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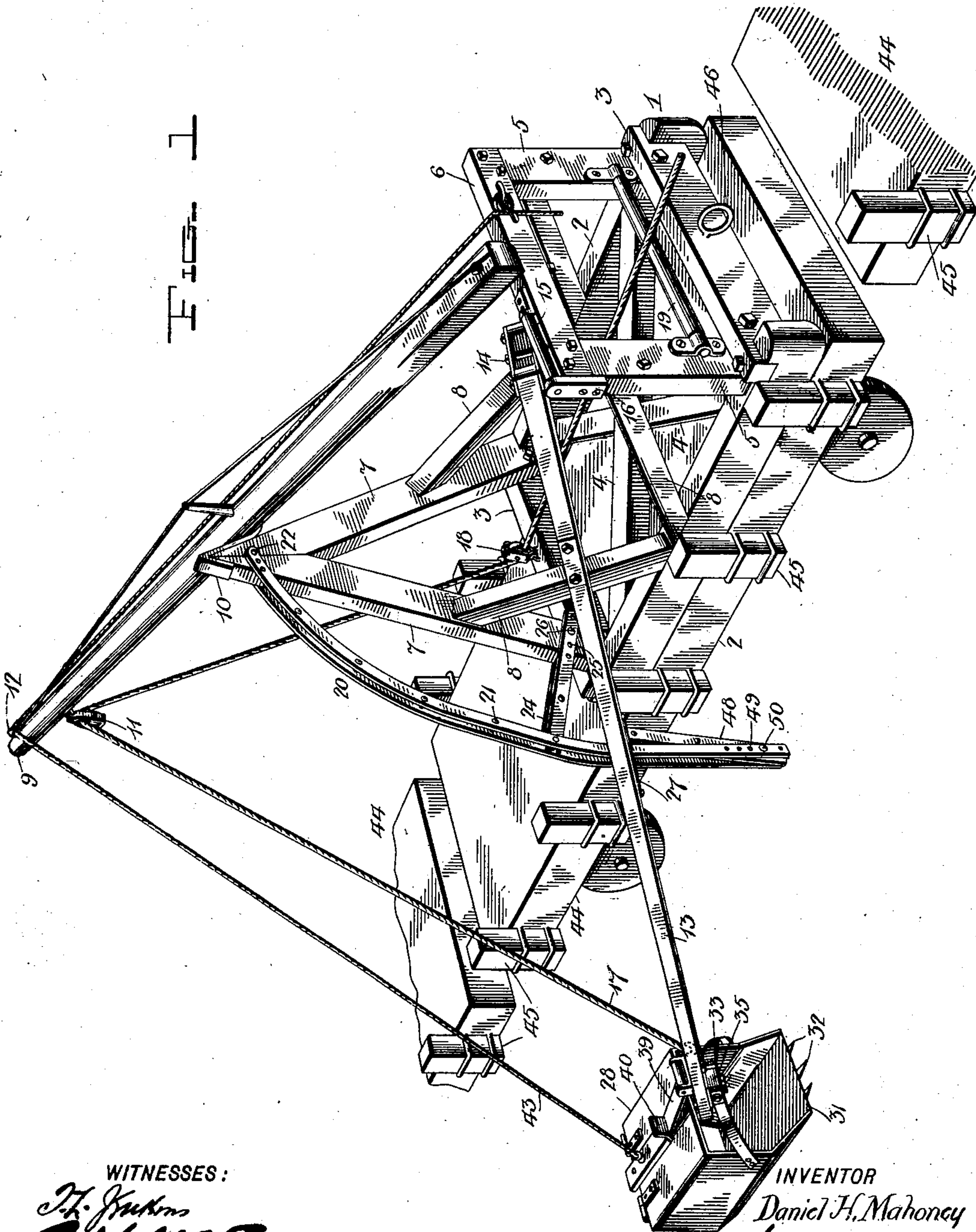
Patented June 3, 1902.

