

Aug. 4, 1931.

A. EILERSGAARD

1,817,809

EXCAVATING MACHINE

Filed Jan. 13, 1928

3 Sheets-Sheet 1

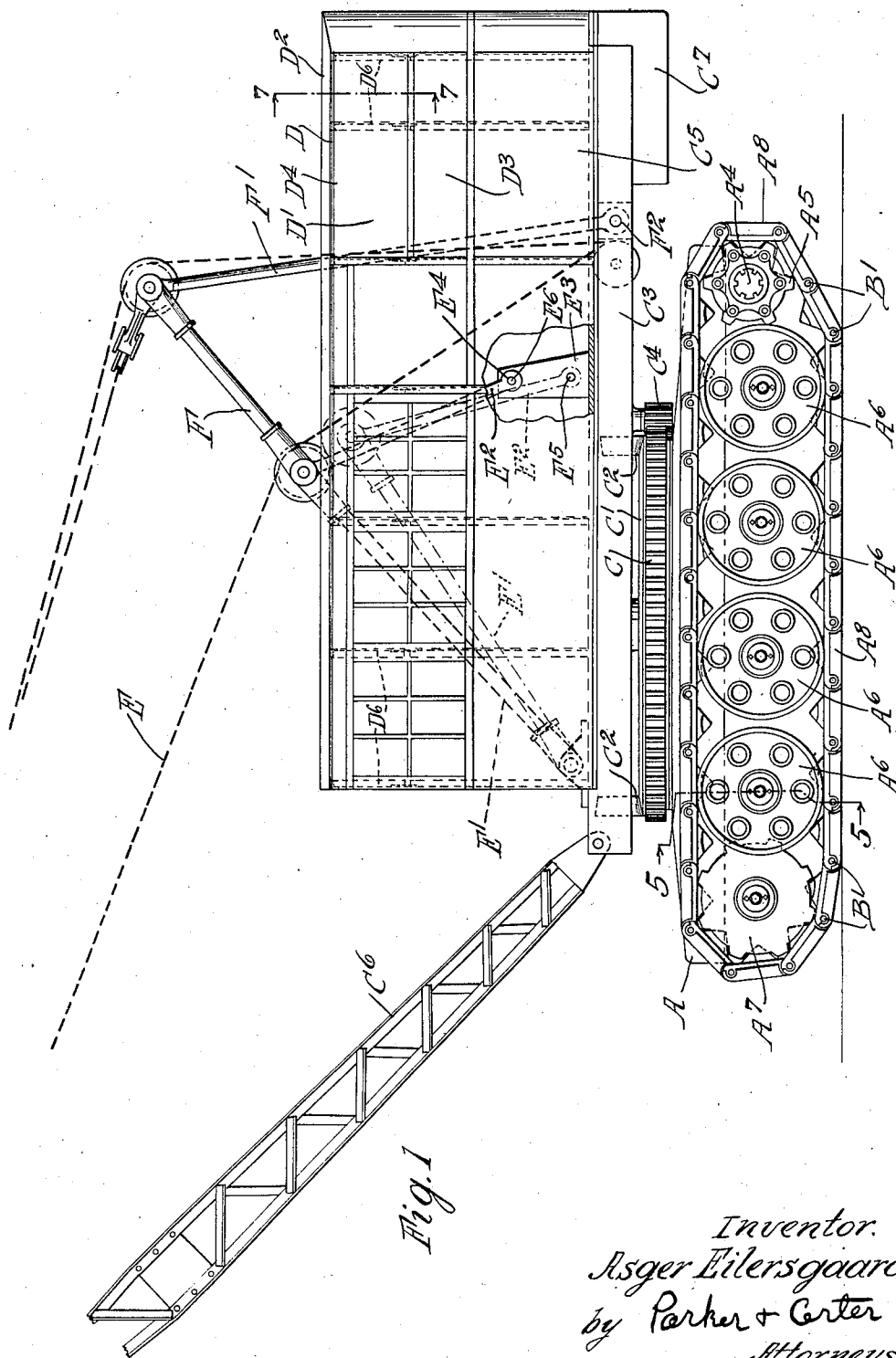


Fig. 1

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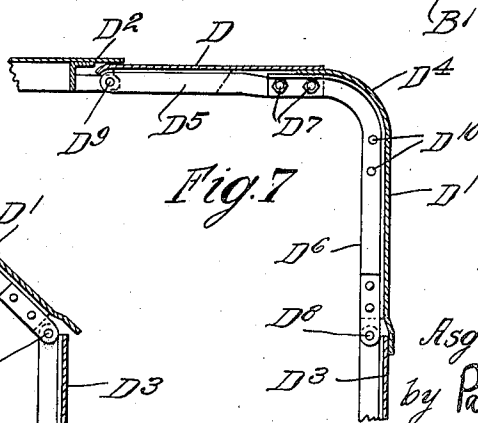
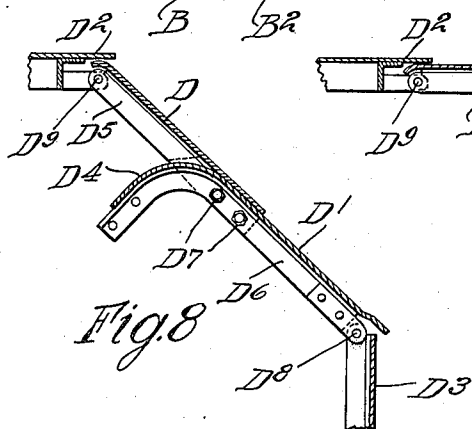
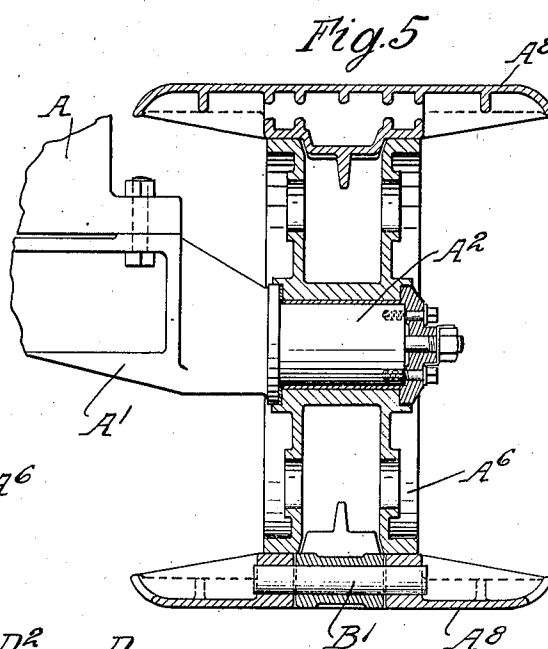
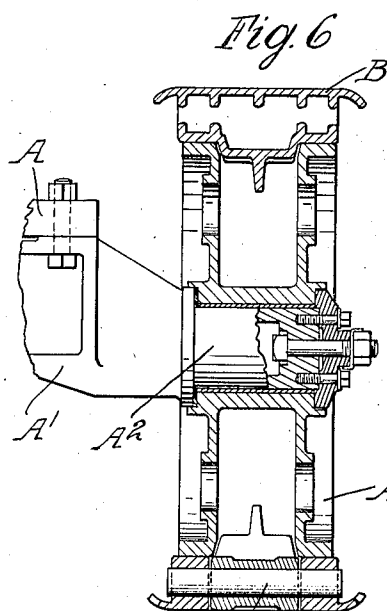
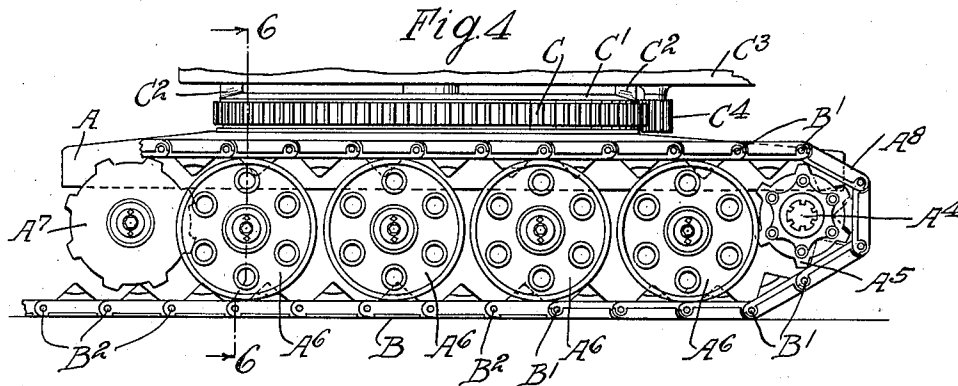
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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EXCAVATING MACHINE

Application filed January 13, 1928. Serial No. 246,429.

My invention relates to improvements in excavating machinery and has for one object to provide a new and improved type of shovel or excavating machine of the caterpillar supported type wherein the cross sectional area of the machine may be reduced for shipment without entirely dismantling the apparatus to a size which falls within the standard railroad clearance. Another object of my invention is to provide a device wherein the relatively wide caterpillar treads which must necessarily be used during the operation of the machine may be conveniently and easily removed and there may be substituted for them a relatively narrow caterpillar tread wide enough to support the load of the machine during shipment. Another object is to provide a supporting mechanism with which there may be interchangeably used wide working treads and narrow shipping treads. Other objects will appear from time to time in the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying drawings wherein—

Figure 1 is a side elevation;

Figure 2 is an end view with the apparatus rigged for working;

Figure 3 is an end view with the apparatus rigged for shipping;

Figure 4 is a detail side elevation showing the machine in the act of moving from the working track to the shipping track;

Figure 5 is a section along the line 5—5 of Figure 1;

Figure 6 is a section along the line 6—6 of Figure 4;

Figure 7 is a detail section on an enlarged scale along the line 7—7 of Figure 1;

Figure 8 is a detail along the same line as Figure 7 showing the parts in the collapsed position.

