

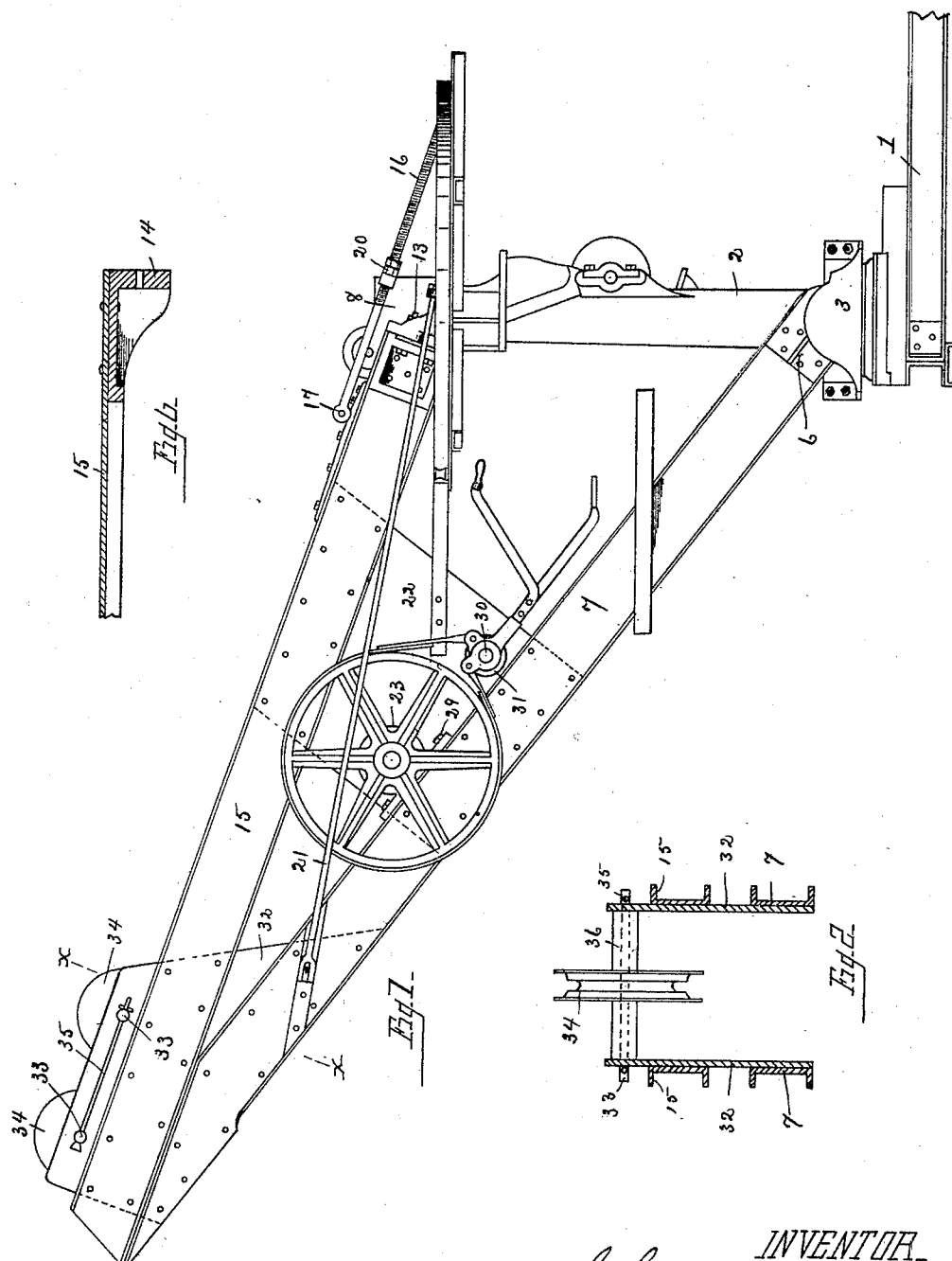
(No Model.)

2 Sheets—Sheet 1.

J. ZIEGLER.
EXCAVATOR AND WRECKER.

No. 465,037.

Patented Dec. 15, 1891.



