July 15, 1924. 1,501,736

B. H. WHITING

ROPE GUARD FOR CRANE TROLLEYS

Filed Jan. 27, 1923 4 Sheets-Sheet 1

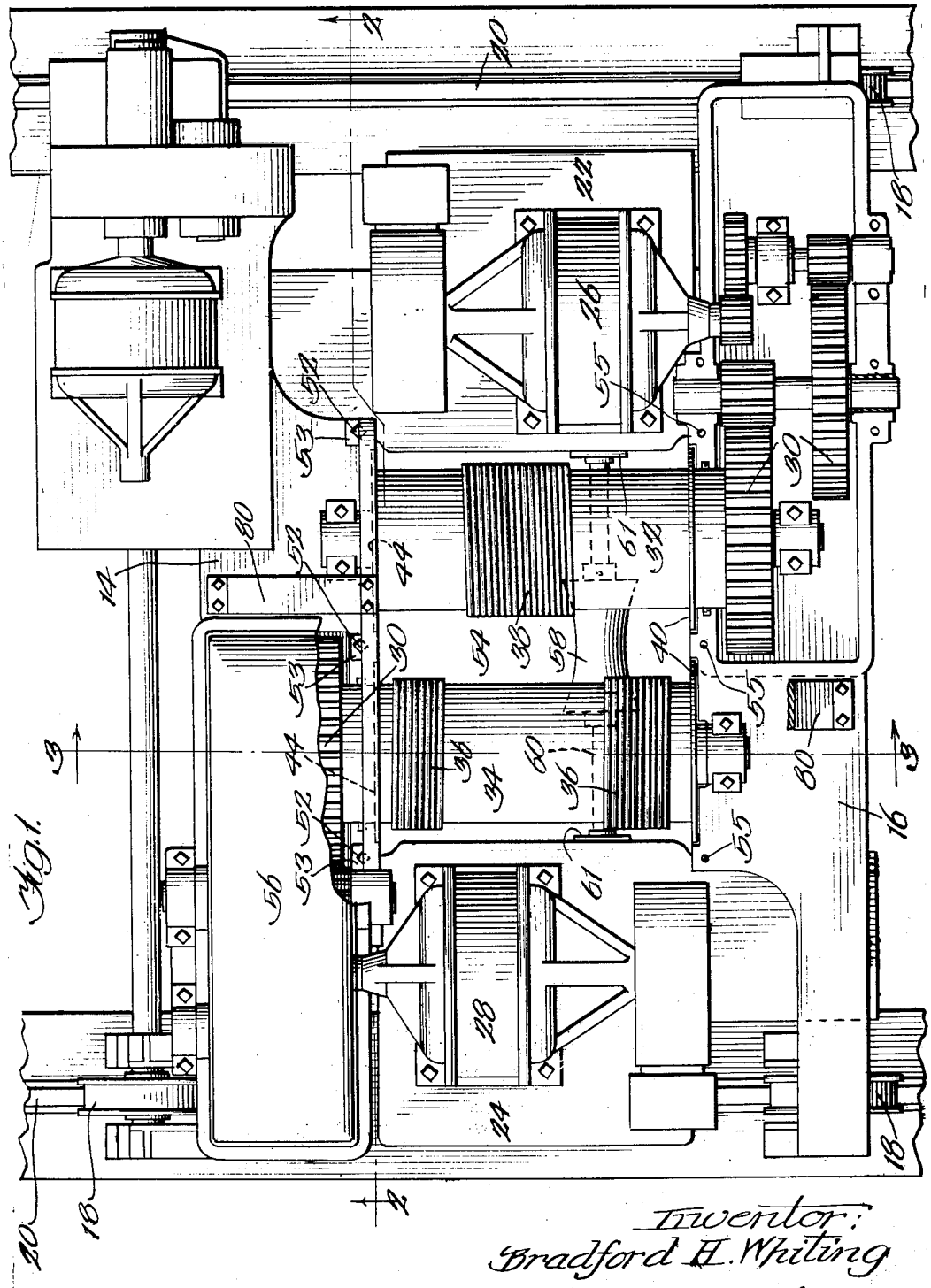


Fig. 1.

