

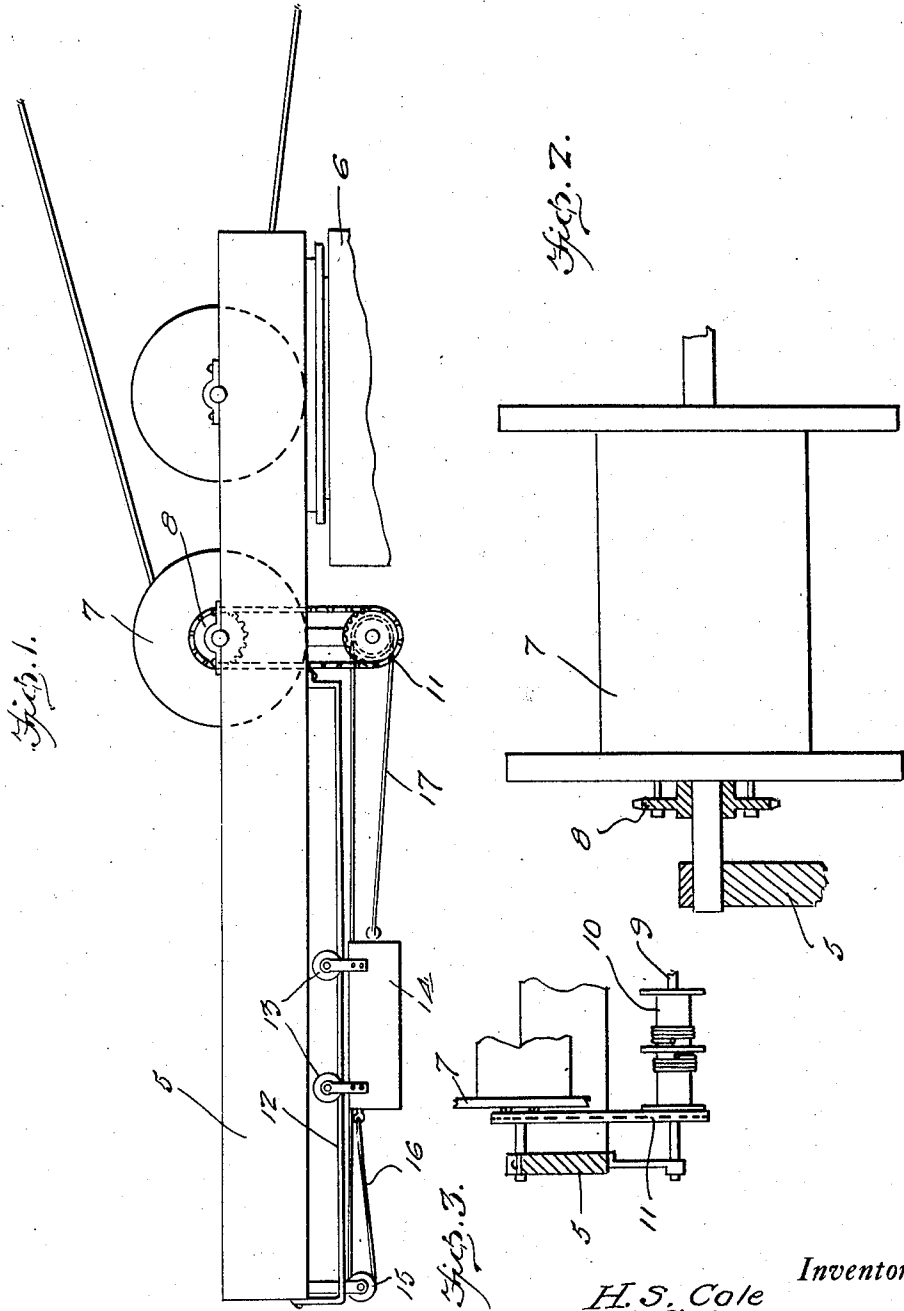
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DRAG LINE EXCAVATOR COUNTERBALANCE

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UNITED STATES PATENT OFFICE.

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DRAG-LINE-EXCAVATOR COUNTERBALANCE.

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This invention relates generally to excavators of the drag line type, and has more particular reference to a counter-balance for the revolving frame thereof for preventing tilting and bucking of the excavator during operation.