WITNESSES

Carroll J. Webster
Mary A. Mathews.

INVENTOR

John Ziegler
By William Webster
Atty

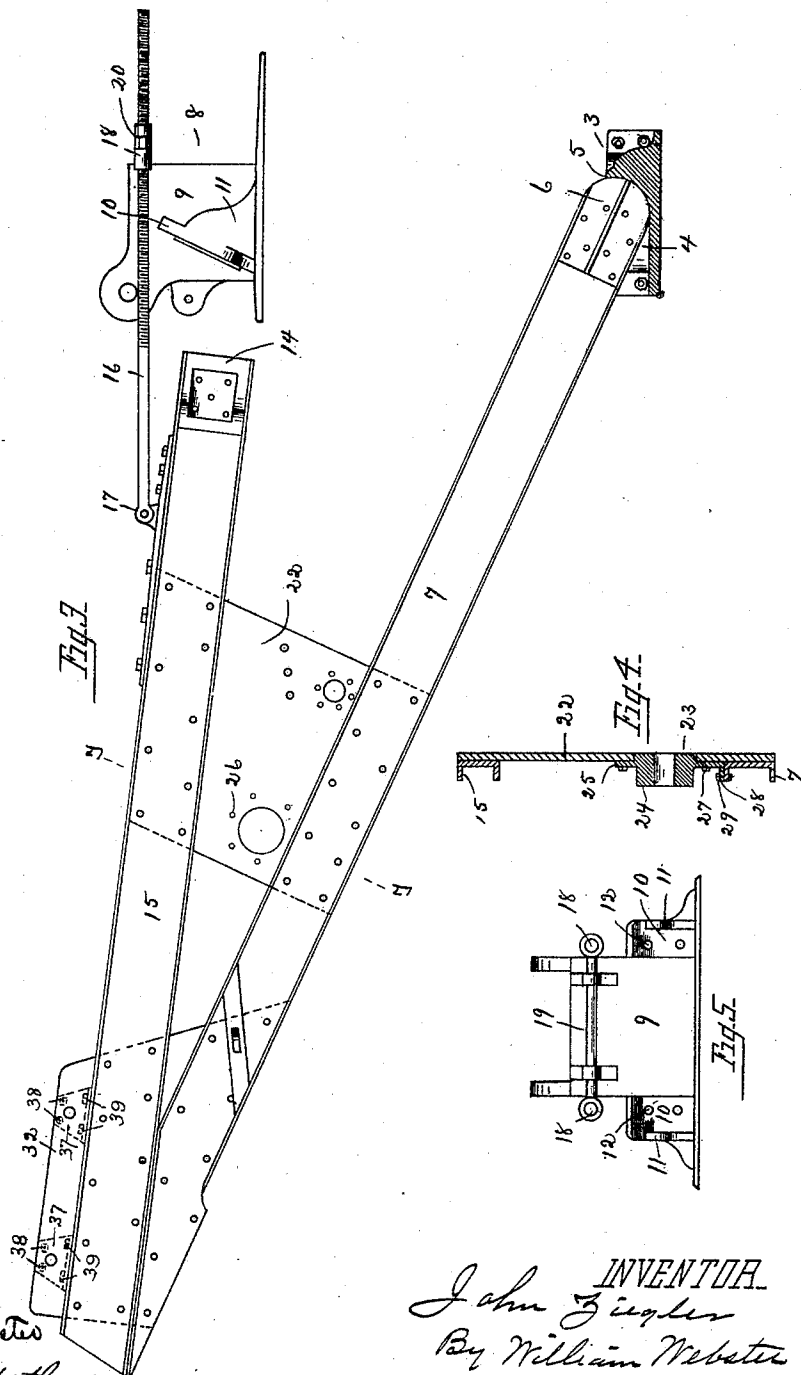
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UNITED STATES PATENT OFFICE.

JOHN ZIEGLER, OF TOLEDO, OHIO, ASSIGNOR TO THE VULCAN IRON WORKS COMPANY, OF SAME PLACE.

EXCAVATOR AND WRECKER.

SPECIFICATION forming part of Letters Patent No. 465,037, dated December 15, 1891.

