Dec. 21, 1926. 1,611,326

E. J. ABBE

EXTENSIBLE BOOM

Filed April 7, 1924 2 Sheets-Sheet 1

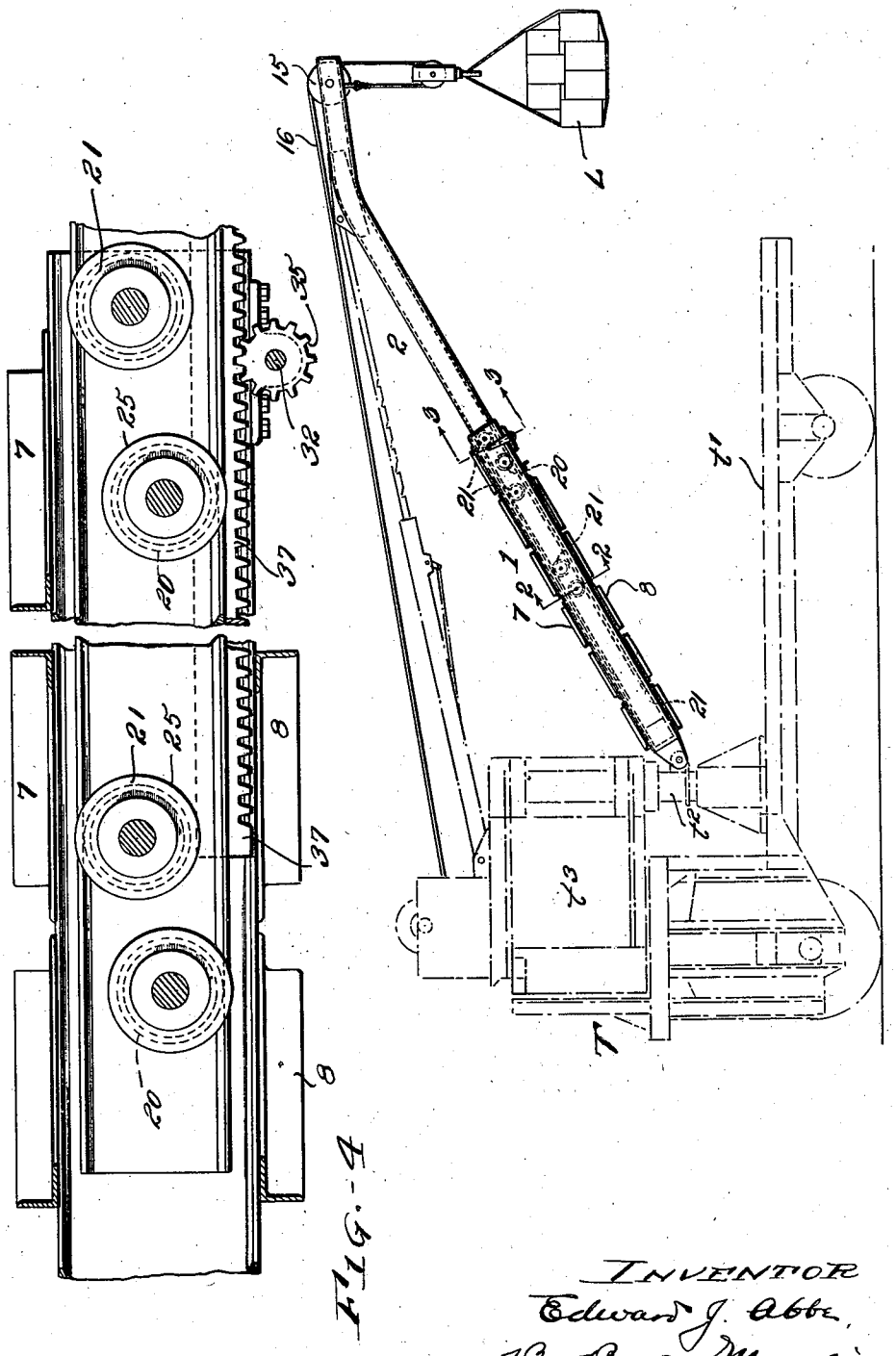


FIG. 1.



FIG. 2.

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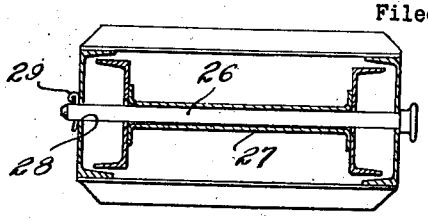



FIG. 6

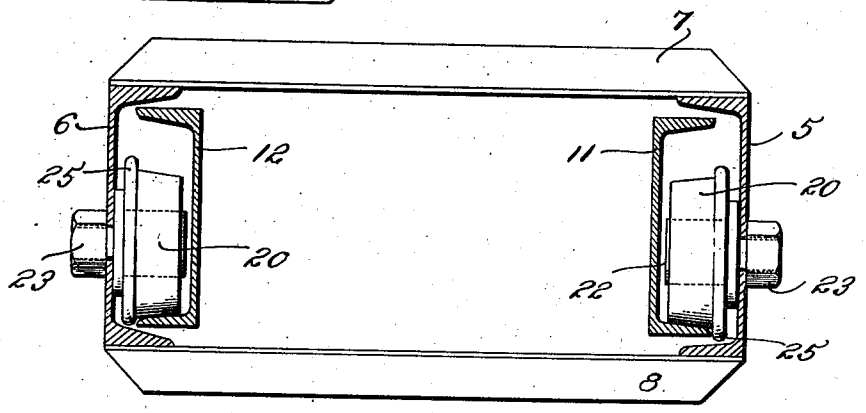



FIG. 2.

