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W. M. MITCHELL

PORTABLE CRANE

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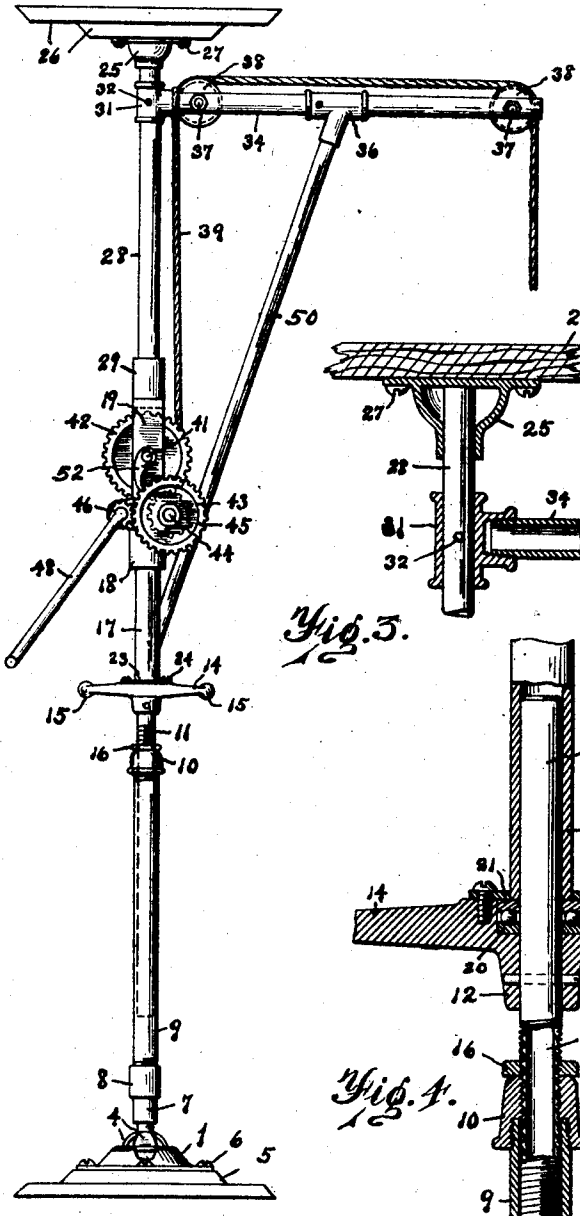


Fig. 1.

Fig. 3.

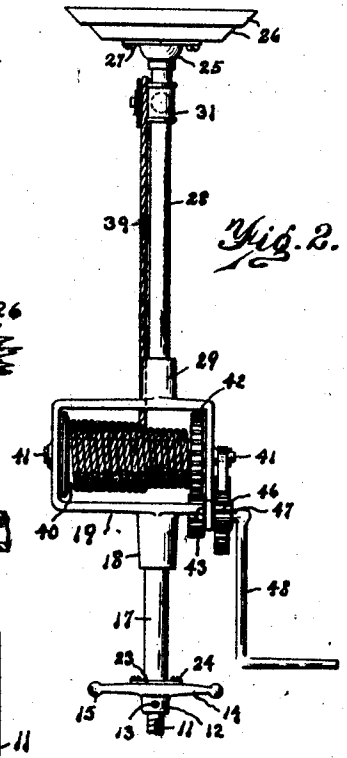


Fig. 2.

Fig. 4.

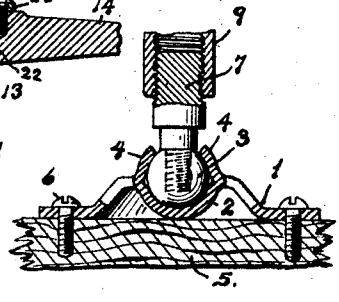


Fig. 5.

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PORTABLE CRANE.

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This invention relates to a light portable crane made up of a plurality of parts so that it can be readily transported and assembled at the place where it is to be used, and its object is to provide a device of this character whose parts can be carried and assembled by one man, which will have a mast that can be adjusted for length and have contact plates at its ends to engage the floors and ceilings of the rooms wherein it is to be used to hold the crane in upright position, and which can be built at low cost.

Plumbers and steam-fitters are often called upon to move, erect or connect parts of heating furnaces, radiators, tanks and other loads in basements and other parts of dwellings with no facilities for handling such weights. The crane shown in the drawing is designed to be adjustable as to height so that the contact plates at the ends of the mast can engage the floors and ceilings of the rooms wherein the work is to be done; it is designed to permit one man to easily raise the loads which must usually be taken care of in such work; and it is designed to be separated into parts which are sufficiently light to be easily carried by one man to the places where it is to be used.

In the accompanying drawing, Fig. 1 is a side elevation of this portable crane. Fig. 2 is a front elevation of the upper portion thereof. Fig. 3 is a vertical section of the upper support. Fig. 4 is a vertical section of the means for adjusting the height of the crane. Fig. 5 is a vertical section of the foot.