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Filed Jan. 27, 1923 4 Sheets-Sheet 2

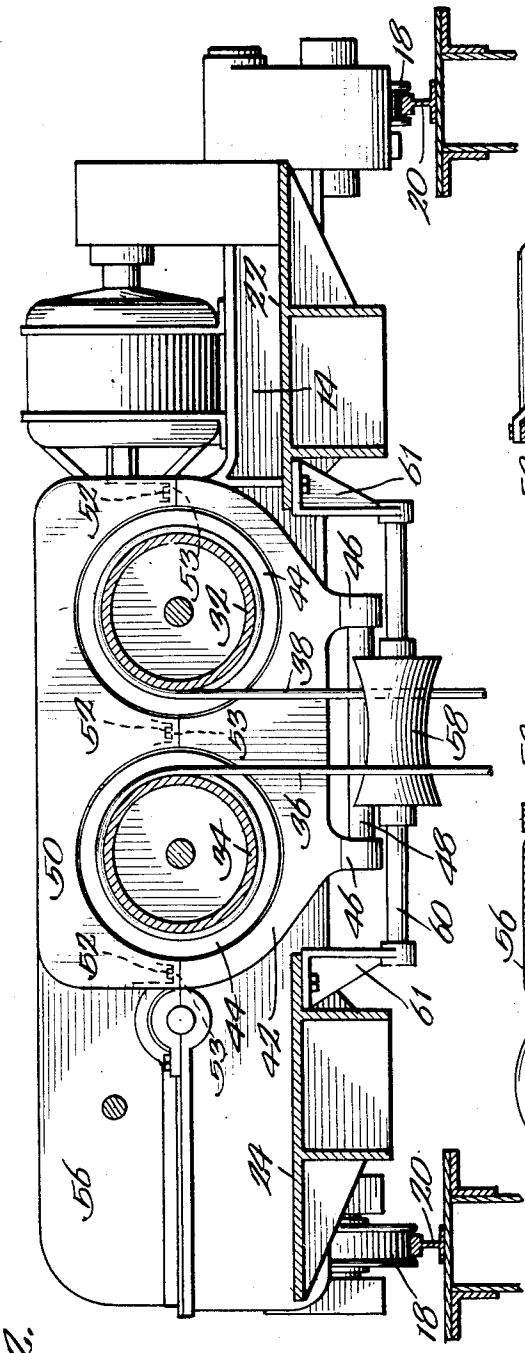


Fig. 2.

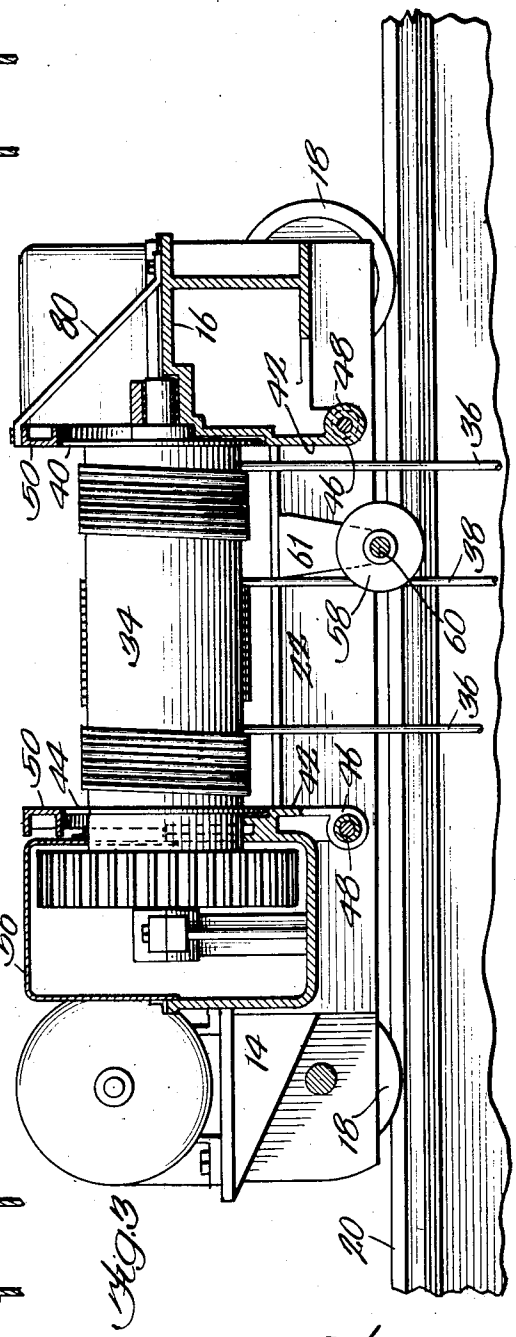


Fig. 3.

