

Oct. 23, 1928.

1,688,643

G. A. MURFEY ET AL

STEERING MECHANISM FOR CRANES

Filed Feb. 9, 1925

3 Sheets-Sheet 1

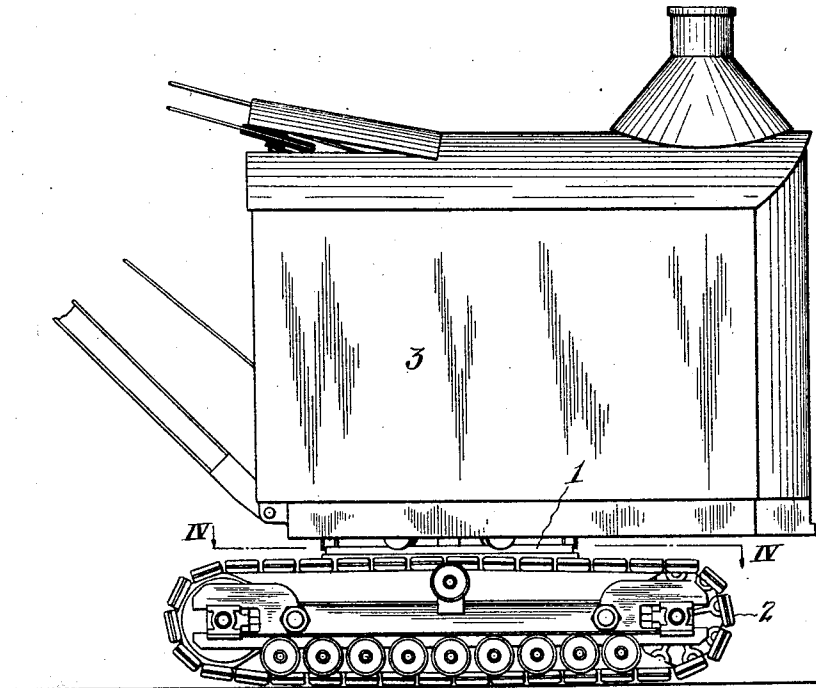


FIG. 1.

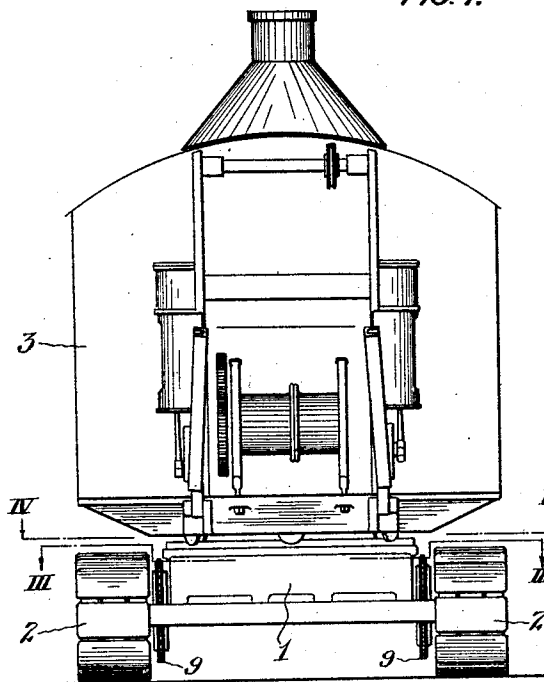


FIG. 2.

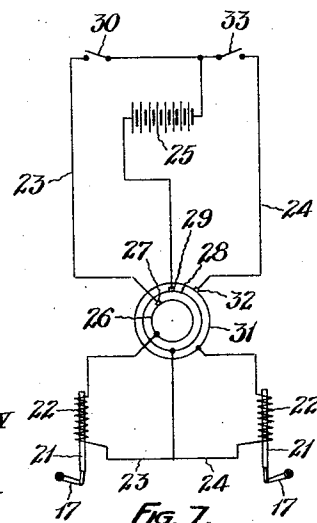


FIG. 7.