D. H. MAHONEY.
EXCAVATING AND LOADING MACHINE.

(Application filed Sept. 5, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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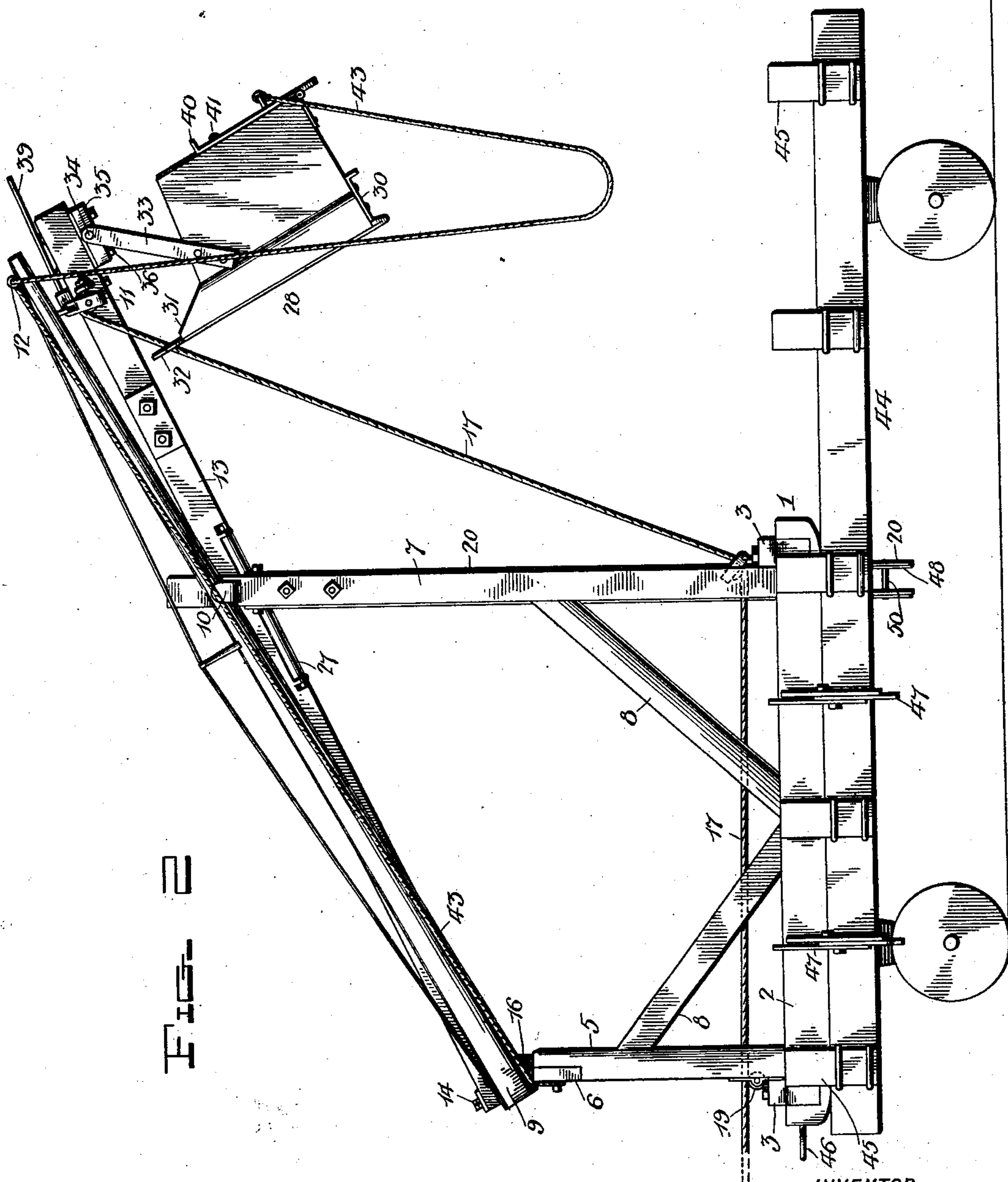