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ROPE GUARD FOR CRANE TROLLEYS

Filed Jan. 27, 1923 4 Sheets-Sheet 3

Fig. 4.

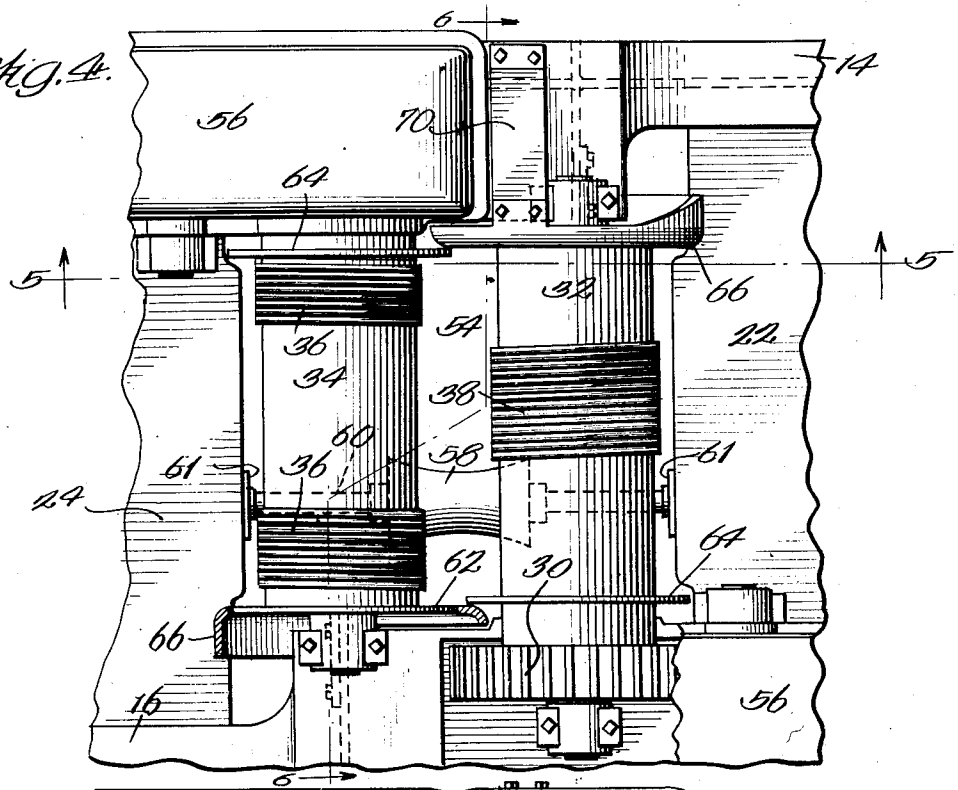



Fig. 5.

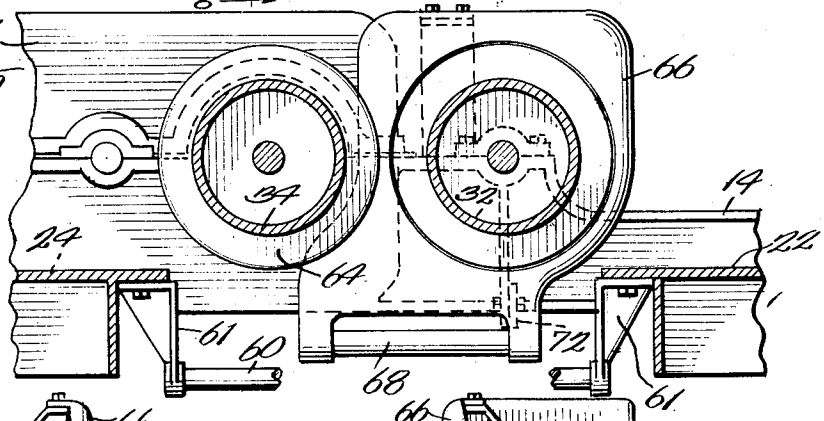
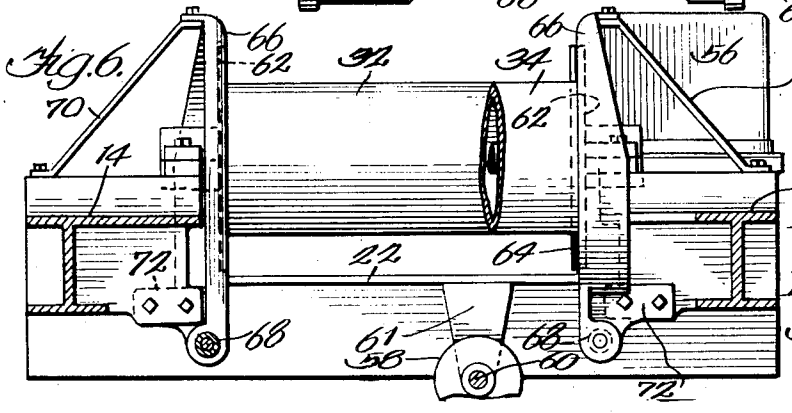