Application filed May 12, 1891. Serial No. 392,471. (No model.)

To all whom it may concern:

Be it known that I, JOHN ZIEGLER, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in an Excavator and Wrecker; and I do hereby 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to an improvement in an excavator and wrecker, and has reference more especially to that class used in excavating for railroads or clearing wrecks upon the same.

The invention has for its object to provide for rigidity to the swinging crane at the point of bearing of the journals, whereby to cause the shafts to run true and without torsion.

A further object is to provide a solid boxing for the shafts and to secure the same in the crane at a point between the crane-arm and boom, thereby not only dispensing with a two-part or cap box, but obviating the necessity of securing the box directly to the boom.

A further object is to provide convenient means for lowering the crane to pass overhead obstructions and to raise the same to its normal height.

The invention consists in the parts and combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a sufficient portion of an excavator and wrecker constructed in accordance with my invention to illustrate the novel parts. Fig. 2 is a transverse view on lines *x x*, Fig. 1, showing the manner of securing the strengthening-plates and also the shaft journaled therein. Fig. 3 is a side elevation of the crane with the mast and brace-rods omitted, showing the crane partly lowered. Fig. 4 is a transverse sectional view of one side of the crane on lines *y y*, Fig. 3, showing the solid box and mode of securing the same to the plate. Fig. 5 is a rear elevation of the

mast-head, showing the duplex eye-rod through which the lowering rods pass journaled thereto. Fig. 6 is a detail sectional view of a portion of the boom and side plate.

1 designates the car-platform into which the mast 2 is stepped, there being a base-casting 3 secured to the mast immediately above the car-platform, the casting having a vertical recess 4 formed therein with a curved rear wall 5, against which the rounded end 6 of a brace 7 rests, thereby allowing the same to have a pivotal movement when raising or lowering the crane.

At the upper end of the mast there is secured a head 8, upon which is secured a chain circle, by which to cause the crane to revolve through the medium of a chain passing around the same, and drums upon the excavator. As this mechanism forms no part of my invention, I have deemed it unnecessary to illustrate the chain or actuating mechanism. Head 8 is formed with a solid rectangular body 9 and side flanges 10, strongly re-enforced by rearwardly-projecting angles 11, the flanges being perforated at 12 to receive bolts 13, which pass through the same and also through the metal side pieces 14, secured to the boom 15 of the crane, whereby the boom is securely held to the mast-head or adapted to be released therefrom when it is desired to lower the crane, as will be hereinafter described.

The crane is composed of the booms 15 and the braces 7, there being a boom and brace upon each side of the mast, both of which are formed of channel-iron of the desired strength to stand the great weight to be sustained by the crane.

In order to be enabled to lower the crane to allow the same to pass beneath the roof-timbers of bridges or other obstructions when at its normal height, I have provided a lowering mechanism comprising two threaded rods 16, one upon each boom-iron, pivotally secured to the same at 17 and extending rearwardly of the mast-head, passing through eyes 18 of a transverse bar 19, revolvably secured at the rear of body 9, there being nuts 20 screwed upon the rods, by which means by unscrewing the nuts upon bolts 13, loosening brace-rods 21, secured to the mast-head and braces

7, and unscrewing nuts 20 upon rods 16, the mast can be lowered to any desired degree and raised again, when desired, by screwing up nuts 20 upon rods 16, the bar 19 turning to allow the rods to assume any desired angle to the mast.

Heretofore the shipper-shaft, as well as the brake-lever shaft, and also the chain-wheel shafts, have been journaled in boxes secured directly upon the brace 7 and the boom, respectively. In the case of the shipper-shaft, whereon great strain is exerted, there has been great difficulty experienced by reason of the spring of the brace, thereby causing the shaft to have a torsional bearing.

