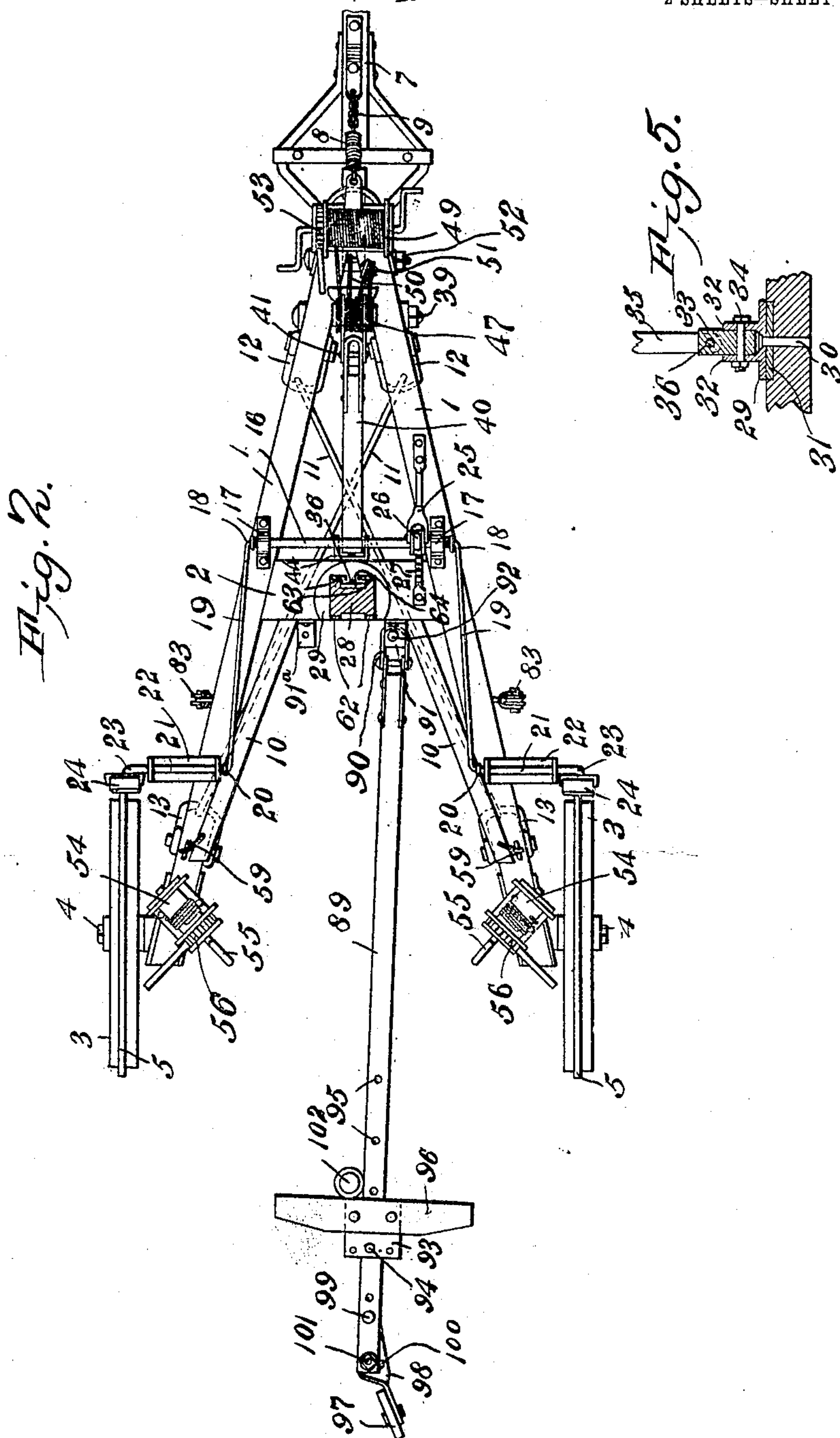


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WITNESSES:

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LINCOLN HAMLIN KETCHAM, OF CORNING, OHIO.