Fig. 6.




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Filed Jan. 27, 1923 4 Sheets-Sheet 4

Fig. 7.

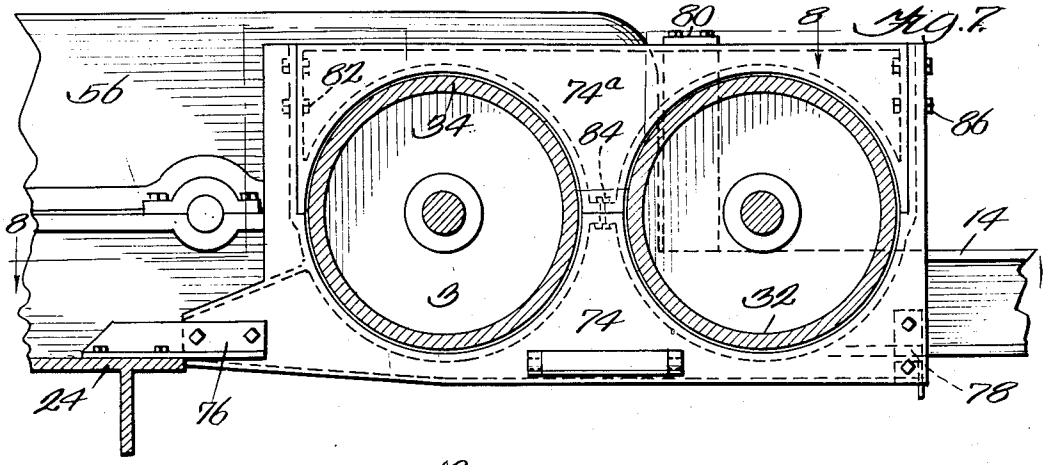



Fig. 8.

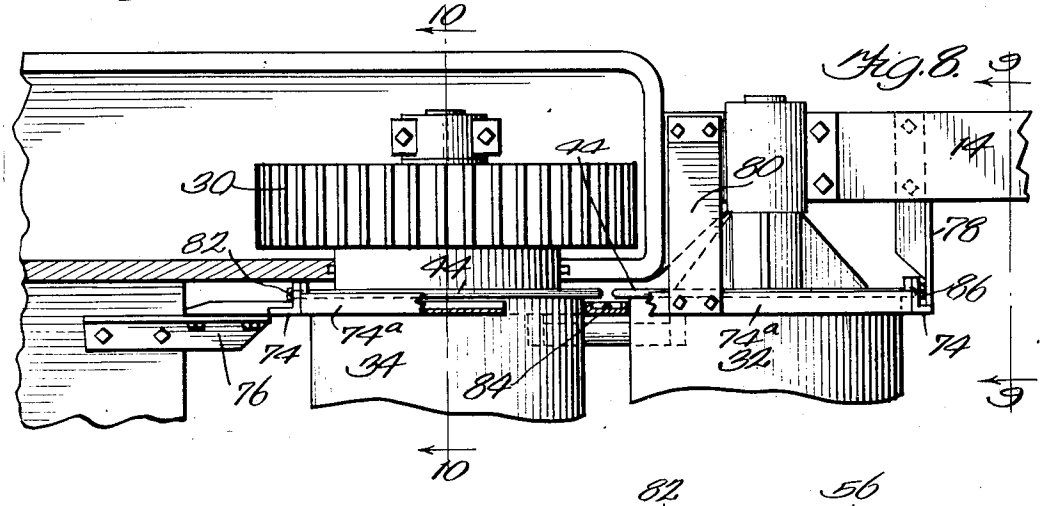



Fig. 9.