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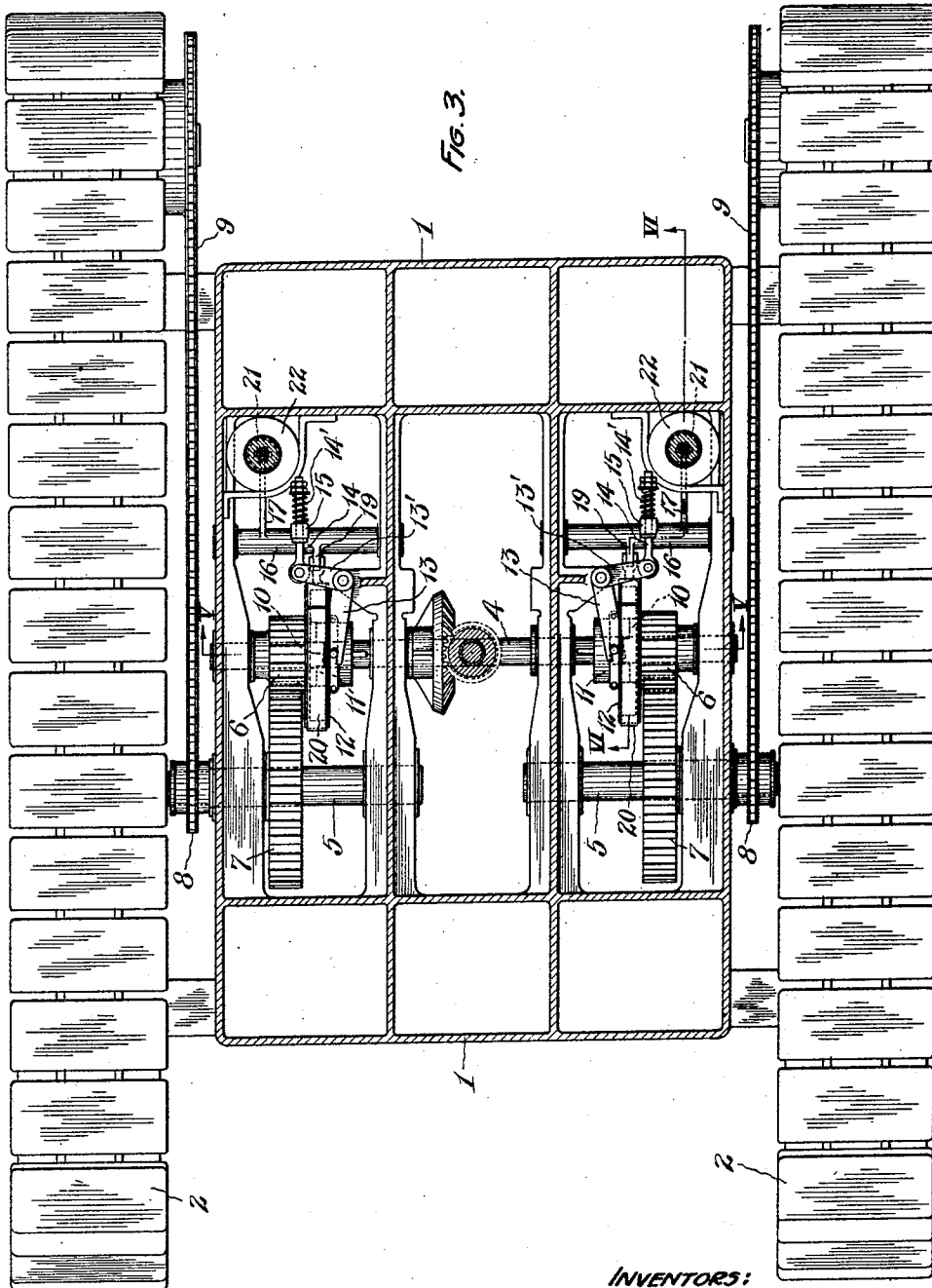
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