POST-DRIVING MACHINE.

No. 819,764.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed November 23, 1905. Serial No. 288,806.

To all whom it may concern:

Be it known that I, LINCOLN HAMLIN KETCHAM, a citizen of the United States, residing at Corning, in the county of Perry and State of Ohio, have invented a new and useful Post-Driving Machine, of which the following is a specification.

This invention relates to machines for driving posts, piles, and the like, and has for its object to materially facilitate the handling of the machine in operating the same as well as during transportation thereof.

Other objects of the invention reside in the novel mounting of the mast for the support of the hammer, whereby the mast may be raised and lowered and also swung in various directions to adjust the same to a vertical position regardless of the condition of the ground upon which the machine stands, to facilitate the raising and lowering of the mast, to provide novel means for elevating and releasing the hammer, to provide improvements in the spacing means for gaging the distances between a line of posts, and to improve the construction of the truck for carrying the operating mechanism of the machine.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side view of a post-driving machine embodying the features of the present invention. Fig. 2 is a plan view thereof with the mast cut away. Fig. 3 is an enlarged fragmentary view of the hammer-elevating means, parts being broken away to show the slidable mounting of the hammer upon the mast. Fig. 4 is a detail fragmentary sectional view illustrating the means for supporting the hammer in a partially-elevated position. Fig. 5 is a detail sectional view taken through the connection between the foot of the mast and the supporting-truck.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

For the support of the operating parts of the present machine I employ a wheeled

truck made up of forwardly-converged sills or side beams 1, which are suitably connected at their forward ends and are also connected substantially midway of their ends by a cross-bar 2. A supporting-wheel 3 is mounted upon a stub-axle 4, projecting outwardly from the rear end of each beam or sill 1, and this wheel is provided with a centrally-disposed peripheral flange 5 to sink into the ground and prevent sidewise slipping of the wheel when the machine is in operation. At the forward end of the truck there is a caster-wheel 6, to which is connected a tongue 7 for the connection of the draft-animals when transporting the machine. A spring 8 and a chain 9 are employed to support the tongue when the machine is in use and the draft-animals are removed therefrom.

To stiffen and strengthen the truck-frame, wooden brace-bars 10 are provided between the cross-bar 2 and the inner sides of the rear portions of the side bars 1. Beneath the frame of the truck are crossed metallic brace-rods 11, each of which is connected at its forward end to a bail or link 12, embracing and connected to one of the side bars of the frame, while its rear end is connected to a similar link 13, carried by the rear end portion of the other side bar of the frame. The two brace-bars cross in front of the cross-bar 2, and each of them passes through a hanger 14, depending from the under side of the frame, preferably from the cross-bar 2. As clearly indicated in Fig. 1 of the drawings, it will be seen that each brace-rod is formed in two sections which are connected by a turn-buckle 15 in rear of the cross-bar 2, whereby the proper tension may be maintained upon the braces. It will here be explained that each brace-rod passes loosely through its hanger 14, and the latter forms a strut for the truss-brace 11, which materially stiffens and strengthens the frame.

The brake mechanism employed upon the present truck includes a rock-bar 16, disposed transversely across the frame in front of the cross-bar 2 and mounted in bearings 17, each end of the bar being provided with an upstanding crank-terminal 18, located at the outer side of the adjacent bearing. From each crank there extends rearwardly a connecting rod or link 19, which has its rear end connected to the inner upstanding crank-arm 20 of a rocking brake-bar 21, the latter being mounted in a bearing-bracket 22, car-

ried by the frame of the truck and projecting outwardly therefrom. A depending crank-arm 23 is provided upon the outer end of the brake-bar and carries the shoe 24 for engagement with the adjacent supporting-wheel of the truck. A brake-lever 25 is carried by the bar 16 and has a handle-controlled dog 26, engaging a rack 27, carried by the frame of the truck, whereby the brake-shoes may be conveniently applied to and removed from the rear wheels of the truck.

