

March 19, 1929.

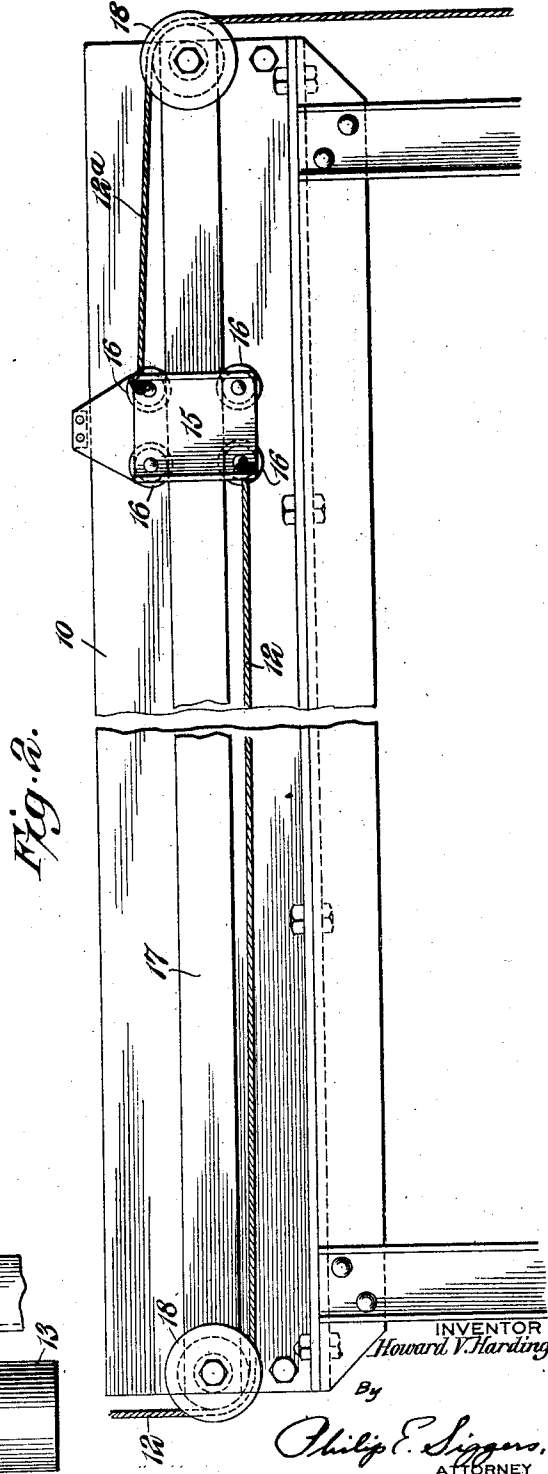
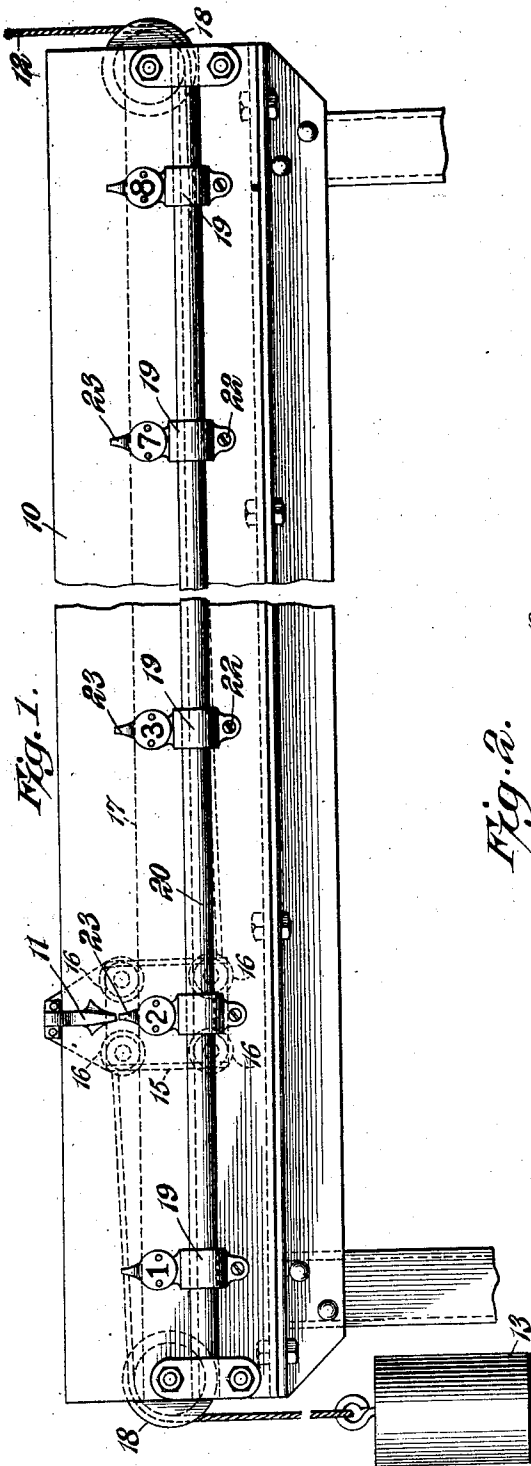
H. V. HARDING