FIG. 2

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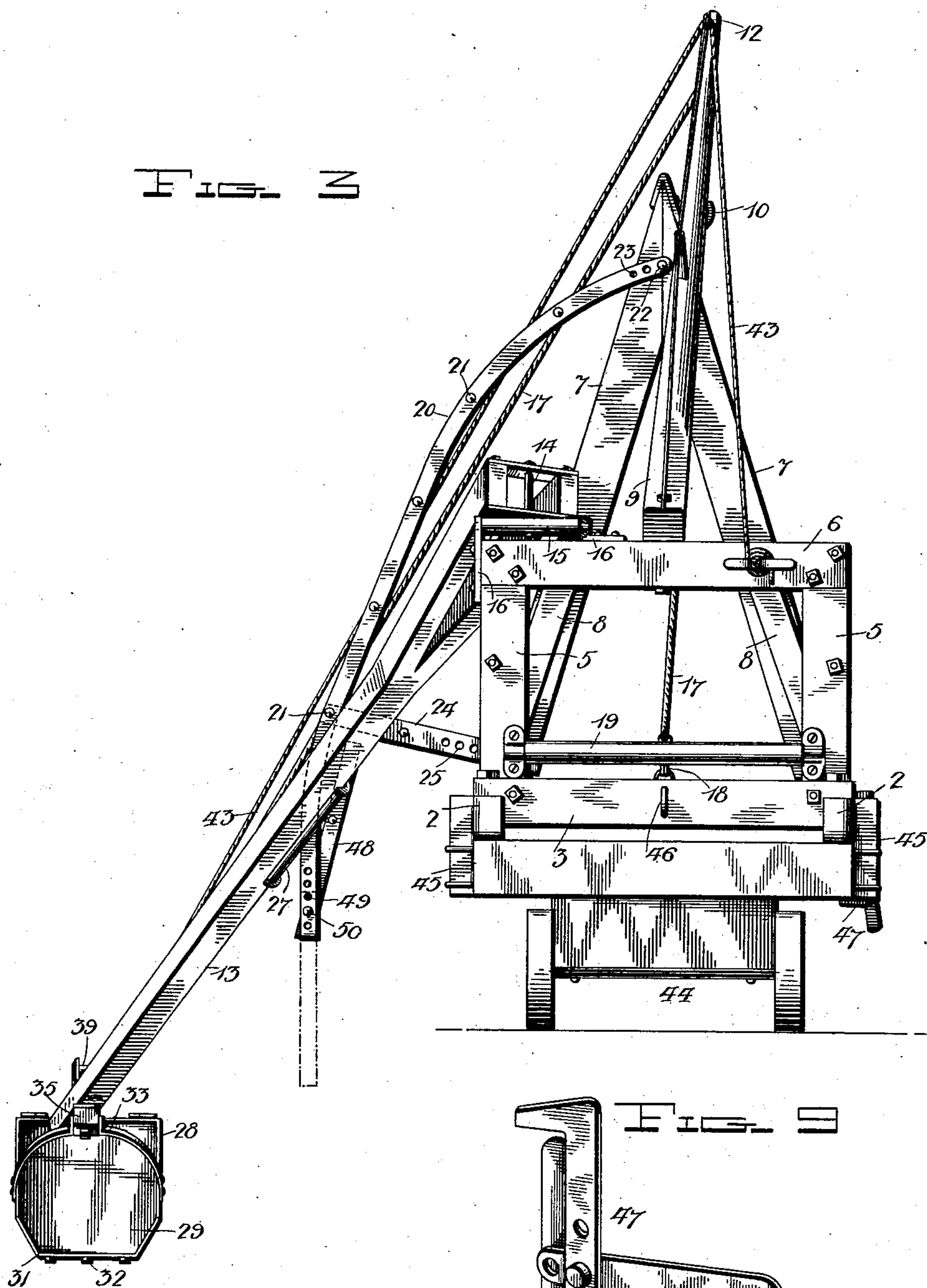
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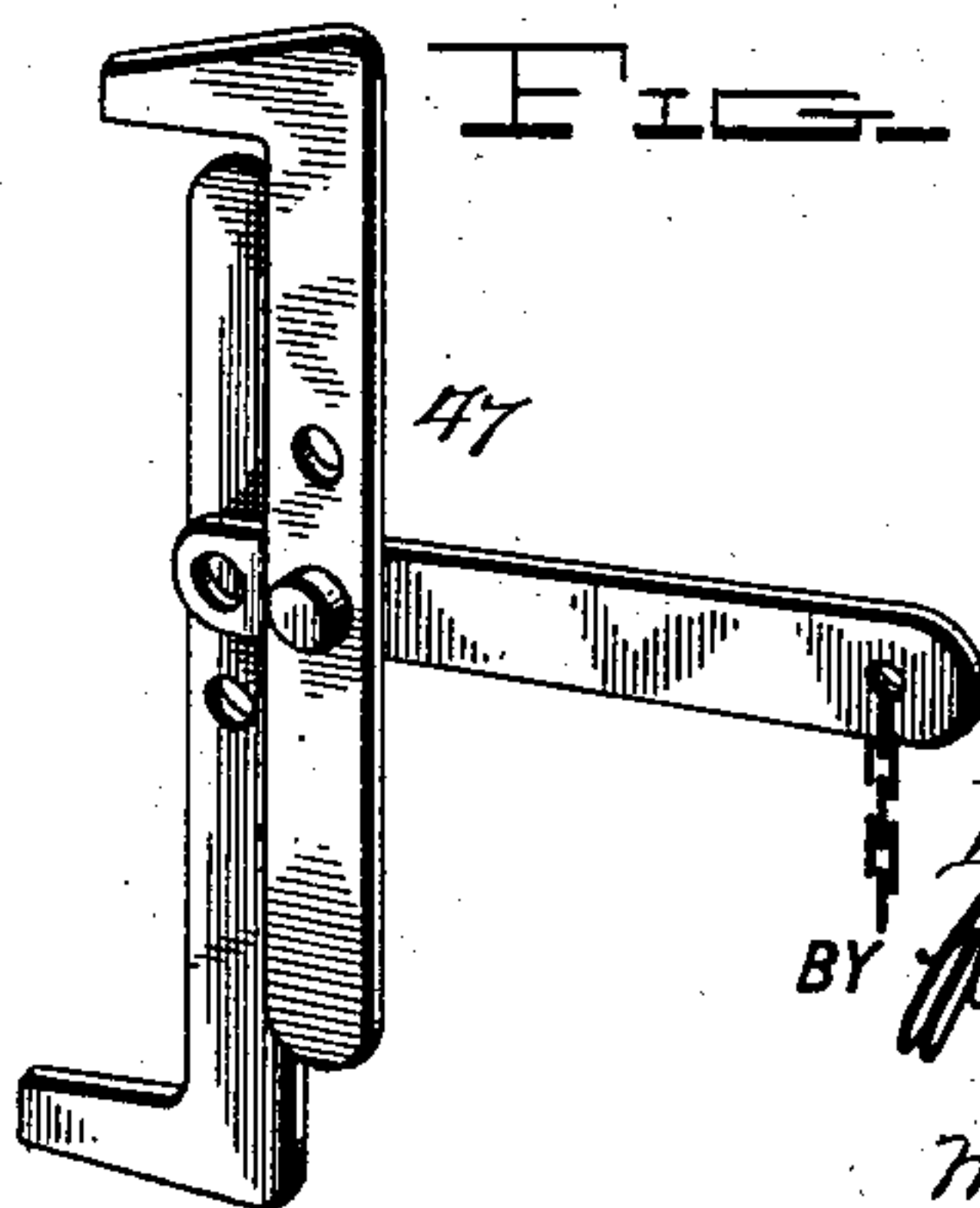
FIG. 3