The mast 28 for the support of the hammer is mounted upon the cross-bar 2 in the manner best shown in Fig. 5 of the drawings. 15 A turn-table 29 is centered upon the top of the cross-bar 2 and is held thereon by a pivot-pin 30, there being a metallic wear-plate 31 interposed between the turn-table and the wooden cross-bar. Ears 32 rise from the 20 turn-table at opposite sides of the center thereof, and between these ears there is a link 33, which is pivotally connected to the ears by a pin 34. A pair of metallic straps 35 embrace the front and rear sides of the foot 25 of the mast and project below the same so as to embrace the link 33, and a pivot-pin 36 pierces the straps and the links, so as to form a pivotal connection at right angles to the pivotal connection 34. By this construction the mast may be rotated upon its longitudinal axis and also swung in directions at right angles to one another, whereby the mast may be adjusted to vertical position without regard to the character of the 35 ground upon which the machine stands.

When the machine is in transportation, the mast is swung downwardly and rearwardly into the position shown by dotted lines in Fig. 1 of the drawings, with its free end supported by a wheel or roller 37, carried by and 40 projected beyond the free end of the mast. For raising and lowering the mast upon its pivotal connection with the truck there is provided a hoisting mechanism including a 45 derrick made up of a post or standard 38, having its lower end pivotally supported between the forward end portions of the side bars 1 upon a rod 39, and a brace or prop 40, pivotally connected at its upper end to the 50 rear side of the standard 38 adjacent its top, as at 41. The lower end of the prop 40 is bifurcated, as at 42, (shown in Fig. 1 of the drawings,) with the bifurcated portion straddling a rod or bar 43, piercing the side bars 1 55 of the truck. This rod is braced at its middle by a yoke-shaped bracket 44, carried by the front side of the cross-bar 2, the lower end of the prop 40 being engaged with the rod or bar between the sides of the bracket.

60 Upon the standard 38 there is a clamp 45, which is adjustable longitudinally thereon, and this clamp carries a driver's seat 46, located upon the front of the standard. When the machine is in transportation, the prop 40 65 is disengaged from the rod or bar 43 and

folded downwardly with the standard 38, whereby the driver's seat is brought into position for use. Upon the top of the derrick, formed by the standard 38 and the prop 40, is a series of pulleys 47, and at the top of the 70 front side of the mast there is a double block 48. A hoisting-drum or windlass 49 is mounted upon the front extremity of the truck in front of the derrick, and from this drum leads a cable 50, which passes up 75 across one of the series of pulleys 47, through the block 48, thence through another of the pulleys 47 downwardly to a block 51, mounted upon the frame of the truck between the drum and the derrick, thence upwardly to 80 the block 48, and, finally, downward between the sides of the truck and secured to a rod 52, piercing the frame of the truck between the windlass and the derrick. By this arrangement of hoisting mechanism a very 85 powerful hoisting operation may be obtained. The hoisting-drum 49 is of course provided with a suitable ratchet device 53 to hold the mast against backward movement when being elevated. 90

It is proposed to brace or stay the mast when adjusted in an upright position, and this is accomplished from the rear end of each side bar of the truck-frame. Upon the rear end of each side bar 1 there is a drum 95 54, provided with a winding-crank 55 and a ratchet 56. A cable 57 leads upwardly from the windlass to a block 58, carried by the top of the mast, and thence downwardly and secured to the adjacent frame-bar in front of 100 the windlass, as at 59. When the mast is being elevated, the ratchets of the drums 54 are thrown out of operation in order that the stay-cables 57 may quickly unwind from the drum. After the mast has been adjusted to 105 the desired position the ratchets 56 are thrown into operation, and the drums 54 are operated to strain the cables 57, and thereby hold the mast rigidly in its upright position.