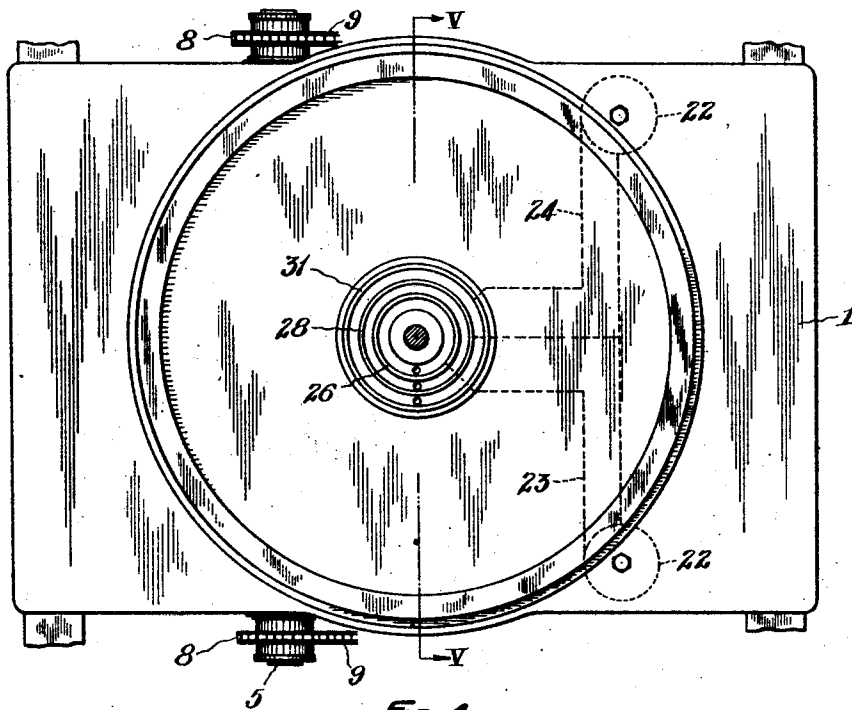


FIG. 4.

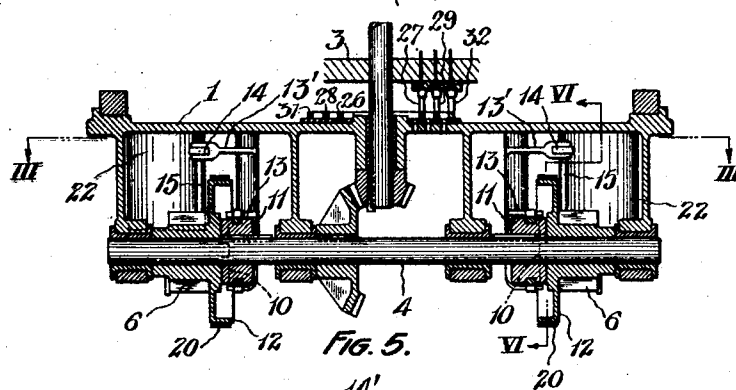


FIG. 5.

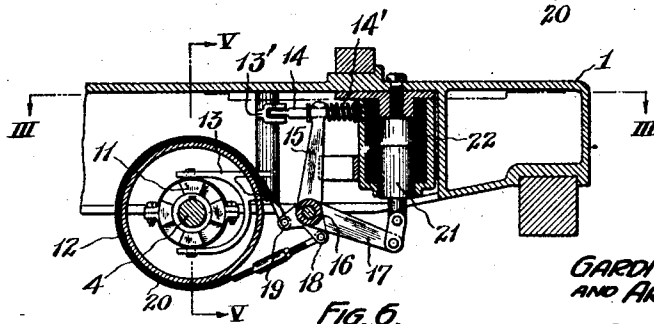


FIG. 6.