1,705,973

INDICATOR

Filed May 27, 1927

2 Sheets-Sheet 1



INVENTOR
Howard V. Harding

By

Philip E. Siggers,
ATTORNEY

March 19, 1929.

H. V. HARDING

1,705,973

INDICATOR

Filed May 27, 1927

2 Sheets-Sheet 2

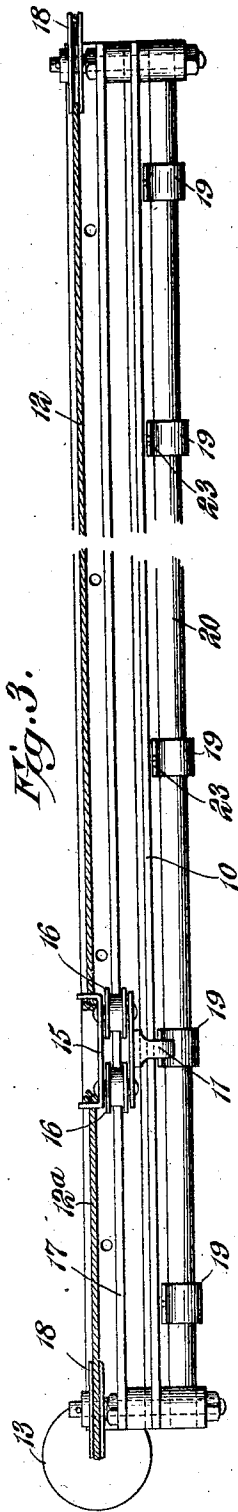
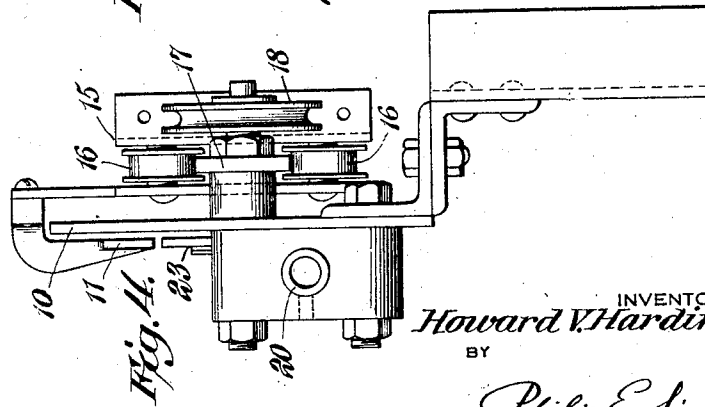
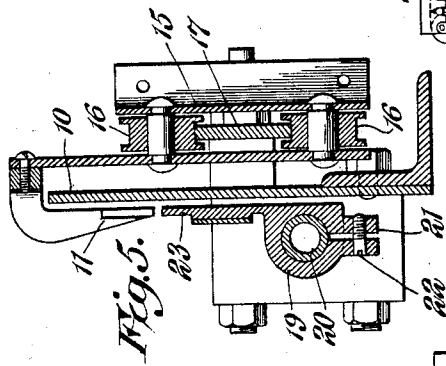
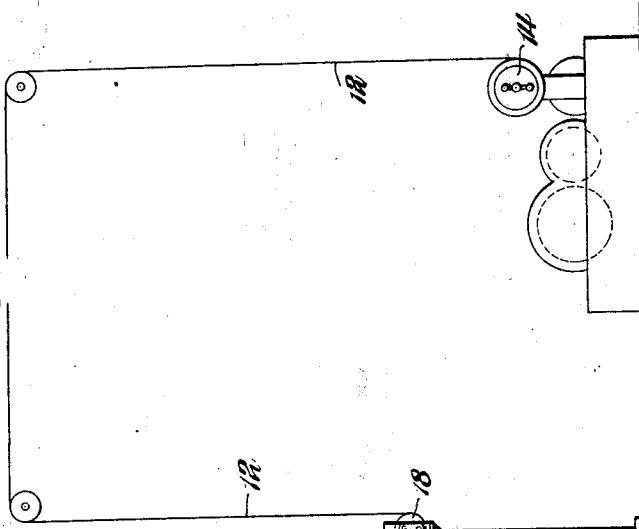