The hammer 60 is in the nature of a solid 110 weight which is slightly tapered upwardly and is provided with an upright passage 61, receiving the mast and of a size to permit of the free slidable movement of the hammer upon the mast. To reduce friction between 115 the mast and the hammer, spaced tracks or metallic plates 62 are provided upon the rear side of the mast, and similar plates 63 are provided upon the front side of the mast, whereby the bearing-surface between the 120 hammer and the mast is reduced and metal contacts with metal instead of metal with wood. The front face of the mast is grooved or channeled, as at 64, between the front plates 63, and within this channel there is 125 mounted a lever 65, fulcrumed intermediate of its ends, as at 66, with its upper end carrying a substantially horizontal bolt 67, working through an opening 68, formed in the back of the mast and communicating with the 130

channel 64. This bolt rests upon an anti-friction-roller 69, located in the opening 68 and mounted upon a pivot-rod 70, passing through the mast. A spring 71 bears against the upper end of the lever 65 with a tendency to normally and yieldably maintain the bolt 67 within the mast so as not to interfere with the movement of the hammer. When it is desired to support the hammer in a partially-elevated position, as when setting a post preparatory to driving the same, the hammer is elevated above the bolt 67, and then the lower end of the lever 65 is drawn outwardly so as to project the bolt in position to support the hammer when lowered thereonto. It is proposed to hinge a link or handle 72 to the lower free end of the lever 65 for convenience in manipulating the latter, said handle capable of being folded back into the channel 64 to permit of the hammer passing up and down the mast.

The hoisting mechanism for the weight includes a slidable sleeve 73, embracing the mast above the hammer and having an upright tong or lever 74 fulcrumed to the rear side of the slide, as at 75, adjacent the lower end of the lever. The lower end of this lever is provided with a rearwardly-directed bifurcated toe portion 76, designed to engage beneath a yoke-shaped bail or hanger 77, carried by the top of the hammer. An anti-friction-roller 78 is journaled in the bifurcated portion of the lever to facilitate the engagement and disengagement of the lever with respect to the hanger 77. A socket 79 is formed in the top of the hammer beneath the hanger so as to accommodate the toe of the lever. At the top of the mast and at the rear side thereof there is a block or pulley 80, around which passes a hoisting-cable 81, having one portion hung in a bight 82 from the block with its end secured to the top of the mast, as at 82'. The other portion of the cable extends downwardly to a guide or pulley 83 upon one of the side bars 1 of the truck, from which it leads outwardly, and is provided with a whiffletree (not shown) for the connection of a draft-animal. As clearly indicated in Fig. 2 of the drawings, it will be seen that there is a pulley 83 at each side of the truck-frame in order that the hoisting mechanism for the hammer may be operated from either side of the machine. In the bight 82 of the cable 81 there is a block or pulley 84, from which links 85 and 86 extend to the lever 74 and the slide 73. Upon examination of Fig. 3 of the drawings it will be noted that the wheel 37 at the top of the mast 28 is in the upward path on the upper free end of the lever 74 for the purpose of automatically tripping the lever from the hammer to release the latter when elevated to its limit. The upper free end of the lever 74 is bowed, as at 87, to properly engage the wheel 37, and a cross-head 88 is carried by the lever at a

point slightly below its upper end for engagement with the wheel 37 should the lever 74 be swung laterally out of the vertical plane of the wheel.

Extending rearwardly from the truck is a spacing-bar or gage-bar 89, having its forward end provided with a clevis 90, loosely and detachably engaged with a bracket or seat 91, carried by the rear of the cross-bar 2 adjacent one end thereof, there being a removable pin 92 piercing the bracket and passing through the clevis. A similar bracket 91^a is provided at the other end of the cross-bar 2, whereby the gage 89 can be shifted from one side to the other of the truck, according to the requirements of the conditions under which the machine is being used. Upon this gage-bar there is a slide 93, carrying a removable pin 94 for individual engagement with a series of perforations 95, formed in the bar. A cross-head 96 is carried by the slide and projects at opposite sides of the bar. At the rear of the bar 89 there is a trailer-wheel 97, carried by a bracket 98, which is pivotally connected to the under side of the bar, as at 99. This bracket is provided with a transverse series of perforations, one of which has been shown at 100, and a removable bolt or pin 101 pierces the bar for engagement with the individual openings to hold the bracket at different adjusted positions.