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UNITED STATES PATENT OFFICE.

GARDNER A. MURFEY AND ARTHUR S. MEYER, OF CLEVELAND HEIGHTS, OHIO, ASSIGNORS TO THE BROWNING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

STEERING MECHANISM FOR CRANES.

Application filed February 9, 1925. Serial No. 7,762.

Our invention relates to traction control or steering mechanism for tractable cranes primarily of that class in which the supporting traction members, disposed upon opposite sides of the base, may be separately or simultaneously driven, and which include a rotatable cab in which the rotating and hoisting mechanisms are mounted.

Heretofore, the steering mechanism for such cranes has been mounted wholly upon the base, has been entirely mechanical and included two separate steering control wheels and stems, so that when it was necessary to change the direction of travel of the crane, the operator in the cab was obliged to descend from the cab to operate the steering mechanism, or a separate operator was provided for that purpose.

The object of our invention is to provide a structure which will permit the operator in the cab to control the direction of travel without descending therefrom, thus also incidentally eliminating any requirement for an independent operator.

This object we accomplish by substituting electrically controlled steering mechanism for the wholly mechanical means heretofore employed, placing the control switches in the cab, and providing an arrangement of parts to accord with such substitution, all as will hereinafter appear.

The invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawings and the following description set forth in detail certain means embodying our invention, the disclosed means, however, constituting but one of the various forms in which the principle of the invention may be employed.

In said annexed drawings:

Figure 1 represents a side elevation of a crane having a rotatable cab and illustrating a type of crane to which our invention may be applied.

Fig. 2 represents a front elevation of such crane.

Fig. 3 represents a horizontal section of such crane constructed in accordance with our invention, and taken upon the plane indicated by line III—III, Fig. 2.

Fig. 4 represents a plan of the base or tractable member of the crane as constructed.

Fig. 5 represents a vertical section taken upon the plane indicated by line V—V, Figs. 3 and 6.

Fig. 6 represents a vertical section taken upon the planes indicated by lines VI—VI, Fig. 5.

Fig. 7 is a wiring diagram, showing the electrical connections.

The illustrated embodiment of our invention comprises the base member 1 having two laterally and oppositely disposed traction members 2—2, the rotatable cab 3 carrying the usual jib, engines, drums, etc., characteristic of this class of device, including means for rotating the cab upon its vertical axis.

The driving means include the main shaft 4, mounted horizontally and laterally upon the base 1, Figs. 2, 5 and 6, which drives the two countershafts 5—5 through the medium of pinions 6—6 and gears 7—7. Said shafts 5—5 drive the sprocket wheels 8—8 and sprocket chains 9—9 which latter drive the traction members 2—2. Pinions 6—6 are loose upon shaft 4, and are fast to clutch members 10—10, which may be engaged with or disconnected from the clutch members 11—11, which are slidable upon but rotatably fixed to shaft 4. Each pinion also has a brake drum 12 fixed thereto.

Each clutch member 11 is connected with an arm 13 of a bell crank, the other arm 13' of which is connected with a rod 14. This rod is actuated by an arm 15 fixed to an oscillatory member 16, Figs. 3 and 6. This latter member has also fixed thereto an arm 17 together with two short arms 18 and 19. These latter are connected with the brake band 20 cooperating with the drum 12. The connection between the arm 15 and the rod 14 is made flexible by the provision of a coiled spring 14', as shown, to allow said arm to be shifted when the clutch member 11 fails to immediately engage the clutch member 10, when member 11 is thrown over for the purpose of said engagement, as will be understood.

The construction thus far described is old and well known and per se forms no part of the present invention, and hence need not be described with further particularity.

It will be seen that by properly moving the arms 17 either traction member 2 may be

driven while the other is disconnected, or both may be driven or disconnected simultaneously. Also that when either clutch member 11 is disconnected, the corresponding brake is set and the corresponding traction member is locked, all as is also well known to those skilled in the art.

