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G. A. VAUGHN

LONGITUDINALLY EXTENSIBLE BOOM FOR EXCAVATING MACHINES

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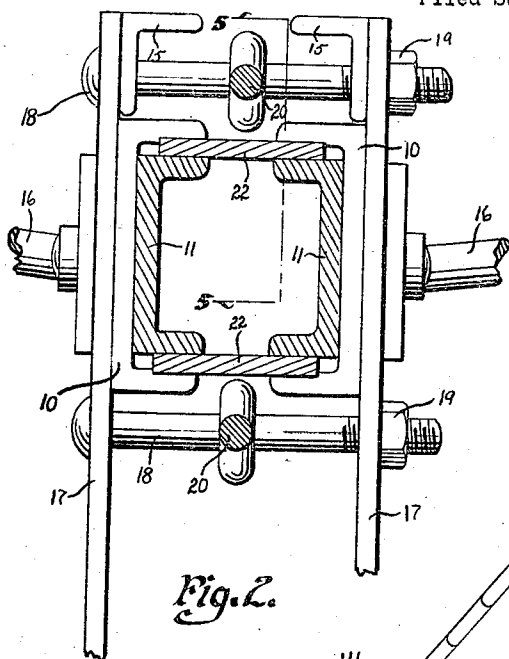


Fig. 2.

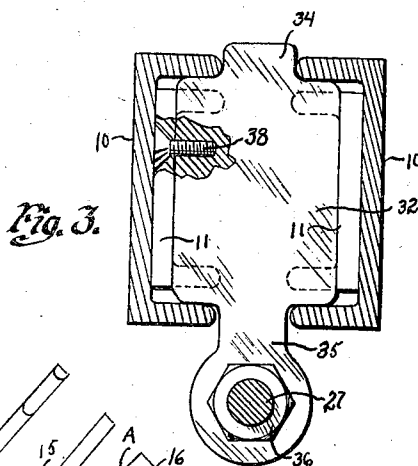


Fig. 3.

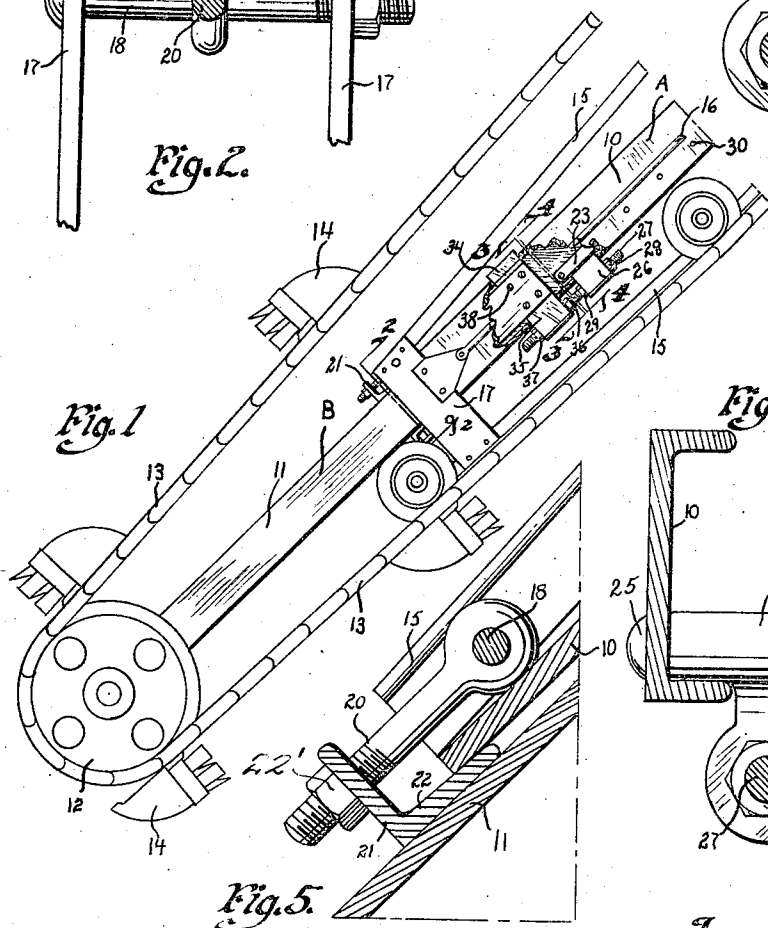


Fig. 1

Fig. 5.

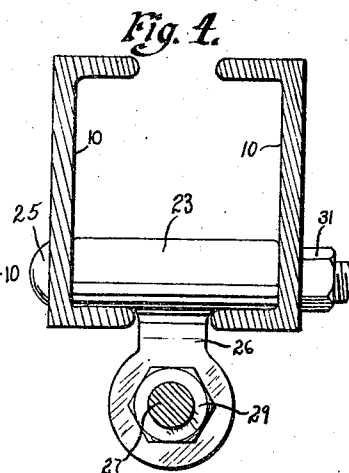


Fig. 4.