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FIG. 4



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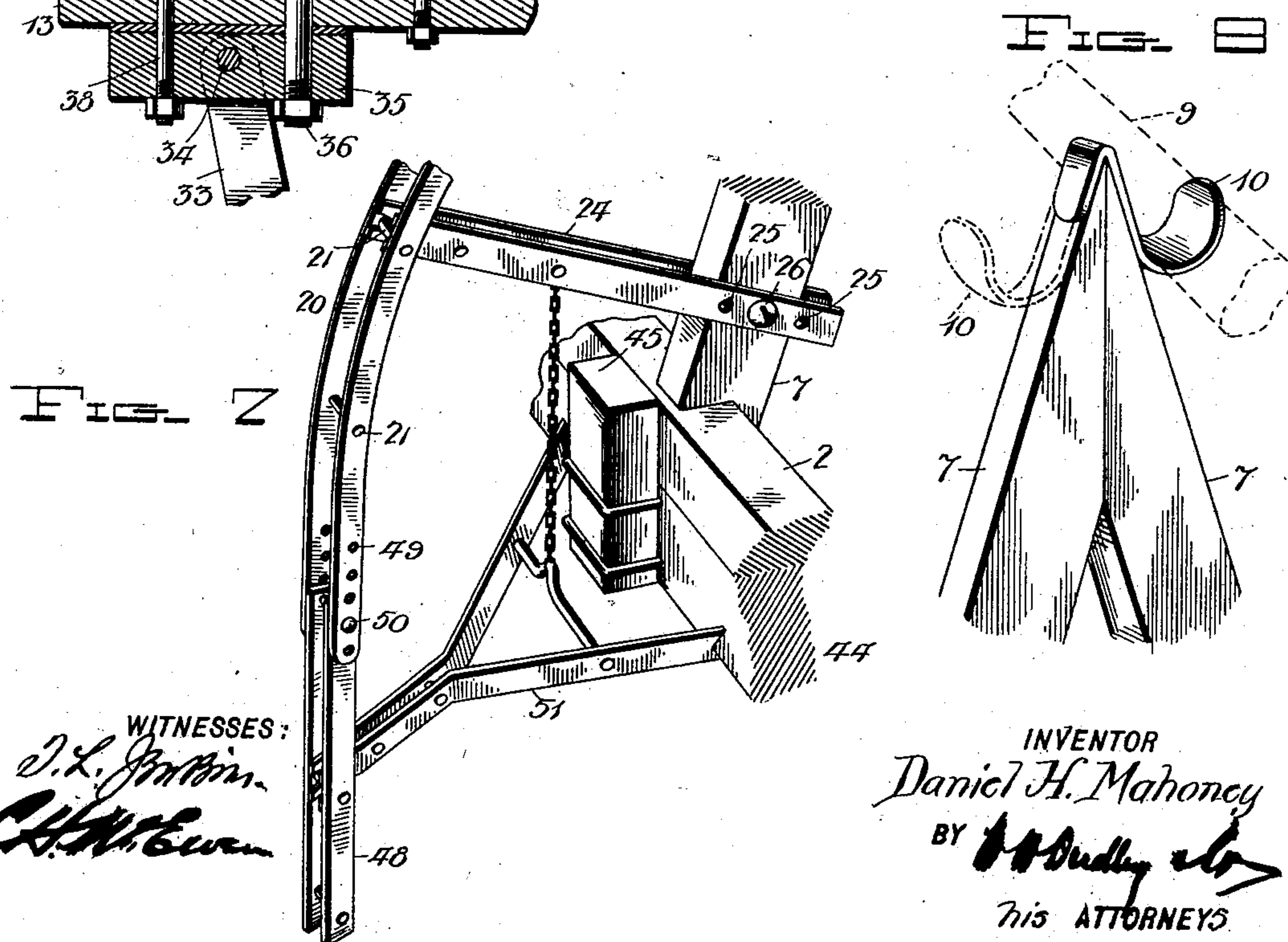
