R. E. MURPHY.

PILE DRIVER.

APPLICATION FILED JAN. 22, 1908.

915,788. Patented Mar. 23, 1909.

Fig. 1.

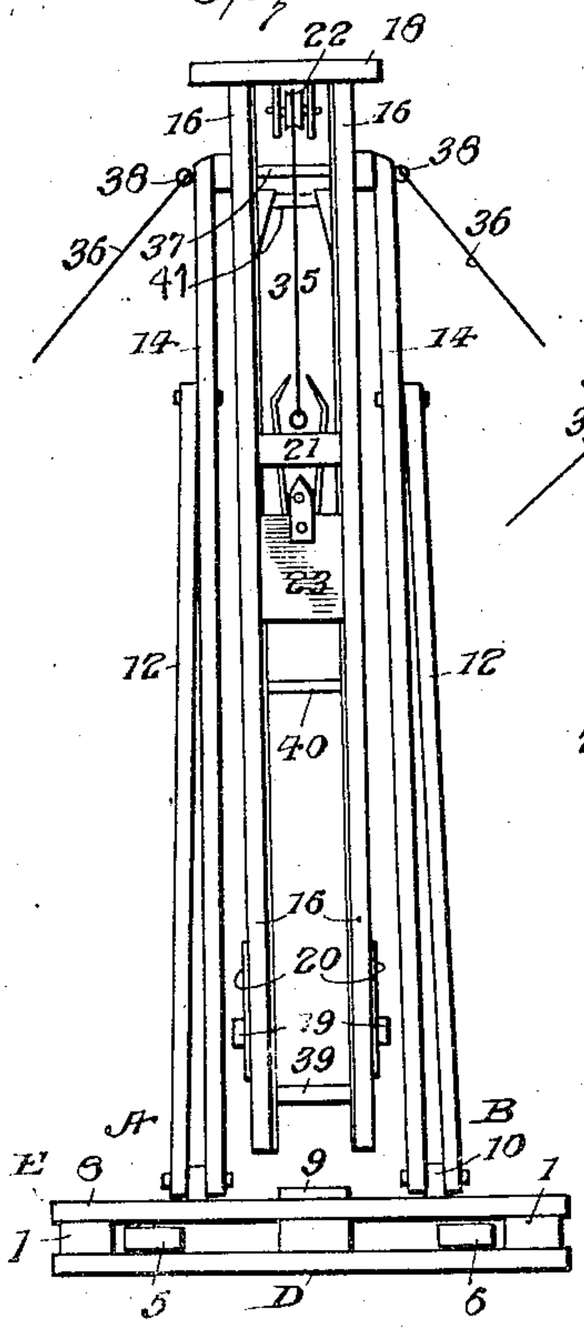



Fig. 2.