Witness
David Bair

Inventor
George A. Vaughn
by Bair & Freeman Attorneys

UNITED STATES PATENT OFFICE.

GEORGE A. VAUGHN, OF NEWTON, IOWA, ASSIGNOR TO THE PARSONS COMPANY, OF
NEWTON, IOWA.

LONGITUDINALLY-EXTENSIBLE BOOM FOR EXCAVATING MACHINES.

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The purpose of my invention is to provide a boom for excavating machines, which will be of durable and rigid construction and will quickly permit of ready and convenient lengthwise adjustment, because of certain novel features of structure, whereby the parts of the boom are mounted and connected together.

With this and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my longitudinally extensible boom, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a portion of a boom illustrating my invention.

Figure 2 is a detail, sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a detail, sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a sectional view taken on the line 4—4 of Figure 1; and

Figure 5 is a detail, sectional view taken on the line 5—5 of Figure 2.

My invention has to do with the provision of a longitudinally extensible boom, particularly adapted for machines of the type in which the boom carrying the excavating machinery, such for instance, as endless chains and buckets, is pivoted at the rear end of the machine and is designed to be lowered into the ditch or raised for the convenient transportation of the machine.

It is frequently desirable that the length of such a boom be varied, and it is somewhat difficult to make a longitudinally extensible boom, because of the difficulties of convenient adjustment and of securing proper rigidity when the adjustment has been made.

It is my purpose to provide such a boom wherein such difficulties are eliminated.

In the accompanying drawings, I have used the reference character A to indicate generally the upper section of the boom, which may be mounted at its upper end in any suitable way, preferably by being pivoted on a shaft, not here shown.

The upper boom section A comprises laterally, spaced, inwardly opening channels 10, which may be held in proper spaced relation at their upper ends in any desired and usual manner.

I provide likewise a lower boom section B.

The lower boom section B likewise comprises a pair of laterally spaced inwardly opening channels 11.

These channels are of such size as to be received within the channels 10, spaced vertically from the flanges thereof.

The lower end of the boom section B may be supported and arranged with the members 11 properly spaced apart in any suitable manner.

At the lower end of the boom are the chain wheels 12 carrying the chains 13 on which are mounted the excavating buckets 14.

I will now describe the construction and method for connecting together the upper and lower boom sections for permitting longitudinal adjustment thereof.

Supported on the main frame of the machine, not here shown, are angle iron supports 15, shown in Figures 1 and 2, and supporting rods 16.

At the lower end of these supports, laterally spaced plates 17 are fixed thereto on opposite sides of the lower end of the upper boom section A. There is enough resiliency in the supports to permit these plates to be moved toward or from each other enough to tightly grip the lower end of the upper boom section or to release it.

Just above the lower end of the upper boom section, a bolt 18 is extended through the plates 17, and has on its end the nut 19. Just below the lower end of the upper boom section a similar bolt and nut are provided.

By tightening the nuts 19 on the bolts 18, it will be seen that the lower end of the upper boom section A may be gripped between the plates.

Mounted on each of the bolts 18 is an eye bolt 20, extending away from the bolts 18, parallel with the lower boom section, as shown in Figures 1 and 5.

Mounted on each eye bolt 20 is a flange 21 of a wedge 22. The wedge 22 is adapted to be inserted between the upper end of the lower boom section and the lower end of the upper boom section, as shown in Figures 2 and 5. The wedge is slipped between the two boom sections above and below the lower boom section, as shown. Nuts 22' are then tightened on the eye bolts 20 for forcing the wedges between the boom sections, as illustrated in Figure 5.

For providing means for preventing the members 10 from being pressed together and for holding them properly spaced, and yet allowing the telescopic adjustment of the parts, I have provided a filler 23, having at its ends transverse holes (see Figures 1 and 4) to receive bolts 25.

The filler 23 has relatively narrow, downwardly projecting portions 26 extending between and below the channel members 10 just above the upper ends of the members 11.

Adjustably mounted in the downward extension 26 is a screw-threaded rod 27. On the rod 27 on opposite sides of the portion 26 of the filler 23 are adjusting nuts 28 and 29, shown for instance in Figures 1 and 4.

The channel members 10 are provided with a series of aligned pairs of holes 30, spaced from each other at such distances as to receive the bolts 25 on which are the nuts 31.

The filler 23 is in the form shown in Figures 1 and 4 and rests in the lower part of the upper boom section A near the lower or rear end thereof.

In the upper or forward end of the lower boom section B, there is mounted a filler 32.

The flanges on the channels 11 are cut away at the upper forward ends of said channels, and the filler 32 is of such size as to snugly fill the space between the channels 11, where the flanges thereof are cut away, and the filler 32 is of such size from top to bottom as to snugly fit between the flanges of the channels 10, as shown in Figure 3.