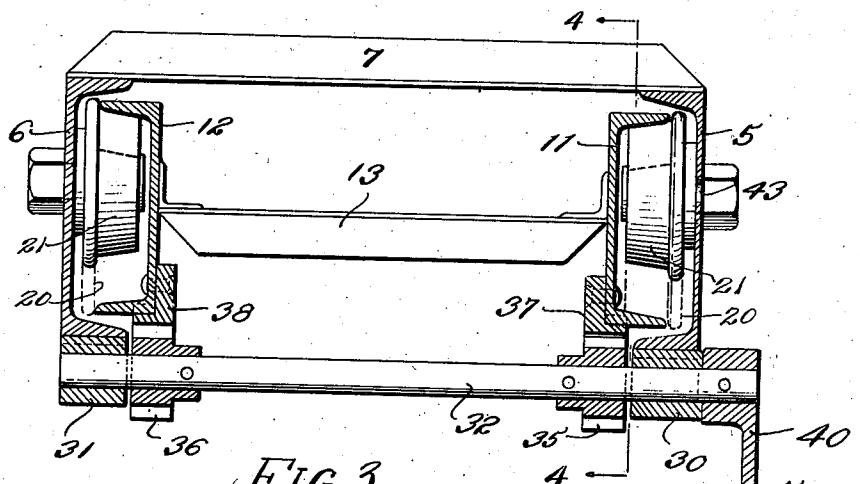



FIG. 3.

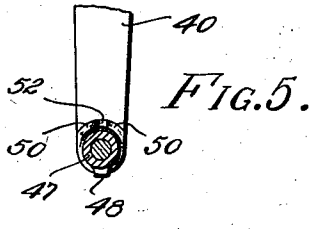
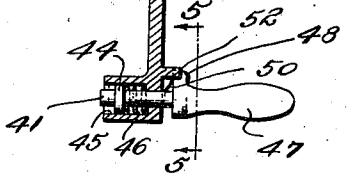



FIG. 5.




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Patented Dec. 21, 1926.

1,611,326

# UNITED STATES PATENT OFFICE.

EDWARD J. ABBE, OF CLEVELAND, OHIO, ASSIGNOR TO THE ELWELL-PARKER ELECTRIC COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## EXTENSIBLE BOOM.

Application filed April 7, 1924. Serial No. 704,675.

This invention relates to industrial trucks and more particularly to that type of tractor trucks known as an industrial crane truck, wherein a crane is mounted upon the body of the truck for the loading and unloading thereof.

The general object of the invention is to provide an extensible crane or boom for this type of truck.

My invention more particularly contemplates the provision of an extending boom or crane which may be easily and quickly extended or retracted from some point on the truck.

Other objects include the provision of a collapsible boom for a truck which may be extended for use in loading or unloading as from railway to a platform and which may be collapsed when it is desired to move the truck from place to place in more or less limited trackway.

Another object is the provision of a compactly built telescoping boom which may be either used on a truck, such as referred to, or be mounted upon a stationary base, and which may be easily and cheaply manufactured from the usual conventional structural sections.

Another object is to provide a rigid construction for an extensible boom which will be equally rigid in extended as well as retracted position.

Other objects will become apparent in the description of my invention pertaining to the accompanying drawing and the essential characteristics thereof will be summarized in the claims.

In the drawing, Fig. 1 is a side elevation of my extensible boom mounted upon a truck; Fig. 2 is a cross-section taken substantially along the line 2—2 of Fig. 1; Fig. 3 is a similar cross-section taken along the line 3—3 of Fig. 1; Fig. 4 is a fragmentary longitudinal section taken substantially along the line 4—4 of Fig. 3; Fig. 5 is a sectional side elevation of the operating crank taken along the line 5—5 of Fig. 3; Fig. 6 is a cross section, through a modified form of my boom.

The preferred embodiment of my invention is shown as applied to a platform truck such as shown in a prior patent issued to Clyde E. Cochran No. 1,481,351. Accordingly I show a four wheel truck T in broken lines having a forwarded extension $T^1$ in the nature of a platform; a turret $T^2$ mounted thereon, which pivotally supports the boom at one side thereof and at the opposite side, cable hoisting mechanism shown at $T^3$ comprising power means such as storage batteries, motor and cable hoisting mechanism necessary to operate the crane and which form a convenient counter-balance for the crane in whatever position it may be swung relative to the body of the truck.