Similar reference characters refer to like parts throughout the several views.

The crane shown in the drawing is made of two detachable parts, the lower part being adjustable as to length or height and the upper portion embodying the working mechanism or crane proper. The lower portion consists of a base plate 1 provided with a spherical seat 2 for the ball 3 which may be held in position by means of the fingers 4 which are bent toward each other after the ball is positioned. The base 1 may be secured to the foot boards 5 by means of the screws 6. The connection between this lower contact plate and the lower end of the mast is therefore a universal joint. Extending up from the ball 3 is a threaded pin 7 which screws into a regular pipe coupling 8 which receives the upright pipe 9 which may be of any desired length and constitutes a portion of the mast of the crane.

The crane is intended for use in rooms of different heights of ceilings and the pipe 9 is therefore made sufficiently short to accommodate this crane to even the lowest ceilings. Where additional height of mast is found necessary, the pin 7 may be unscrewed from the coupling 8 and another coupling and short piece of pipe may be inserted between this pin 7 and the pipe 9. While the drawing shows the pin 7 to be solid, it is evident that it may be replaced by means of an ordinary pipe nipple.

Screwed onto the upper end of the pipe 9 is a reducing coupling 10 which fits the threaded member 11 of the mast of the crane, which member may be of any desired length, and while it is shown to be a pipe in Fig. 4, it may be solid. A hub 12 is secured to this member 11 by means of a pin 13 and arms 14 with knobs 15 at their ends extend from this hub 12, and by means of these arms the part 11 may be turned to lift the hub 12 to any desired height above the base plate 1. When the desired height is obtained, the lock nut 16 may be screwed down tight to lock the member 11 to the upright pipe 9. The member 11 extends up into the pipe 17 which extends down from the hub 18 of the frame 19 shown in Figs. 1 and 2, and also constitutes a portion of the mast.

Mounted in the hub 12 are the two bearing rings 20 and 21 between which are the bearing balls 22 and a retainer 23 may be secured to the hub by means of the screws 24 to hold this bearing in position. The lower end of the pipe 17 rests on this step bearing which permits the upper portion of the crane to turn freely on the lower portion.

The socket 25, shown in Fig. 3, is attached to the contact boards or plates 26 by means of screws 27 and the upper member 28 of the mast is rotatable in this socket. Its lower end connects into the hub 29 in the frame 18. This upper pipe 28 extends through the T 31 and is secured therein in any desired manner, a pin 32 being shown. Extending from this T 31 is a boom composed of a pipe 34 extending through a T 36 and pinned thereto. This boom carries the pins 37 on

which are mounted the rope sheaves 38 over which the rope 39 runs from the article to be lifted to the rope drum 40 connected to a shaft 41 mounted in the frame 18. Connected to this shaft 41 is a gear wheel 42 which meshes with a pinion 43 attached to a small shaft 44 also rotatable in the frame 18. On the outer end of this shaft 44 is a gear 45 which meshes with a pinion 46 on the shaft 47 to which the handle 48 is attached. This frame 18 and the mechanism mounted therein may be termed a windlass. The strut 50 extends down from the T 36 to the pipe 17 and is connected thereto in any desired manner.

When the parts are assembled as shown in Fig. 1, the workman releases the lock nut 16 and turns the hub 12 and the rod 11 by means of the arms 14 until the upper contact plate is pressed against the ceiling by means of the pipe 28 which holds the mast of the crane vertical. As the lower contact plate is connected to the mast by means of a ball bearing, it can readily accommodate itself to any unevenness of the floor. The pawl 52 will hold the load when elevated and permit the workman to swing it into any desired position. As the pipe 17 is mounted on a ball bearing, it will turn freely and the load may be swung around the mast as desired. The contact plates 5 and 26 may be secured to the floor and ceiling respectively, if desired, but this will seldom be found necessary.

The details of construction and the proportions of the parts may all be changed by those skilled in the art without departing from the spirit of my invention as set forth in the following claims.

I claim:—

1. In a crane, a mast formed of two alined parts freely rotatable relative to each other, one of the parts being longitudinally extensible, a windlass and a boom connected to one of said parts of the mast, and means to secure the upper and lower ends of the mast consisting of a socket adapted to be pressed against the ceiling of a building and in which the upper end of the mast is rotatable and a lower contact plate connecting to the lower end of the mast by means of a universal joint.

2. A portable crane comprising a sectional mast, one section carrying a boom and windlass and the other including extending means capable of exerting great pressure, the sections being aligned and relatively rotatable, and a pressure plate at each end of said mast and rotatable thereon, one of said pressure plates being connected to the mast through a ball and socket joint.

3. A portable crane including a floor plate, a hollow mast section connected thereto by a ball and socket joint, a second section screw-threaded into the upper end of said hollow section and having means whereby the same may be rotated, an upper boom section telescoped on said second section and freely rotatable thereon, and a ceiling plate rotatably mounted on the upper end of the boom section, said boom section also carrying a windlass and boom.

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