Another difficulty has been in the necessity of drilling several holes through the brace to allow of the use of a number of bolts in order to hold the boxing in place, thereby weakening the brace, and a further difficulty has been experienced of using a two-part box, it having been found practically impossible to secure the cap to the body of the box by means of bolts, so that it would stand the great strain incident thereto. I have overcome these difficulties by securing a plate of sheet metal 22, preferably of boiler-iron, to each beam 15 and brace 7 of the crane, thereby forming not only a strong support for each boom and brace, but providing a web in which the boxings 23 for the shipper-wheel shaft may be secured, by this means avoiding the necessity of employing a great number of bolts engaging with the brace and the consequent number of holes through the same to hold the box, and also uniting the combined strength and rigidity of the crane-bars in supporting the box.

Boxes 23 are formed with a solid encircling wall 24, through which is the opening 24' for the shaft, there being an annular flange 25 surrounding the wall 24, through which perforations are made to register with coincident perforations 26 in plates 22, by which means the box may be securely held in the plate by bolts 27.

The lower portion of flange 25 is formed with an angled base 28 to coincide with the angle of brace 7, and is secured to the brace by bolts 29, passed through perforations formed in each angle, the two bolts being all that is necessary at this point, in view of fastening of the box to the plate.

The brake-lever shaft 30 is journaled in boxes 31, substantially such as has been described, and is secured in the plate 22 by means of bolts passed through the flange and plate, thereby obviating the necessity of weakening the brace by bolt-holes, as has been necessary heretofore.

In order to further strengthen the end of the crane, I secure a plate 32 to each boom and brace by means of bolts passed through each, respectively, and secure the journals of the chain-wheel shafts 33 therein.

Heretofore the chain wheels 34 have been secured upon the shafts 33 and the shafts

journaled in boxes secured upon the booms 15. This has not only caused a torsional bearing due to the unequal spring of the booms, but has caused rapid wear of the journals on account of the small bearing-surface longitudinally thereof. To overcome this difficulty I secure the journals in the plate and prevent the rotation thereof by means of a rod 35 passed through a perforation formed in the outer end of each, thereby holding the journals immovable, and to obviate the rapid wear, as well as to cause the wheels to true axially, I form wheels 34 with elongated bearings 36 and allow the wheel and bearings to revolve upon the journals.

It will be seen from the foregoing that the crane is given the greatest degree of rigidity to prevent spring and that the bearings are so arranged with relation thereto that the journals will run true irrespective of the load sustained.

In constructing cranes for the heaviest work I supplement the plates 32 with additional strengthening-plates 37, (shown in the dotted lines, Fig. 3,) these plates being secured to the plate 32 by means of bolts 38, and to the upper angle of the boom by bolts 39, passed through the angled portion of the plate, and through the angle of the boom, the plates being perforated coincidentally with the perforation in plates 32 to receive the shafts upon which the chain wheel runs, thereby effectually preventing the plates 32 from buckling or bending.

What I claim is—

1. In an excavator and wrecker, a mast, a boom, screw-rods pivotally secured to said boom, nuts for adjusting the rods to the mast, and braces secured to the boom and pivotally connected with the mast.

2. In an excavator and wrecker, a mast provided with a channeled base-plate and a head, a crane-arm comprising boom-bars and braces secured thereto, the latter being stepped into the channels of the base-plate, rods pivotally secured upon the boom-bars and having threaded ends extending rearwardly of the mast-head, a bar journaled upon the rear side of the mast-head, having eyes through which the threaded ends of the rods pass, and nuts upon the rods which bear upon the bar, whereby the crane may be raised or lowered.

3. In an excavator and wrecker, a crane comprising boom-bars and brace-bars, and a plate secured to and overlapping each boom and brace, respectively, intermediate their lengths, and formed with openings to receive journal-boxes.

4. In an excavator and wrecker, a crane comprising boom-bars and brace-bars, a plate secured to and overlapping each boom and brace bar, respectively, and boxes secured in the plates, each box being formed with a solid annular wall, thereby forming a boxing for the shipper-shaft.

5. In an excavator and wrecker, a crane,

metal plates secured at the end thereof, extending from the boom to the brace and secured to each, parallel shafts secured in the plates and held from revolution, and a chain
5 wheel loosely mounted upon each shaft, each wheel being formed with an elongated hub which runs upon the shaft.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

JOHN ZIEGLER.

Witnesses:

WILLIAM WEBSTER,
DAVID C. WALTER.