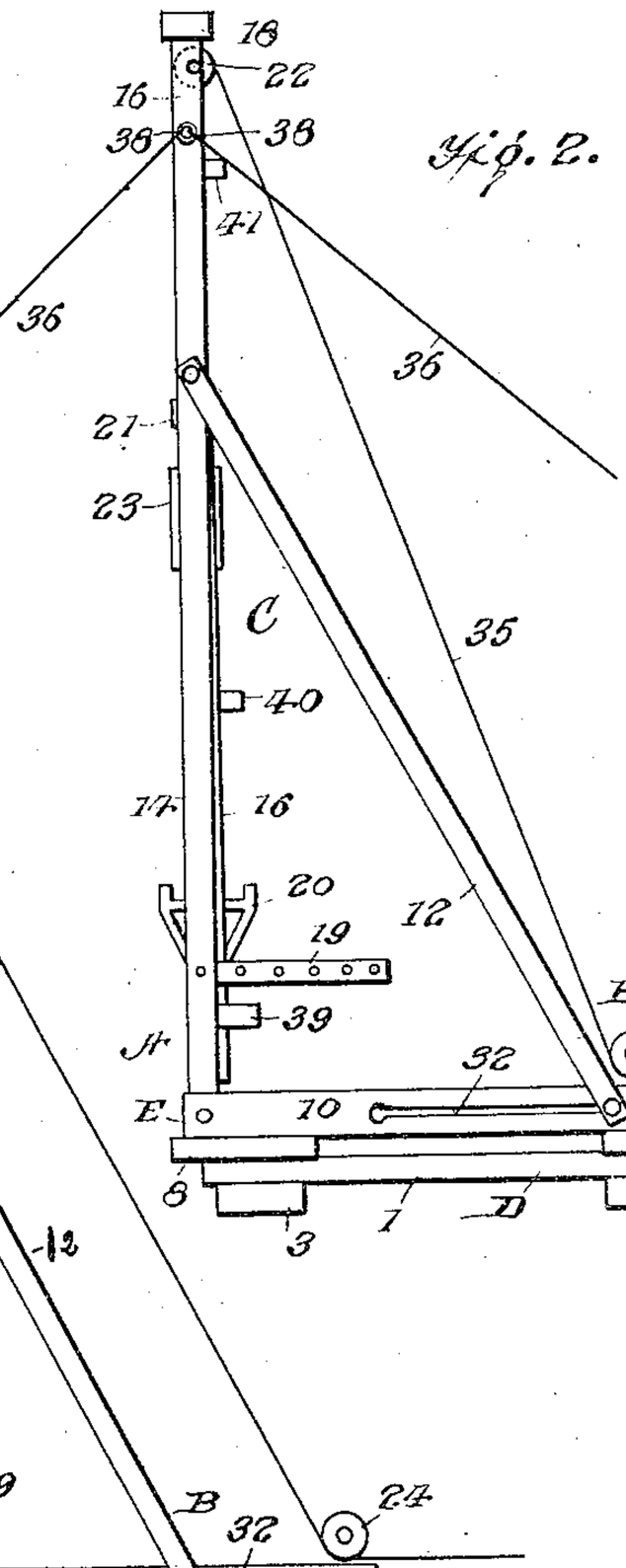



Fig. 3.




Fig. 5.

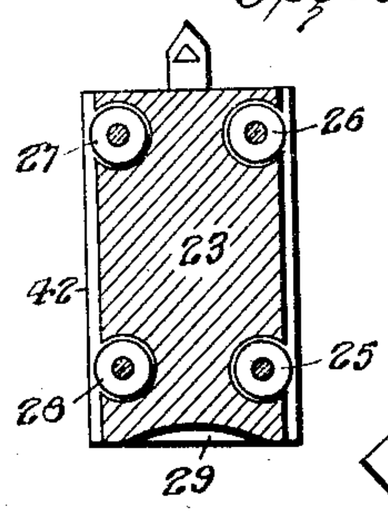
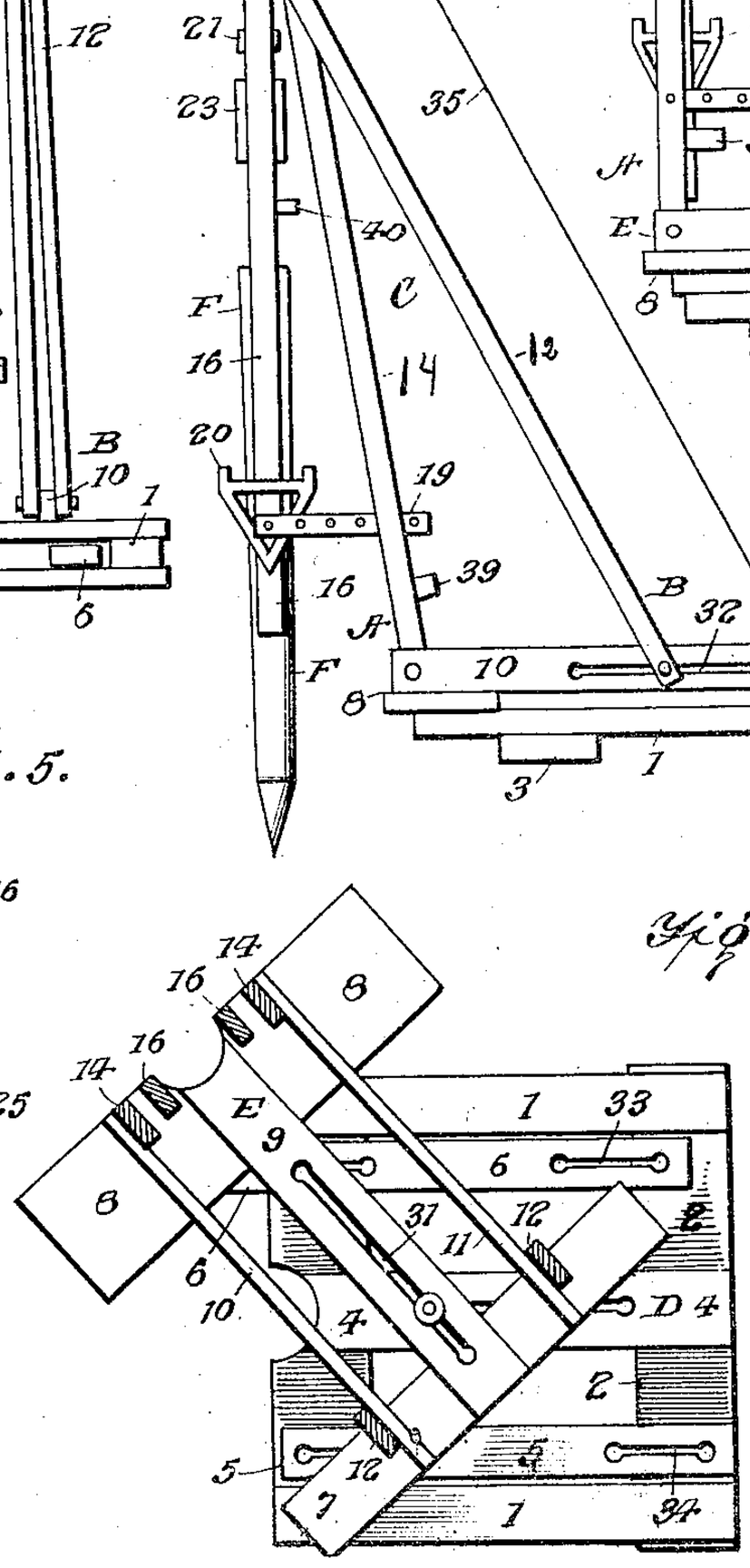