Like parts are indicated by like characters throughout the specification and drawings.

A is a crawler frame. Projecting from this crawler frame are a series of crawler supporting brackets A¹ terminating in stub axles A². A³ is a transmission housing carried by the frame; projecting from this transmission housing are driving shafts A⁴.

Mounted for rotation with the driving shafts A⁴ are driving sprockets A⁵. Mounted for rotation on the stub end axle shafts A² are supporting and idler rollers A⁶, there being an idler sprocket A⁷ of smaller diameter toward the front end of the machine. A⁸ is a crawler track adapted to travel along these idler sprockets A⁷ and supporting rollers A⁶ and the driving sprocket A⁵, this crawler track being continuous.

It will be noted that the brackets A¹ and their stub end shafts A² extend out far enough so that these rollers may engage the central portion of the relatively wide track, this track being as much as thirty-six inches wide, there being one track on either side of the machine. The transmission from the power source and the control of the tracks for stopping, starting or driving form no part of my invention and are not here illustrated or described.

B is a shipping crawler track, the links of which are much narrower than the links of the track A⁸, perhaps only fourteen or sixteen inches in width. These tracks, there being one on each side of the apparatus are substantially the width only of the supporting rollers. It will be noted that these tracks also are shown as endless, and are preferably so made though under some conditions it might be sufficient to have merely a length of shipping track on each side only long enough to carry the vehicle without having the tracks extending up around the upper sides of the rollers. The tracks A⁸ and the tracks B are made up of separate articulated track link sections. These sections are held together by pins B¹ in the case of the links forming the track A⁸ and by similar pins B² in the case of the links forming the tracks B. In each case the links are of the same diameter and the articulated portions of the links are such that a link forming the track B may be pinned to a link forming the track A⁸ so that it is possible to disconnect the working track A⁸, take out a pin B¹ of the upper links, couple to one end of the working track supporting the apparatus a section of shipping track and move the machine by its own power from the working track onto the shipping track. If desired

the shipping track may be laid on a railroad car and anchored and the machine can draw itself into position or if desired a complete shipping track may be substituted for the working track and the machine may be maneuvered from place to place on some roads as it is loaded or unloaded on the car. This is especially desirable because under some circumstances the very wide working track make the machine somewhat less maneuverable than the narrow shipping tracks and the narrow shipping tracks are sufficient to support the load when working on a firm foundation.

Mounted on the frame A is a ring gear C which provides on its side a track C¹, rollers C² travel along this track and support the working platform C³. A pinion C⁴ extends down from the working platform to mesh with the ring gear C and means are provided not here shown within the housing C⁵ on the working platform to operate this pinion to swing the working platform about its pivot point concentric with the ring gear C. A boom of any suitable type C⁶ is pivoted on the working platform and may be raised and lowered or removed as the case may be. For shipping, this boom may be lowered so that it is supported on a separate railroad car adjacent the car carrying the excavating machine itself. The rear end of the working platform C³ is provided with a storage pocket C⁷ in which the separate links forming the working track may be stored so that these links when the machine is in operation may be used as counterbalance weights to counterbalance the boom and the load carried by it, thus making it unnecessary to provide any separate counterbalance weights and since the cost of the links is little more than the cost of the counterbalance weights the expense of these links is negligible.

It will be noted that the housing C⁵ comes at the top to a relatively sharp corner. This sharp corner is built up of two separate panels D D¹. The panel D being relatively narrow and over and in continuation of the roof D², the panel D¹ being wider than the panel D in continuation of the wall D³ and having a curved corner D⁴ about a relatively short radius. These panels D D¹ are reinforced by a series of angle irons D⁵ D⁶ and when in the working position the end of the iron D⁵ is attached to the end of the iron D⁶ by bolts D⁷ as indicated, thus affording clearance inside the working housing for the operator as he moves about the machinery. For shipping the bolts D⁷ are removed. The member D¹ is moved inwardly about the pivot D³ beneath the member D. The member D is moved downwardly about the member D⁶ to rest upon the plate D¹ bringing the bolt holes D¹⁰ in the angle irons D⁶ into register with the bolt holes at the ends of the irons D⁶, thus leaving the working house C⁶ closed but in ef-

fect knocking off its upper corners, taking away from the inside the necessary working clearance but giving on the outside a contour which falls within standard railroad clearances.

