

**Oct. 18, 1927.**

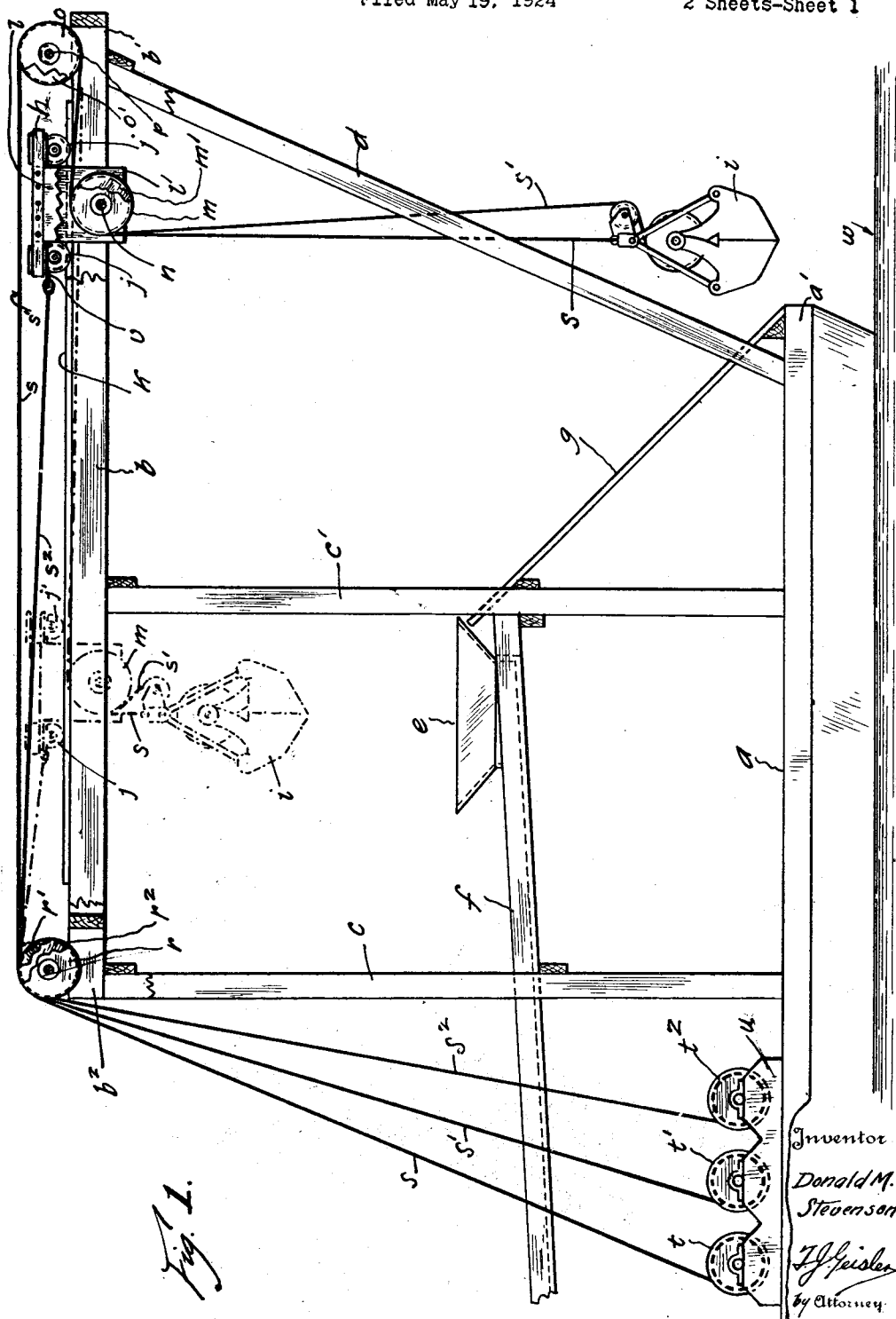
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**1,646,119**