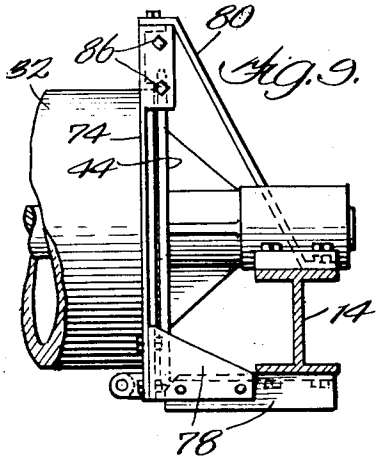
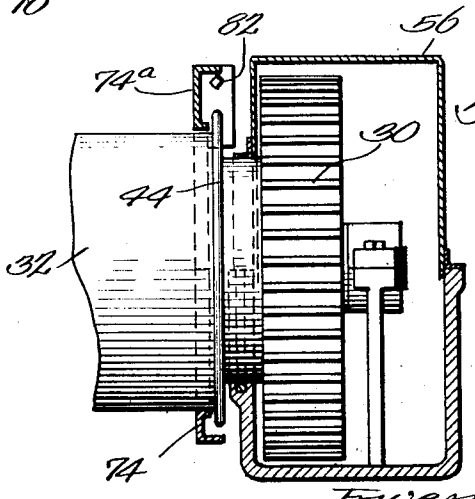



Fig. 10.




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Patented July 15, 1924. 1,501,736

# UNITED STATES PATENT OFFICE.

BRADFORD H. WHITING, OF CHICAGO, ILLINOIS, ASSIGNOR TO WHITING CORPORATION, OF HARVEY, ILLINOIS, A CORPORATION OF ILLINOIS.

## ROPE GUARD FOR CRANE TROLLEYS.

Application filed January 27, 1923. Serial No. 615,217.

*To all whom it may concern:*

Be it known that I, BRADFORD H. WHITING, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Rope Guards for Crane Trolleys, of which the following is a specification.

This invention relates to traveling cranes, especially those of the bucket type in which two sets of lifting devices with independent ropes are employed, one for elevating the bucket, the other for controlling the bucket discharging devices.

In devices of the latter class, the wire ropes employed are stiff and cumbersome with the result that when relieved of stress, as, for instance, when the bucket rests on a pile of coal, it is difficult to tell what the slack portions of the ropes will do or where they will go. The object of this invention is to provide guard devices adjacent to the rope handling drums of such a crane which will retain the loosened slack portions of the hoisting ropes adjacent to the drums in such a position that they can neither be injured themselves nor injure the hoisting mechanism. The invention consists in mechanism capable of attaining the foregoing objects, which can be easily and comparatively cheaply made and applied to cranes of this class, which is satisfactory in use and is not readily liable to get out of order. More particularly, the invention consists in many features and details of construction which will be hereafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals designate the same parts throughout the several views:

Figure 1 is a plan view of a conventional form of crane equipped with mechanism of this invention in its preferred form.

Figure 2 is a side elevation on the line 2—2 of Figure 1.

Figure 3 is an end elevation on the line 3—3 of Figure 1.

Figure 4 is a plan view of the essential parts of a crane necessary to show a modified form of this invention.

Figure 5 is a sectional side view on the line 5—5 of Figure 4 and Figure 6 is a transverse elevation on the line 6—6 of Figure 4.

Figure 7 is a side elevation corresponding to Figures 2 and 5 of still another modification of this invention.

Figure 8 is a plan view on the irregular line 8—8 of Figure 7.

Figure 9 is a sectional end view on the line 9—9 of Figure 8 and Figure 10 is a similar end view on the line 10—10 of Figure 8.

The conventional form of crane trolley (Figure 1) shows parallel side frames 14 and 16 sustained on wheels 18 traveling on tracks 20. These side frames are rigidly connected together by any suitable means not entering into this invention, as, for instance, the plates 22 and 24, each sustaining an electric motor 26 or 28, as the case may be, driving through suitable gear 30 a rope reeling drum 32 or 34 as the case may be.

In the particular case here illustrated, drum 34 is the so-called "holding drum" bearing upon its circumference two separated coils of lifting rope 36, extending downward to the conventional bucket or other load not shown. On the other hand, the drum 32—commonly referred to as the "closing drum"—carries a single winding of rope 38 leading downward to the bucket closing mechanism, not shown.