In practice the hammer 60 is elevated and supported by the bolt 67, after which the post to be driven is set in the ground, and then the hammer is elevated until the lever 74 is automatically tripped, whereupon the hammer will drop and strike upon the top of the post so as to drive the latter into the ground. This operation is repeated until the post has been driven to the desired extent. Preparatory to driving the next post the supporting-truck is advanced until the cross-head 96 of the gage-bar 89 engages the post 102, which has just been driven, whereby the machine is stopped in the proper position for driving the next post. The distance between posts may be regulated by the adjustment of the cross-bar 96 upon the gage-bar. In driving to a new position the trailer 97 is set, as in Fig. 2, and the gage-bar is drawn laterally to disengage the cross-head 96 from the post, whereupon the machine is drawn ahead and the gage-bar will automatically swing or trail inwardly under the influence of the trailer 97, so as to bring the cross-head 96 into position for engagement with the post that has just been driven. When the gage-bar is located at the other side of the machine, the trailer 97 is of course set at the reverse inclination to draw the gage-bar inwardly in the manner hereinbefore described. In order that the hammer may be tripped before it reaches its upper limit, a cable 103 is connected to the upper end of the lever 74, whereby upon pulling

down upon this cable the lever 74 may be swung out of engagement with the hammer and the latter released to drop upon the post.

Having thus described the invention, what is claimed is—

1. In a post-driving machine, the combination with a truck, of a turn-table thereon, a member hinged to the turn-table, a mast hinged to said member upon an axis at right angles to that of the hinged member, guys for adjusting the mast, a hammer slidable upon the mast, and means for elevating and releasing the hammer.

2. In a post-driving machine, the combination with a truck, of a turn-table thereon provided with ears at opposite sides of the center of the table, a link pivoted between the ears, a mast pivoted to the link upon an axis at right angles to that of the link, hoisting means for the mast, guys between the mast and the truck, a hammer slidable upon the mast, and means for elevating and releasing the hammer.

3. In a post-driving machine, the combination with a truck, of a mast hinged thereon and capable of being lowered to the ground, a wheel carried by the free end of the mast for engagement with the ground when the mast is lowered, a hammer slidable upon the mast, and means for elevating the hammer including a hammer-releasing trip, the wheel upon the mast being located in the path of the trip to automatically release the hammer.

4. In a post-driving machine, the combination with a truck, of a mast thereon, a hammer slidable upon the mast, elevating and releasing means for the hammer, a gage-bar trailing from the truck, a post-engaging

cross-head carried by the gage-bar, and a connection between the gage-bar and the truck which is shiftable to either side of the truck.

5. In a post-driving machine, the combination with a truck, of a mast, a hammer working thereon, means for elevating and releasing the hammer, a gage-bar trailing from the truck and shiftable from one side to the other thereof, and a post-engaging cross-head carried by the bar and projecting at opposite sides thereof.

6. In a post-driving machine, the combination with a truck, and a hammer carried thereby, of a gage-bar trailing from the truck and shiftable from one side to the other thereof, post-engaging means carried by the bar, and a trailer-wheel carried by the gage-bar and shiftable to reverse inclinations across the bar.

7. In a post-driving machine, the combination with a truck, and a hammer carried thereby, of a gage-bar trailing from the truck and shiftable from one side to the other thereof, post-engaging means carried by the bar, a trailer-wheel, a bracket carrying the wheel and pivoted to the bar, said bracket having a transverse series of openings, and a fastening carried by the bar for individual engagement with the openings of the bracket to hold the latter in adjusted positions.

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

LINCOLN HAMLIN KETCHAM.

Witnesses:

JOHN A. FISHER,
C. E. ROBERTS.