The boom as shown consists generally of a pivoted frame 1 and an extension 2 carrying at its outer end a sheave 15 over which the hoisting cable 16 extends to support the load L in the usual manner.

The prevailing practice in constructing booms for this type of truck has been to adopt a medium length of boom such that it will not interfere with the ceiling of the usual factory building, and yet be long enough to conveniently reach the average load to be lifted by approaching the load in the running direction of the truck or by swinging the boom sideways thereof. The result of this has been that the maximum reaching efficiency of the boom has been sacrificed because of lack of head room in which to operate in some of the required locations.

It is not my purpose to limit my invention to use upon a truck such as shown since the combination would be equally effective stationarily mounted. My invention preferably comprises a pair of telescoping boom members preferably formed of the conventional structural sections in which the base or pivoted portion of the boom consists of channel members 5 and 6, the flanges of the channels projecting inwardly, suitable bracing members 7 and 8 being provided above and below the channels in the usual manner. The inner and sliding portion of the boom, I prefer to construct of similar structural shapes, channels as shown, with their respective flanges projecting outwardly. The size of channel selected for this purpose is such that when spaced apart and braced as by the usual lattice construction shown in Fig. 3 at 13, the outward edges of the flanges will slightly clear the flanges on the channels 5 and 6.

To eliminate sliding friction between the two telescoping units I provide rollers 20 and 21 arranged to bear against the upper and lower flanges of the channels 11 and 12

respectively. As shown, the rollers are completely guarded by reason of being within the confines of the webs and flanges of their respective channels 5 and 6. I have shown the rollers carried by studs 22 and held tightly in position upon the channel members 5 and 6 by means of nuts 23. The periphery of each roller is shown as conical to conform to the slight angle upon the inner surface of the flange of a standard channel, and by reason of the rollers being disposed at intervals along both flanges of each of the inner channels, the rollers serve to centralize the inner boom member with respect to the outer boom member and thus prevent sliding friction between the channels. The rollers may be provided with peripheral flanges 25 to prevent sliding friction between the channels should the parts become worn or if from other causes the rollers do not lie fairly snugly against their respective flanges.

The rollers may be arranged in any manner along the member 1, but I prefer to alternately position the upper and lower rollers throughout the length of the boom member 1 as shown, by which arrangement I am enabled to use larger rollers. Near the free end of the member it is preferable to place a single pair of rollers 20 between two pairs of rollers 21 or vice versa in order to support the boom member 2 in its extreme outward position.

Carried by the flange members 5 and 6, I have shown brackets 30 and 31, forming a bearing for a shaft 32 upon which are suitably mounted a pair of pinions 35 and 36. These pinions are adapted to mesh with racks 37 and 38 mounted in any manner upon the channel members 11 and 12. I prefer to employ a crank 40 rigidly mounted on one end of the pinion shaft for driving the racks to extend the boom. I prefer to make provision for holding one boom member locked to the other in any extended position by using a plunger 41 mounted upon the end of the crank and which may be allowed to drop into one or more recesses 43 on the member 5 whenever it is desired. The plunger 41 has an enlarged portion 44 which slidably engages the walls of a recess 45. The plunger is normally urged outwardly by a coil spring 46. A handle 47 is mounted upon the other end of the plunger member 41 and carries a lug 48 upon one side thereof, which, when gripped by the operator upon turning the crank, rides along a cam surface 50 or 51 upon the crank arm until it engages an abutment 52, thereby withdrawing the plunger 41 a sufficient distance to clear the boom member 5.

If desired I may provide operating means for the gears that will extend rearwardly to the operator's position on the truck. Suitable bevel gearing (not shown) might be attached at one end of the shaft 38 and communicate with the hoisting mechanism body $t^3$ through a splined telescoping shaft which might be either power or manually driven.

Since the tendency of the extending portion of the boom is always to drop backward into the pivoted portion, ratchet pawls (not shown) may be arranged to engage the teeth on the gear 36 to hold the boom in any desired extended position.

In the modified form of boom shown in Fig. 6, I have shown the extensible member 2 pinned to the pivoted member 1 by a bar 26. In this construction the lacing 13 (shown in Fig. 3) may be replaced by flanged tubes 27 which would be placed at short intervals along the boom member 2. These tubes would serve to guide the bar 26 to facilitate its insertion into the hole 28. The bar may be held in place in any manner as by a spring pin 29.

I claim:

1. In an extensible boom, a hollow frame member, a boom member extending within the frame and having outwardly extending flanges disposed along its side edges in pairs and rollers carried by the frame disposed between each pair of flanges, one of two adjacent rollers engaging one of a pair of flanges and the other engaging the other flange of the same pair, said adjacent rollers being separated longitudinally of the frame.

2. An extensible boom comprising a rigid hollow frame arranged to be pivotally supported at one end, a second frame comprising members having upper and lower outwardly extending flanges, and rollers arranged in sets, supported by the first named frame and bearing against the flanges, said sets being alternately disposed along the first named frame, one set of rollers contacting with the lower flanges and the adjacent set contacting with the upper flanges.

In testimony whereof, I hereunto affix my signature.

EDWARD J. ABBE.