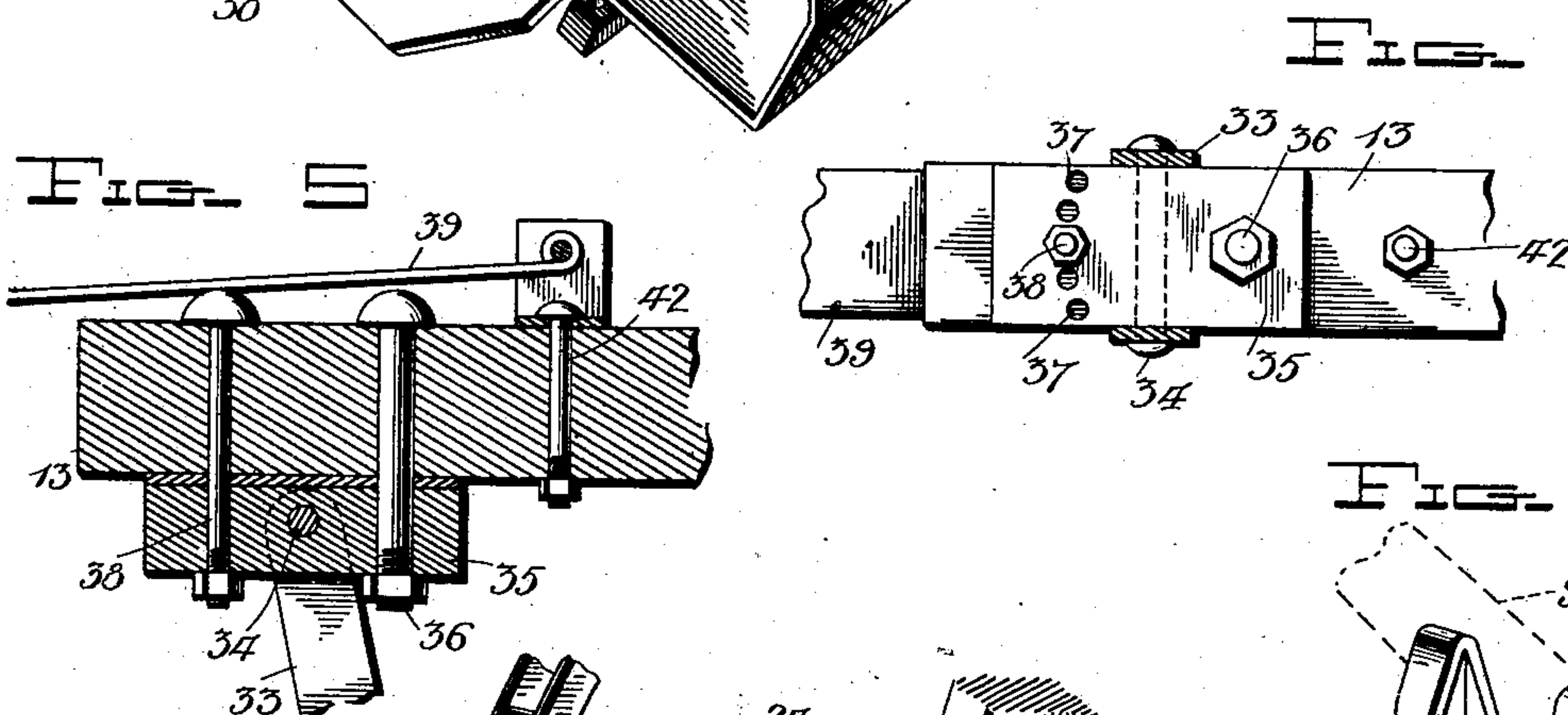
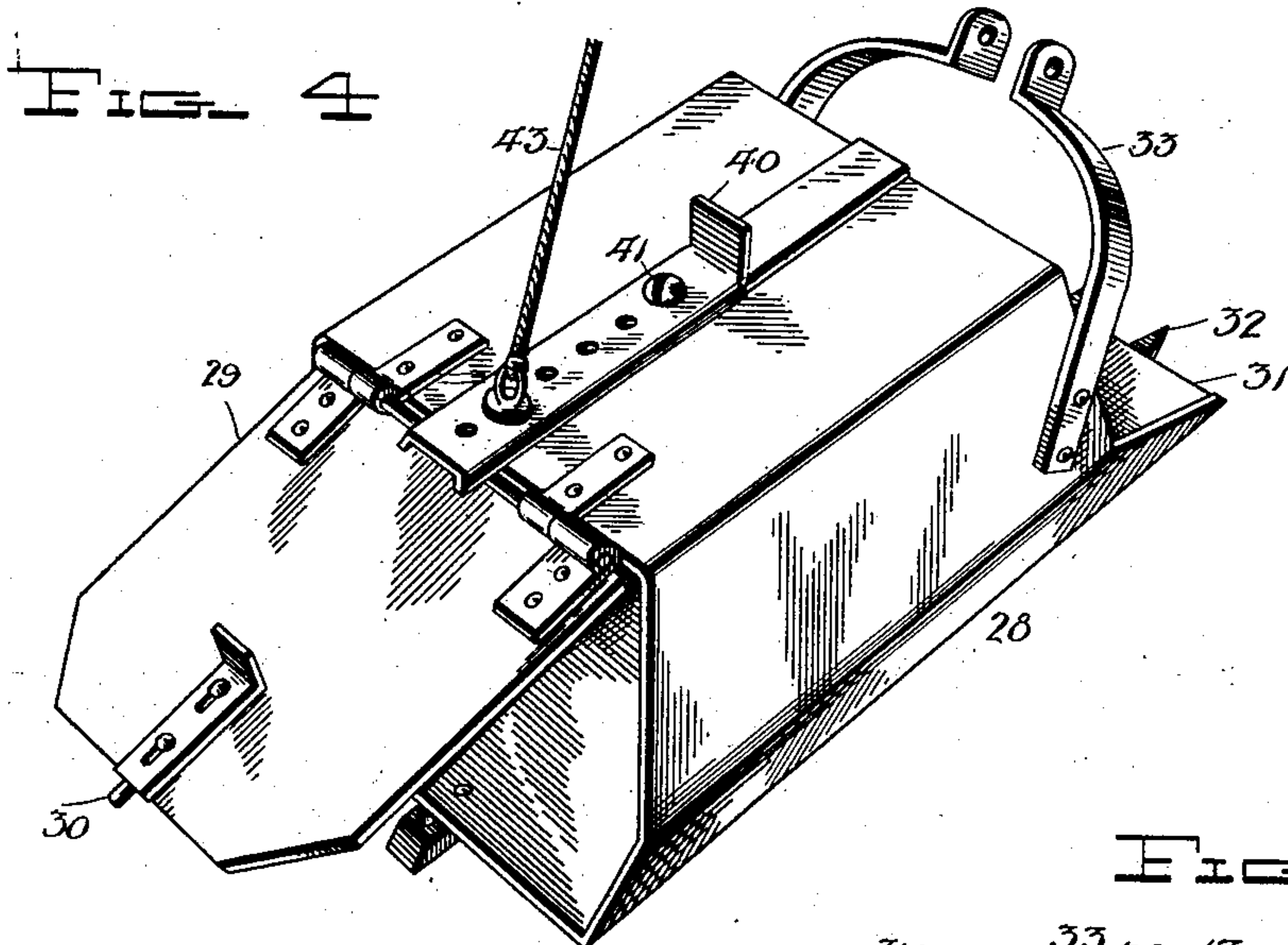
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