It is well known, that the load which a drag line excavator carries is greatly variable. To always have the machine set steady the counter-balance must vary accordingly. A drag line first lifts its load near the base of the boom close to the center of gravity, and as it is hoisted toward the upper end of the boom, the same recedes from the center of gravity placing the machine under an increased load, resulting in a tendency of the machine to tip.

The invention aims to overcome such a disadvantage by providing a counter-balance that is automatically operable during the operation of the machine, mechanism being provided whereby the counter-balance would recede from the machines, center of gravity, at the same time as the load is lifted, but in the opposite direction from the load, thereby making a much more perfect balance and eliminating the tendency to tip.

Attempts have been made to overcome the tipping of such excavators through the medium of a stationary weight, which have not proven satisfactory, and it is therefore an object of the invention to obtain a steady balance at all times under all conditions and all loads.

In the drawing wherein like reference characters indicate corresponding parts throughout the several views:—

Figure 1 is a side elevation of a drag line excavator revolving frame together with certain of its associated excavator structural elements with which is associated a counter-balance constructed in accordance with the present invention.

Fig. 2 is a view in side elevation of the usual hoist drum of the excavator that is provided in this instance, with means for facilitating the operation of the counter-balance during the operation of said drum, and

Fig. 3 is a similar view on a smaller scale, disclosing the specific means for operating the counter-balance that has driving connection with said hoist drum.

Now having particular reference to the drawing, 5 indicates a revolving frame of a conventional type of drag line excavator that revolves upon the conventional base 6

and suitably journaled within which rearwardly of said base, is the usual hoist drum 7.

In carrying out the present invention, I provide said hoist drum at its outer side with a detachable multi-part sprocket wheel 8, while suitably journaled in spaced parallel relation with said drum is a shaft 9 keyed on which is a double cable drum 10, upon the outer end of which is also a detachable multi-part sprocket gear 11 directly beneath the gear 8 of the hoist drum 7. A suitable sprocket chain is trained over the alining sprocket wheels or gears. The detachable sprocket gears 8 and 11 are an easy means of regulating the distance the counter-balance will move.

Mounted upon the under side of the revolving frame 5 rearwardly of the shaft carrying drum 10 and in spaced horizontal relation therewith, is a track 12 upon which ride the rollers 13—13 carried by a relatively greatly weighted counter-balance 14.

At the rear end of the track 12 is a pulley 15 over which is trained a cable 16, one end of which is connected to the weight 14 and then extends rearwardly over the pulley, and thence forwardly around one side of the double drum 10. Secured to the front end of the weight 14, is another cable 17 that passes around the other side of the drum 10 in a reverse direction as clearly shown in Fig. 3, in order that a rotation of the drum in one direction will cause a movement of the counter-balance in a forward direction, where a reversal of the drum will cause the reverse movement of said counter-balance, which movement is controlled by the operation of the hoist drum 7 for equalizing the weight on directly opposite sides of the center of gravity during the operation of the excavating unit.

It will thus be seen that I have provided a highly novel, simple and efficient form of counter-balancing means for drag line excavators that is well adapted for all of the purposes heretofore designated and that is of such a nature as to permit the ready installation of the same upon all conventional forms of drag line excavators.

Minor changes may be made in the invention without departing from the spirit and scope of the appended claim.

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

In combination with the revolving frame of a drag line excavator, including the usual hoist drum, a counter-balancing means therefor comprising a shaft supported on the
5 frame below the hoist drum, a double cable drum keyed on said shaft, alining sprocket wheels secured on the ends of the drums, a sprocket chain trained over said sprocket
10 wheels, a track arranged longitudinally on the bottom of the outer portion of the revolving frame, a weighted counter balance, rollers carried by the latter and adapted to travel on said tracks, a pulley mounted at
the rear end of the track, a cable attached at

one end to the rear end of the counter bal- 15
ance, said cable being trained over the pulley and thence disposed forwardly and attached to one of the double cable drums and an additional cable secured to the forward end of
the counter balance and attached at its op- 20
posite ends to the other of the double cable drums whereby the weight upon the opposite side of the machine's center of gravity during its operation will be equalized.

In testimony whereof we affix our signatures. 25

HARVEY S. COLE.
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