The desired actuation of the arms 17—17 has heretofore been effected by means of rods and hand wheels attached thereto which were mounted upon the base 1.

In our invention, however, each of these arms is actuated by solenoid core 21, Fig. 6, with which it articulates, and the actuating coils 22 of the solenoid form respectively parts of two electrical circuits 23 and 24, current for which is shown to be supplied by a common source 25, Fig. 7. These coils are suitably mounted upon the base 1 as shown. Circuit 23 includes a contact ring 26 and a brush 27 engaging same as well as a contact ring 28 and an engaging brush 29, also a switch 30 located in the cab. Circuit 24 includes a contact ring 31, engaging brush 32, the ring 28 and brush 29, and a separate switch 33, the latter being also located in the cab. As shown, the ring 28 and brush 29 may be made a common part of both circuits.

These rings are mounted concentrically with the axis of rotation of the cab and on the top of the base 1, Figs. 4 and 5, and the brushes 27, 29 and 32 are suitably mounted upon the bottom of the platform of the cab 3, as plainly shown in Figure 5.

The specific means which are provided for rotating the cab, but being of common knowledge, are not herein shown or described.

It will be seen from the above described construction that the continuity of the circuits may always be maintained independently of the rotative movement of the cab, and that the operator in the latter may control the actuation of the traction members of the cab, by properly manipulating the switches 30 and 33.

When either of the switches 30 or 33 is opened, the current from the corresponding solenoid coil is turned off and the corresponding core 21 drops by gravity, which oscillates the arm 15 in the reverse of the previously described direction, throws the corresponding brake band off its drum and moves the bell crank arm 13 so as to throw the clutch member 11 into engagement with the corresponding drum clutch member 10. This action is augmented by the provision of the coil spring 14' suitably connected with the rod 14 as shown in Fig. 6 and as will be readily understood.

What we claim is:

1. In a machine of the character described, the combination of a base member; a rotatable cab mounted upon said member; two oppositely disposed traction members for said base member; mechanism for driving said traction members; and electrically operated mechanism for controlling said driving mechanism so as to operate said traction members simultaneously or independently of each other; said electrical controlling means including a common contact ring for said operating mechanisms of said traction members and independent contact rings for said operating mechanisms, respectively, mounted upon said base member and disposed concentrically with the cab pivot, and respective cooperating brushes mounted upon said cab, including contact rings and cooperating brushes disposed concentrically with the cab pivot, and switch means located in said cab.

2. In a machine of the character described, the combination of a base member; a rotatable cab mounted upon said member; two oppositely disposed traction members for said base member; mechanism for driving said traction members; two clutches for connecting the driving mechanism with or disconnecting same from said traction members respectively; electrically operated means for actuating said clutches including contact rings mounted upon said base member concentrically with the cab pivot, cooperating brushes mounted on said cab, and switch means located in said cab.

3. In a machine of the character described, the combination of a base member; a rotatable cab mounted upon said member; two oppositely disposed traction members for said base member; mechanism for driving said traction members; two clutches for connecting the driving mechanism with or disconnecting the same from said traction members respectively; and electrically operated means for actuating said clutches and including two solenoids connected with said clutches respectively, two circuits within which said solenoids are respectively included, a common contact ring and independent contact rings for said circuits mounted upon said base member and disposed concentrically with the cab pivot, respective cooperating brushes mounted on said cab, and independently operable switches in said circuits, respectively.

Signed by us this 27th day of January, 1925.

GARDNER A. MURFEY.
ARTHUR S. MEYER.

CERTIFICATE OF CORRECTION.

Patent No. 1,688,643.

Granted October 23, 1928, to

GARDNER A. MURFEY ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 78 to 80, strike out the words and comma "including contact rings and cooperating brushes disposed concentrically with the cab pivot,"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of December, A. D. 1928.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)