DANIEL H. MAHONEY, OF VINCENNES, INDIANA.

EXCAVATING AND LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 701,593, dated June 3, 1902.

Application filed September 5, 1901. Serial No. 74,358. (No model.)

To all whom it may concern:

Be it known that I, DANIEL H. MAHONEY, a citizen of the United States, residing at Vincennes, in the county of Knox and State of Indiana, have invented certain new and useful Improvements in Excavating and Loading Machines; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved machine designed more especially for use in connection with railroad-construction trains for the excavation and transportation of earth along the line of road; and the invention has for its object the production of a simple and durable appliance by the operation of which the construction of railroads and other works is greatly facilitated and is accomplished in an economic manner.

The nature of the invention will be readily comprehended, reference being had to the following detailed description and to the accompanying drawings, in which—

Figure 1 is a perspective view of an excavating and loading machine embodying the invention, the machine being shown movably supported on a train of railway flat-cars. Fig. 2 is a side elevation of the same, showing the scoop in elevated position to unload. Fig. 3 is a front elevation of the machine, showing the adjustment for deep cuts. Fig. 4 is an enlarged perspective view of the scoop. Figs. 5 and 6 are detail views showing the adjustable connection between the scoop and boom. Fig. 7 is a detail view showing the means for supporting the lower end of the boom-guide and the brace for the guide extension. Fig. 8 is a detail view of the upper end of the beam-support, showing the shiftable beam-hook. Fig. 9 is a detail view of one of the devices for clamping the machine-frame to the car.