Fig. 6.



INVENTOR
Howard V. Harding,

BY

Philip E. Siggers
ATTORNEY

UNITED STATES PATENT OFFICE.

HOWARD V. HARDING, OF HUDSON, NEW YORK, ASSIGNOR TO GIFFORD-WOOD COMPANY, OF HUDSON, NEW YORK, A CORPORATION OF NEW YORK.

INDICATOR.

Application filed May 27, 1927. Serial No. 194,843.

This invention relates to indicators, and among other objects, aims to provide a reliable, accurate, smoothly-working indicator which is well adapted for use with trolley bucket conveyor installations.

In the accompanying drawings which illustrate one embodiment of the invention:

Fig. 1 is a front elevation of the indicator;

Fig. 2 is a rear elevation of the same;

Fig. 3 is a plan view;

Fig. 4 is an enlarged end elevation, looking from the right end of Fig. 1;

Fig. 5 is an enlarged section on line 5-5 of Fig. 1; and

Fig. 6 is a diagram of the preferred drawing connections for the indicator.

Referring first to Fig. 6, the preferred form of the invention has a panel 10 bearing indicia, a pointer 11 movable across the panel, a rope or cable 12 weighted as at 13, and guided by pulleys adjacent the panel, the pointer 11 being attached to the rope so as to reciprocate with it, and a mechanism 14 for moving the rope very slowly but synchronously with the device whose motion the indicator signals. Preferably the mechanism 14 is also used for actuating a pair of limit switches, as described and claimed in my copending application filed on the same day as this case, and is advantageously driven as described in my copending application filed October 27, 1926.

In a typical trolley bucket conveyor system, the bucket is lowered into a pit to receive its load and is then hoisted until it hangs just below the trolley, which is supported from an elevated monorail. The loaded bucket is then conveyed over a series of bins or silos and after being lowered into one of the bins, dumps its load automatically. Such installations are particularly designed to permit handling of a maximum amount of material at a minimum labor cost and are frequently operated by one man who stands at the motor controls and hence is unable to see the position of the bucket except when it is close by. It will be understood that if a loaded bucket were lowered so as to strike the sides of a concrete wall, the bucket might be so seriously damaged as to force shutting down of the plant, while if the bins or silos are built out of wood, the walls might be so seriously damaged that the bin could not be used until repairs had been effected. Hence the desirability of an accurate indicator which may be

placed in front of the operator and which may be depended upon to inform him when the bucket may be safely lowered. It is also desirable so to construct the indicator that it may be adjusted to suit conditions at each installation. This is necessary because the location and spacing of bins and silos usually varies with each installation, depending upon the amount of ground which is available, the capacity of the plant, the materials to be handled and other factors. The present invention provides a standardized indicator which may be arranged to suit conditions at almost any commercial installation of a trolley bucket conveyor.