If these ropes were always tightly wound upon the drums, as shown, there would be no trouble requiring the application of this invention; but the fact is that these wire ropes, frequently cables of one inch in diameter, are so stiff and cumbersome that when released in the slightest degree by the load being taken off them, as, for instance, when the bucket in descending motion strikes the interior of a car being unloaded and can go no further, they loop up in wholly undeterminable forms between and over the drums 32 and 34 with the result that in some instances, the ropes 36 and 38 become more or less entangled together; or they fall over against the flanges 40 at the ends of the respective drums and thus cause sometimes serious trouble.

The problem solved by this invention is to so equip a crane of this class with guard devices for these ropes that the loosened portion of any given rope will be retained sufficiently near to its normal position on the drum which controls it, when the proper motor is manipulated to put that drum in

winding operation, and such loosened rope portion will return to its normal position on the drum in usual manner.

In solving this problem in the preferred manner of Figures 1–3, each trolley side 14—16 is provided with a guard plate 42, preferably but not necessarily integral with the trolley side, and recessed at 44 to receive and loosely enclose the adjacent drum flanges 40. Each plate 42 carries preferably, but not necessarily, depending lugs 46 supporting a roller 48 of such a length and position that any slack in the downwardly depending portion of the adjacent rope 36 can contact it and pass freely over it in conventional manner. Interfitting with the guard plate 42 is a removable plate member 50 recessed to enclose the upper portions of adjacent drum flanges 40 and detachably securable in position in the plane of plate 42 by any suitable means, as, for instance, bolts 52 passing through suitable lugs 53 on the side of the guard plate and holes 55 provided for them in the upper surface of the trolley side. This complete working guard plate 42—50 is made of sufficient area so that it walls in the adjacent end of the space 54 between the drums 32 and 34 as much as is necessary to prevent any normally loosened portion of rope on either drum adjacent thereto from doing damage either to the drum flanges 40 or the adjacent gear case 56 onto which such loosened rope portions might fall, but for the guard plate.

In addition to the guard plates described at opposite ends of the space 54 between the drums, one or more separating rollers 58 are preferably but not necessarily interposed across this space 54 and between different pairs of rope members 36—38. In the particular case here illustrated, this roller 58 sustained on a shaft 60, carried by suitable brackets 61, is so placed parallel with the trolley sides across the space 54 that it partitions off rope member 36 at the right hand end of drum 34 and retains it adjacent to trolley side 16 and away from all other depending ropes.

By thus separating the depending ropes below the drums and by walling in the area above the drums, the mechanism will work efficiently using the heaviest sort of stiff cables with satisfactory results.

The foregoing construction is preferable where drum flanges 40 lie in the same plane; but not all cranes are built that way. It is therefore necessary to provide an alternative construction such, for instance, as that shown in Figures 4, 5 and 6, to take care of the situation where the drum flanges here lettered 62 and 64 occupy different planes.

In the device of the last mentioned figures of the drawing, the difficulty is solved by providing a guard plate 66 which completely encases one drum flange and is engaged by the other (see particularly Figure 4) in such close relationship that there is no opportunity for either one of the ropes to pass between the guard and the adjacent drum flange. This single flange guard 66 carries below it the roller 68, corresponding to roller 48. The guard is detachably secured in place on brackets 70 and 72, suitably connected to the frame of the trolley by any suitable means.

In case for any reason it is inconvenient to form the half guard plates 42 integral with the trolley side, as heretofore described, the entire guard plate may be formed as illustrated in the second alternative construction of Figures 7 to 10, inclusive, in which the plate now designated 74 is made in a separate unit and attached to the trolley side by any convenient means as, for instance, the brackets 76, 78 and 80.

In this construction, the guard plate itself is made in two parts, the upper part $74^a$ being detachably secured to the main part of the plate by any suitable means as, for instance, the bolts 82—84—86.

The function and operation of the plates set forth in the two alternative constructions described, in connection with the trolley itself and the ropes 36 and 38, is identical with that of the preferred construction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In mechanism of the class described, in combination with trolley sides, spaced drums connecting said trolley sides, guard plates at the ends of the drums, respectively, and a roller carried by each guard plate and extending across the space between the drums.

2. In mechanism of the class described, in combination a pair of trolley sides, a pair of separated winding drums connecting the trolley sides, ropes on the respective drums capable of having more or less loose portions in the space enclosed by the drums and trolley sides, large supplemental retaining walls at the ends of the drums, and a separating roller crosswise of the drums between two ropes.

In witness whereof, I have hereunto subscribed my name.

BRADFORD H. WHITING.