The boom C⁶ is supported by means of a cable E which extends from a supporting mast or A-frame. One arm of the A-frame E¹ is pivoted at the front end of the working platform C³. The other link of the A-frame E² may be selectively pivoted on the abutment E³. This abutment has a plurality of holes E⁴ E⁵ and a wrist pin E⁶ may be placed through either the holes E⁴ or E⁵ to support the rear end of the link E². When the wrist pin engages the holes E⁴ the apex of the A-frame is raised above the roof into normal working position. When the wrist pin engages the frame A⁵ the A-frame is lowered into a point level with the roof of the cab C⁵ and falls then within the normal railroad clearance but it does this while still providing an anchorage for the cable E so that the boom may still be supported.

The purpose of this mast or A-frame is to furnish a maximum amount of support to the boom and therefore for carrying loads it is essential that the apex of this roof be above the cab but for maneuvering and shipping when no work is being done the boom will not be lowered by the position on the A-frame.

In order to take care of conditions where an exceptionally long boom is used, it is sometimes necessary to have the apex of the A-frame even higher. This is accomplished by extending an additional link F pivoted to the apex of the A-frame in line with the link E¹ and supporting this link F by a separate link F¹ which extends from the upper end of the link F down to an abutment F² on the working platform. These two links would of course be removed for shipment and the fact that they have been used would in no way limit the downward adjustment of the apex of the main A-frame to withdraw it inside railroad clearance lines.

It will be obvious that the mechanism shown is applicable to a loading machine, a drag line excavator, a crane, a shovel or any device which involves a boom or similar element projecting from the working platform for the purpose of lifting loads or excavating or conveying machinery and where in the claims I have used language directed to excavating machines or lifting machines or anything of that general type it is understood that this language is used merely for the purpose of illustration and that the invention claimed involves any machine of the type specified.

While I have shown my invention as applied to an excavating machine or crane and while I have for the purpose of illustration referred to it in terms of such a device mani-

festly the invention is equally applicable to any device including a working platform, a housing or cap, a supporting mechanism and working machinery on the platform which can be collapsed so as to reduce it to smaller cross sectional area for shipment or other purposes than the normal cross sectional area of the machine. I wish that my claims be regarded as being equally applicable to any device wherein such collapsibility appears. Moreover, I have referred to the reduction in size in terms of railroad clearance as these are clearances that are known to all and fixed and standard. Obviously it might be desirable to have a machine which was of greater or less size than this which could be reduced from its working size to predetermined clearance dimensions.

I claim:

1. In a portable machine, a working platform, a cab supported upon and enclosing it having generally vertical walls and a generally horizontal top, the top and the walls adjacent the upper longitudinal corners of the cab comprising separate panels, one panel hinged to the top, the other hinged to the wall and means for holding the panels in intersecting relation to form the corners of the cab, means for disconnecting the panels and rotating them inwardly to bring the roof panel into parallelism with and overlying the wall panel to provide a continuous closure for the cab when in the collapsed position.

2. In a portable machine, a working platform, a cab upon the platform having a fixed roof and fixed walls, the fixed roof terminating within and above the tops of the fixed walls, a panel pivoted on the roof and adapted to extend therebeyond, generally in continuation therewith, toward the wall, means for supporting the panel in such position, the panel being adapted to be rotated downwardly into parallelism with an imaginary line joining the edge of the fixed roof and the top of the fixed wall.

3. In a portable machine, a working platform, a cab thereupon having a fixed roof and fixed walls, the fixed roof terminating within and above the tops of the fixed walls, panels pivoted on the walls and adapted to extend therebeyond generally in continuation therewith toward the roof, means for supporting the panels in such position, the panels being adapted to be rotated inwardly into a line generally parallel with an imaginary line joining the edge of the roof and the wall.

4. In a portable machine, a working platform, a cab thereupon having a fixed roof and fixed walls, the fixed roof terminating within and above the tops of the fixed walls, panels pivoted on the walls and adapted to extend therebeyond generally in continuation therewith toward the roof, means for

supporting the panels in such position, the panels being adapted to be rotated inwardly into a line generally parallel with an imaginary line joining the edge of the fixed roof and the wall, a panel pivoted on the roof and adapted to extend therebeyond generally in continuation therewith toward the wall, means for supporting such panel in position, such panel being adapted to be rotated downwardly into a line generally parallel with the panels pivoted on the walls.

5. In a portable machine, a working platform, a cab thereupon having a fixed roof, and fixed walls, there being an opening between them, panels associated with the roof and the wall adapted to close said opening in general continuation of the roof and the wall, said panels being movable when collapsed into a generally straight line joining the fixed roof and the fixed wall to reduce the clearance of the cab.

Signed at Chicago, county of Cook and State of Illinois, this 11th day of January, 1928.

ASGER EILERSGAARD.