Referring to the drawings by numerals, 1 denotes a carrier-frame comprised of side members 2 2 and end members 3 3, which members are firmly bolted or otherwise secured together and are braced by cross-pieces

4 4. The ends of the side members are rounded or beveled at their outer and lower sides and the end members are above the plane of the side members, whereby the latter form the support for the frame and parts carried thereby. Erected from the corners of the frame are four posts, two of which, 5 5, are connected at their upper ends by a cross-bar 6, and the other two, 7 7, are inclined inwardly and secured directly together. The posts are braced by inclined pieces 8 8.

9 is a beam, preferably of truss form, secured at its lower end by a swivel connection intermediately of the cross-bar 6. Between its ends the beam is supported on the posts 7 through the medium of a hook 10, which is shiftable, whereby the beam may be supported at either side of the post ends, as indicated in Fig. 8. At its upper or outer end the beam is provided with a pulley-block 11 and an eye or pulley-block 12, the purpose of which will be presently stated.

13 denotes a boom, the inner end of which is swiveled to the cross-bar 6. Said end is preferably widened and is pivotally secured by a bolt 14 to a roller 15, rotatably mounted at its ends in bearings 16 16. The boom end has at its under side a wear-plate which contacts with the surface of the roller and prevents the boom from turning; but through the described connection the boom is permitted both a vertical and a horizontal movement, and hence may be raised and lowered in an inclined plane. Attached to the outer end of the boom is a cable 17, which is passed around the pulley 11, and thence around a pulley 18 on the frame, and finally is secured to the drum of a hoisting-engine. (Not shown.) The cable preferably passes over a roller 19 at the opposite end of the carrier-frame.

Secured to one of the posts 7 is an inclined guide or fender 20, consisting, preferably, of two bars secured at intervals in separated relation by bolts 21 or the like. The guide is adjustably connected toward its upper end to the top of the post 7 by means of a bolt 22, which is passed through the post and through one of a series of holes 23 in the guide. Toward its lower end the guide is supported away from the post by a brace 24, consisting of two connected bars having notches at their ends to engage one of the bolts 21 of the guide

and having toward their inner ends a series of holes 25, through which and the post is passed a bolt 26. The boom is directed in its movements by the guide, with which it is in sliding contact, and to reduce friction and lessen wear a roller 27 is interposed between the guide and boom, the roller being carried by the latter.

The boom carries at its outer or free end a scoop 28 of rectangular form, but having its lower portion preferably conforming to the shape of the ditch or other excavation to be made. The scoop is open at its front end, and its rear end is normally closed by a dumping-door 29, which is hinged at its upper edge to the scoop-body and has a self-locking catch 30, moved by hand either directly or through a cord to release the door and permit the discharge of the load. The bottom of the scoop is extended at its front edge 31 and sharpened to enter the ground, and in connection with said front edge are a number of plow-points 32. The scoop has at its front a bail 33, which is pivoted by a bolt 34 to a block 35, secured to the under side of the outer end of the boom. In the lowered position of the boom the scoop is at one side of the carrier, and the distance of the line of traverse of the scoop from the carrier being variable, through the adjustment of the brace 24, to make the cut wherever desired the connection between the boom and scoop is made adjustable to bring the scoop into parallelism with such traverse despite the variation in the throw of the boom. To this end the block 35 is pivoted at one end by a bolt 36 to the boom, and at its other end are holes 37, through any one of which and the boom is passed an adjusting-bolt 38, whereby the scoop may be secured at the proper angle to the boom to bring the lowered scoop into exact parallelism with its line of traverse. To prevent the scoop during excavating from tilting, there is provided on the boom an arm 39, which engages an adjustable stop or shoulder 40 on the top of the scoop. The stop 40 is provided with a series of holes, through which and the scoop-top is passed a bolt 41 to effect the adjustment, and for the purpose of bringing the arm 39 into proper engagement with the stop despite variation in the angle between the scoop and boom the arm is pivoted on a bolt 42, which is tightened when the arm is moved to its proper position. A cord or cable 43 is secured at one end to the rear end of the scoop and is passed through the eye 12 on the beam and then fastened to permit of adjustment, preferably, on the cross-bar 6.