Fig. 4.

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## PILE-DRIVER.

No. 915,788. Specification of Letters Patent. Patented March 23, 1909.

Application filed January 22, 1908. Serial No. 412,123.

*To all whom it may concern:*

Be it known that I, ROY EMRY MURPHY, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented a new and useful Pile-Driving Machine, of which the following is a specification.

My invention relates to improvements in pile drivers in which an adjustable derrick is made to be moved from the perpendicular, and supports by a hinge joint the guide frame and bars of the drop hammer, so as to allow the guide frame for the hammer to be projected from the base or carriage of the machine and rigidly made to remain where adjusted, and having a frame upon which the said derrick and guide frame may be moved to the right or left and forward or backward, from the carriage or bed upon which the driver is resting, simply and without impairing the efficiency of the machine. I attain these objects by means of the mechanism illustrated in the accompanying drawing, in which:—

Figure 1, is a vertical front view of the entire machine; Fig. 2, is a vertical side view, of the entire machine with the guide frame vertical and parallel with the derrick; Fig. 3, is a side view of the entire machine like Fig. 2, except that the derrick is projected forward extending the guide frame from the derrick; Fig. 4, is a top view of the base of the machine with the superstructure removed to show the two horizontal frames below; and Fig. 5 is a vertical sectional view of the hammer, taken in a plane at right angles to the guide bars, showing the anti-friction rollers.

Similar letters and figures refer to similar parts throughout the several views.

The two horizontal frames D, and E, the derrick C, the guide frame and the hammer, constitute the principal parts of my invention.

The horizontal frame D, consists of a square frame of boards or planks rigidly fastened together, and having sliding boards 5, and 6, made adjustable on said frame D, so as to project forward as desired by the operator. The horizontal frame E, is similar to horizontal frame D, and adjustable upon it both laterally and pivotally as shown in Fig. 4.

The derrick C consists of the two upright posts 14, 14, and the braces 12, 12, mounted upon movable frame E, and bolted adjustably to fore and aft joists 10, and 11, and with the braces 12, 12, fitted by means of clamp bolts to slots 32, and 32, so that they may be moved forward or backward to adjust the position of the top of the derrick at the long hinge-bar 37, as shown in the two positions in Fig. 3, and Fig. 2. When horizontal frame E, is moved directly forward on horizontal frame D, the clamp bolt in slots 30, and 31, is made to slide therein until the proper position is attained and then clamped tightly so as to hold horizontal frame E, rigidly in position with horizontal frame D, and sliding bars 5, and 6, are shoved forward under front cross board 8, to assist in sustaining the weight of the derrick C, and the guide frame, as shown in Fig. 3.