The filler 32 has a central, upward extension 34 extending between the upper flanges of the channels 10, and a downward extension 35 extending between the lower flanges of the channels 10. The lower extension 35 has a suitable opening to receive the rod 27 already mentioned.

On opposite sides of the extension 35 on the bolt 27 are adjusting nuts 36 and 37.

It will thus be seen that the filler 23 is locked to the upper boom section A by means of the bolts 25 and is adjustably connected with the filler 32 by means of the rod 27 and the nuts thereon.

The channels 11 are fixed to the filler 32 by means of screws 38, the heads of which are countersunk in the channels 11.

Assuming that the parts are assembled as herein explained, and that it is desired to vary the total length of the boom, such variation can be accomplished in the following manner:

The nuts 31 are removed, and the bolts 25 taken out. The nuts 22' are removed and the wedges 22 may then be taken out. The nuts 19 are then loosened, whereupon the boom section B is slid in either direction for either shortening or lengthening the boom until the holes in the filler 23 reg-

ister with the desired holes 30, whereupon the bolts 25 are replaced, and the nuts 31 screwed thereon. Then the nuts 28, 29, 36 and 37 are adjusted to get the finer adjustment of the boom, which is determined by the number of links of the chains 13 taken out or put in. Then the wedges are replaced, driven into position, and the nuts 22 screwed onto the eye bolts 20, and thereafter the nuts 19 are tightened.

It will be seen that the fillers 23 and 32 help to lock the boom sections together against longitudinally slipping or adjustment, since the filler 32 is rigidly connected with the lower boom section, and the filler 23 is rigidly connected with the upper boom section.

The filler 32 also holds the members 11 tightly against the members 10 and in cooperation with the filler 23 and plates 17 and bolts 18 prevent any pivotal, or lateral movement of the boom sections with relation to each other.

The wedges 22 lock the boom sections together against any vertical, pivotal movement.

The plates 17 are fixed on the main frame of the machine by means of the support 15 and the rod 16, while the filler 32 moves with the lower boom section.

The filler 23, being mounted on the rod 27, which is in turn supported on the filler 32, is adjusted with the filler 32.

The device is comparatively simple and affords a rigid connection between the boom sections, which, however, can be readily manipulated for making any desired longitudinal adjustment.

Changes may be made in the details of the construction and arrangement of the parts without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a longitudinally, extensible boom, a boom section comprised of laterally spaced members, a second boom section comprised of smaller laterally spaced members, one end of the second boom section being received in one end of the first boom section, means secured on the inside of the second boom section for holding its members properly spaced apart, a filler adjacent to the end of the second boom section received between the members of the first boom section, means for detachably connecting said filler with the first boom section, adjustable means for connecting said first means and said filler together, means for gripping the members of said first boom section together and thus gripping between them the members of the second boom section.

2. In a longitudinally, extensible boom, a boom section comprised of laterally spaced members, a second boom section comprised of smaller laterally spaced members, one end of the second boom section being received in one end of the first boom section, means secured on the inside of the second boom section for holding its members properly spaced apart, a filler adjacent to the end of the second boom section received between the members of the first boom section, means for detachably connecting said filler with the first boom section, adjustable means for connecting said first means and said filler together, means for gripping the members of said first boom section together and thus gripping between them the members of the second boom section, the members of said first boom section comprising inwardly opening channels, and means for holding the inserted end of the second boom section in spaced relation to the members of the outer boom section.

3. In a longitudinally extensible boom, a boom section comprised of laterally spaced members, a second boom section comprised of smaller laterally spaced members, one end of the second boom section being received in one end of the first boom section, means secured on the inside of the second boom section for holding its members properly spaced apart, a filler received between the members of the first boom section, adjustable means for connecting said first means and said filler together, means for gripping the members of said first boom section together and thus gripping between them the members of the second boom section.

4. In a longitudinally extensible boom, a boom section comprised of laterally spaced channel members, a second boom section

comprised of smaller laterally spaced channel members, one end of the second boom section being received in one end of the first boom section, means secured on the inside of the second boom section for holding its members properly spaced apart, a filler adjacent to the end of the second boom section received between the members of the first boom section, means for detachably connecting said filler with the first boom section, adjustable means for connecting said first means and said filler together, means for gripping the members of said first boom section together and thus gripping between them the members of the second boom section, and means carried by said gripping means, for holding said boom sections in properly spaced telescoping relation.

5. In a longitudinally extensible boom, a boom section comprised of laterally spaced channel members, a second boom section comprised of smaller laterally spaced channel members, one end of the second boom section being received in one end of the first boom section, means secured on the inside of the second boom section for holding its members properly spaced apart, a filler adjacent to the end of the second boom section received between the members of the first boom section, means for detachably connecting said filler with the first boom section, adjustable means for connecting said first means and said filler together, means for gripping the members of said first boom section together and thus gripping between them the members of the second boom section, and means carried by said gripping means for holding said boom sections in properly spaced telescoping relation, comprising adjustable wedges.

GEORGE A. VAUGHN.