Referring again to the drawings, the pointer 11 is shown attached to a carriage 15 provided with wheels 16 for supporting and guiding the carriage as it moves along a monorail 17 fixed back of the panel 10. One end of the rope 12 is attached to the carriage 15 as shown in Fig. 2. Preferably the rope 12 is divided into two parts, the part 12^a being attached to the carriage 15 and extending over a guiding pulley 18 to the weight 13. Thus the rope 12 is maintained under constant tension throughout its entire length, and reciprocates synchronously with the movement of the mechanism 14.

To indicate the stations at which the bucket is to be hoisted and lowered a series of indicia 19 is carried in front of the board, preferably on a rod 20, each indicium being individually adjustable on said rod. As shown in Fig. 5, each indicium is split as at 21 and has a clamping screw 22 at right angles to the split so that it may be clamped securely on the rod. To make the indicia readily distinguishable from each other, each may carry a symbol, such as a numeral, as shown in Fig. 1. For more accurate determination of the position of the bucket, the indicia may have pointed extensions 23 which the end of the pointer 11 closely approaches as the pointer travels over the indicia. This is advantageous because the movement of the pointer is very greatly reduced as compared with the movement of the bucket and any refinement in the determination of the movement of the pointer will aid in the precise location of the bucket and will tend to prevent damage to the bucket.

When the indicator is first set, the number of indicia to be placed upon the rod 20 will be selected to correspond with the number of

bins or stations at which the bucket is to stop from time to time. The spacing of the indicia will be determined empirically. If through stretching of the rope 20, or from other causes, it should later develop that the indicia are not properly located, any one or all of them may be easily relocated by merely loosening the corresponding screws 22 and moving them a short distance on the rod 20 and tightening the screws again.

Obviously the present invention is not restricted to the particular embodiment thereof herein shown and described. Moreover, it is not indispensable that all the features of the invention be used conjointly, since they may be employed advantageously in various combinations and sub-combinations.

What I claim is:

1. An indicator comprising, in combination, a rope; a speed reducing mechanism to effect reciprocation of the rope responsive to movements of the device whose motion is to be signaled; a pointer connected with the rope; means for guiding the pointer in its travel; a support; and a series of indicia on the support, each indicium being individually adjustable on the support to adapt the indicator to the conditions of an installation.

2. An indicator comprising, in combination, a support; a track secured to the support; a carriage having wheels supporting and guiding it along the track; a pointer secured to the carriage; a series of indicia on

the support; and means connecting the carriage with the device whose motion is to be signaled, transmitting power from said device to the carriage to cause the pointer to travel synchronously with said device.

3. An indicator comprising, in combination, a support; an extensible, flexible, power-transmitting member connecting the pointer with a speed-reducing mechanism which is adapted to be driven simultaneously with the device whose travel is to be indicated; a pointer movable over the support; a rod secured to the support; a series of indicia-bearing elements on the rod; each element being clamped to the rod and being movable individually along the rod; each element having a pointed extension directed toward the path of the pointer.

4. An indicator comprising, in combination, a support; a rod secured to the support; a series of indicia on the rod; each indicium being clamped to the rod and being adjustable individually; a monorail; a carriage having upper and lower wheels engaging the monorail for travel thereon without wobbling; a pointer secured to the carriage; and means connecting the carriage with the device whose motion is to be signaled, transmitting power from said device to the carriage to cause the pointer to travel synchronously with said device.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

HOWARD V. HARDING