The horizontal frame E, has a pivotal motion on horizontal frame D, as shown in Fig. 4, in which case right sliding board 6, is shoved forward under front cross board 8, which would carry the guide bars 16, 16, forward and to the right of the front of horizontal frame D. This would be the position assumed in driving piles or posts to the right of a line, and the frame E would be turned to the left to a point over the front end of the left sliding board 5, in driving a pile or post at the left end of the line, in which case left sliding board 5, would be projected forward in a similar manner to that occupied by right sliding board 6, in Fig. 4. The fore and aft motions and the pivotal motions to right and left of horizontal frame E, on horizontal frame D, are for the purpose of adjusting the guide bars 16, 16, carrying the hammer 23, over the different points in which piles or posts are to be driven. An additional motion for adjusting the position of the guide bars 16, 16, is attained by sliding the bottom end of braces 12, 12, by means of the clamp bolts in the slots 32, 32, for the purpose of a fore and aft adjustment of the pile or post and the hammer 23.

The horizontal platform D, may be mounted upon a foundation of posts or sills or other suitable framework or upon a carriage as a wagon or a railroad car. When the bottom end of braces 12, 12, are adjusted so as to cause the guide bars 16, 16, to swing forward from posts 14, 14, the guide bars 16, 16, may be maintained rigid with posts 14, 14, by means of iron stays 19, 19, which are

bolted at one end to guide bars 16, 16, and are fastened by means of pins or bolts to the inner surface of posts 14, 14. thus preventing a vibrating motion of guide bars 16, 16.

For the triangular brackets 20, 20; the grapple-block 21; the hammer-hoisting rope 35, 35; the pulleys 22 and 24, I claim no novelty whatever.

The long hinge-bar 37, passes through the top end of upright posts 14, 14, of the derrick C, and through upright guide bars 16, 16, near their upper end and below pulley wheel 22, thus allowing said upright guide bars to swing with a hinged motion suspended from the top of the upright posts 14, 14, so that said guide bars will assume a vertical position when released by iron stays 19, 19, and without the necessity of adjusting them to a level or plumb, thus facilitating the adjustment of the pile or post to be driven when suspended between the guide bars and beneath the hammer. The guide bars 16, 16, are secured equidistant from each other at all points by means of iron brackets 40, and 41, and head beam 18. The iron brackets 39, and 40, are also useful in holding in position the pile or post F, before it is completely driven.

The hammer 23 is a solid mass of metal made to rise and drop between the upright guide bars 16, 16, and is provided with flanges 42, and 42, to keep it between said upright guide bars 16, 16. It is also provided with anti-friction rollers 25, 26, 27, and 28, as shown in Fig. 5, which are intended to avoid any rasping or scraping of the hammer 23 against the sides of the upright guide bars 16, 16, when the hammer is being raised or when it is released or drops upon the pile or post. These anti-friction rollers are very useful when the iron facings on the inner surface of upright guide bars 16, 16, are made of more than one piece each and the joints project one past the other at the ends or the track becomes rough or splintered. The bottom end or striking face of the hammer 23, is slightly concave for the purpose of receiving the central part of the top end or head of the pile or post F, with the view to prevent the hammer from glancing or the top or head of the pile or post F, from splitting or being thrown out of line.

I am aware that prior to my invention pile drivers have been made with guide bars in which a drop hammer was made to work for driving piles or posts and that said guide bars have been adjustable upon the frame or carriage supporting them. I therefore do not claim such a combination broadly; but

I claim:

1. In a pile driver, two horizontally arranged base frames, the upper one fitted to slide both laterally and forward and back upon the lower one, and the lower one provided with supporting arms, and means for clamping said base frames rigidly together, all substantially as described.

2. In a pile driver, a horizontal frame or base upon which is a similar frame fastened to it by means of clamping screw bolts passing through timbers of the two frames and adjustable in slots in the timbers, of the two frames, the top frame carrying a derrick adjustable from the perpendicular to the said frame by means of braces adjustable at their bottom end and held by clamping screw-bolts sliding in slots in timbers of the said top frame, said derrick having hinged at its top the upright guide bars between which the hammer of the driver moves, all substantially as set forth and for the purposes specified.

ROY EMRY MURPHY.

Witnesses:
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