Although the machine is capable of utilization in excavations generally, it is designed more especially, as before stated, for use in railroad-building, and in the drawings the machine is shown as supported upon and movable along a train composed of flat-cars 44 44. The side frame members of the carrier serve as runners, whereby the machine may be drawn over the cars, being guided

by the stakes 45 45. In the preferred practice a hoisting-engine is carried by a car at the rear of the locomotive, and to the drum of the engine is secured the cable 17. The machine is first placed on the rear car and sufficiently forward thereof to enable the contents of the scoop to be dumped on the car. The boom being lowered to carry the scoop into excavating position, as shown in Fig. 1, the train is drawn by the locomotive to move the scoop, and when the latter is filled the train is stopped and the engine is then operated to raise the boom and scoop. In the upward movement the boom is guided by the inclined guide to bring the scoop directly over the longitudinal center of the car, and as in such movement the scoop is partly inverted the contents thereof are entirely discharged upon the opening of the scoop-door. In the return movement the scoop is carried to its lowered or excavating position beside the railroad-track and is righted by the cord or cable 43. As the car fills the machine is moved to a new position on the train by being drawn thereover, this being done, preferably, by the engine, a cable eye or hook 46 being provided on the front end of the carrier-frame for this purpose. After the entire number of cars have been loaded with earth the train is moved to the point where the filling is to be made and the unloading is then accomplished by the usual power-plow or in any other desirable way. During the operation of excavating the machine is secured in position on the car, preferably by the use of the clamps 47 47, which are placed at the side opposite that occupied by the boom and scoop. These clamps prevent longitudinal movement of the machine and also tilting, which might otherwise occur when the scoop is loaded. The beam, the guide, and the boom may be shifted to the opposite side should occasion demand, and, if desired, the entire machine may be reversed in position, in which event the movement of the train must also be reversed.

Attached to the lower end of the guide is an extension 48, similar in construction to the guide and adapted for use in making deep excavations. The lower end of the guide or the extension, as preferred, is provided with a series of holes 49, and 50 is a bolt which is passed therethrough and which serves to secure the extension adjustably to the guide. The lower end of the extension is supported by a brace 51, having sockets at one end to engage a bolt on the extension, and at the other end the bars of the brace are bent outwardly and are notched to engage one of the car-timbers. The extension when not in use is folded against the guide, as shown.

I claim as my invention—

1. An excavating and loading machine comprising a support, a boom, a scoop carried by the boom, means for raising and lowering the boom, and an inclined guide, separate from said means, for the movement of the boom.

2. An excavating and loading machine consisting of a carrier adapted to be drawn over a movable support, and means on the carrier for excavating at the side of the movable support and for loading the excavated material on the movable support, said means being propelled by the movement of the latter during the excavating operation.

3. An excavating and loading machine consisting of a carrier adapted to be supported on and to be drawn over a train of movable cars, a boom on the carrier, means for raising and lowering the boom in an inclined plane and a scoop carried by the boom.

4. An excavating and loading machine consisting of a carrier provided with runners, means for drawing the carrier along a train of movable cars, a scoop supported from the carrier to excavate by the movement of the train, and means for elevating the scoop to discharge on the cars.

5. In a machine of the class described, the combination of a support, a boom swiveled at one end thereto, a scoop carried by the boom, means for raising and lowering the boom, and an adjustable inclined guide for the movement of the boom.

6. In a machine of the class described, the combination of a support, a boom swiveled thereto, means for raising and lowering the boom, an adjustable inclined guide for the boom, and a scoop adjustably attached to the boom.

7. In a machine of the class described, the combination of a support, a boom swiveled thereto, means for raising and lowering the boom, an adjustable inclined guide for the boom, a block adjustably secured to the boom, and a scoop having a bail pivotally secured to said block.

8. In a machine of the class described, the combination of a support, a boom swiveled thereto, means for raising and lowering the boom, a guide for the boom, a scoop pivoted on the boom, and an adjustable arm on the boom engaging an adjustable stop on the

scoop to prevent tilting of the latter during excavating.

9. In a machine of the class described, the combination of a support, a boom swiveled thereto, means for raising and lowering the boom, a guide for the boom, a scoop pivoted at its open end to the boom, an adjustable arm on the boom engaging an adjustable stop on the scoop to prevent tilting of the latter during excavating, and a cord attached to the closed end of the scoop and adapted to right the latter at the end of its downward movement.

10. In a machine of the class described the combination of a support, a boom swiveled thereto, means for raising and lowering the boom, a scoop carried by the boom, an inclined guide for the movement of the boom, an extension adjustably secured to the guide, and a brace for the extension.

11. In a machine of the class described, the combination of a support, a boom swiveled thereto, means for raising and lowering the boom, a scoop carried by the boom, an inclined guide for the movement of the boom, and a roller on the boom contacting with the guide.

12. In a machine of the class described, the combination of a carrier adapted to be drawn along a movable support, a boom swiveled at one end thereto, a scoop carried by the boom, means for raising and lowering the boom, an inclined guide for the movement of the boom, and clamps for temporarily securing the carrier to the support.

13. In a machine of the class described, the combination of a carrier, an upright on the carrier, a scoop, a beam operatively connected with the scoop, and a shiftable support on the upright for the beam whereby the scoop may be used at either side of the carrier.

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

DANIEL H. MAHONEY.

Witnesses:

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A. BROWNING.