## LOAD MOVING AND RAISING AND LOWERING MEANS

Filed May 19, 1924

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

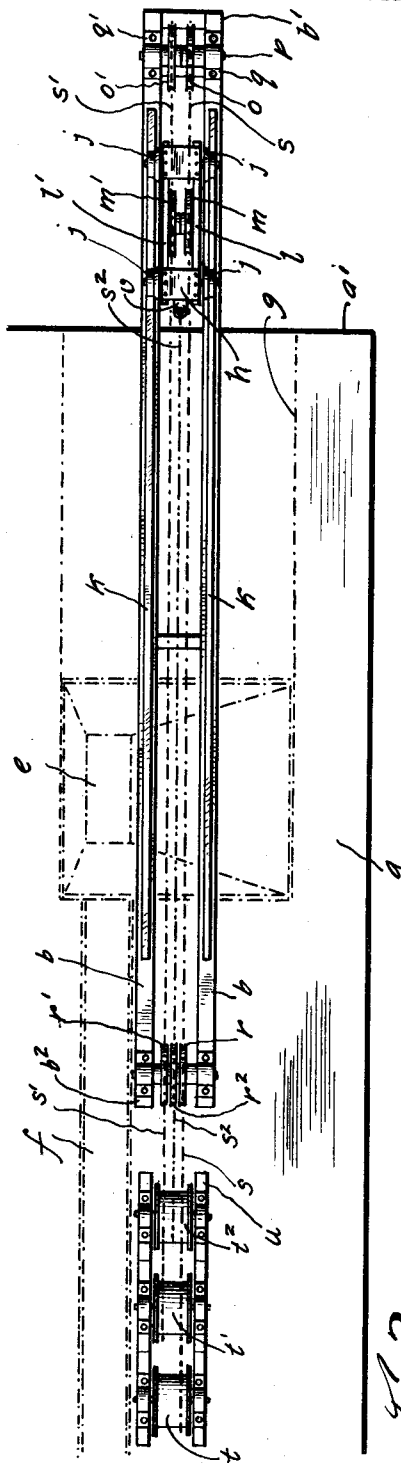
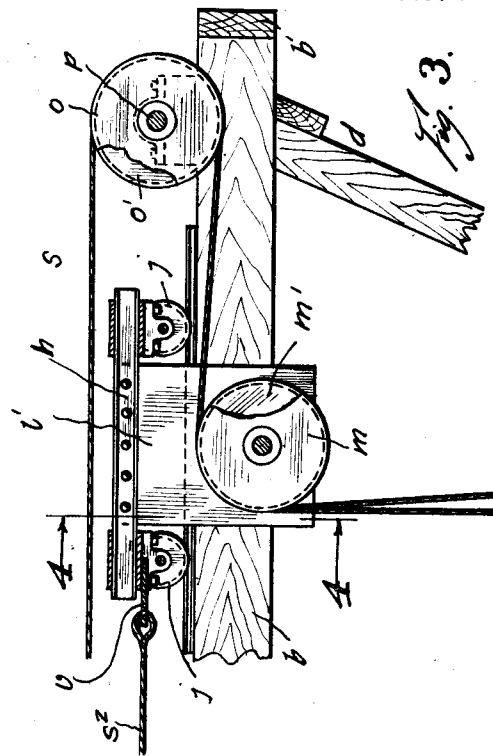


Fig. 2



3.

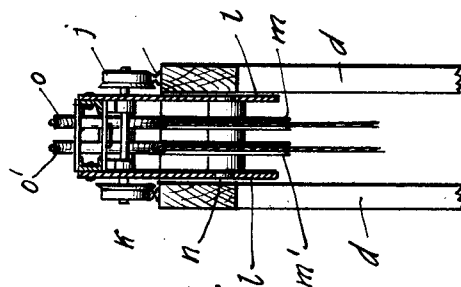


Fig. 4.

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## UNITED STATES PATENT OFFICE.

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## LOAD MOVING AND RAISING AND LOWERING MEANS.

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The object of my invention is to provide simple means for operating a bucket especially one of the clam shell type, such means being adapted to place the bucket in and out of its load receiving position, and thence into and out of its load discharging position, and also to open and close the bucket.

My further particular object is, to move the bucket into and from its load discharging position by a cable having opposite ends arranged to make an angle with each other; to suspend the bucket from the pendent end of said cable, and then to move the vertex of the angle of said cable horizontally, thereby relatively to shorten and to lengthen said pendent leg or side of said cable, and thus raise and lower the bucket to and from its load receiving station.

I attain my object in devices consisting of a frame supporting an overhead way with the latter extended horizontally a substantial distance beyond the base on which said frame is mounted. Under said elevated way, and intermediate its ends, I provide an elevated load-receiving station. A carriage runs on said way and is provided with a sheave. A cable is led over said sheave towards one end of said way with the ends of the cable arranged in angular position as mentioned. Means are provided for moving said carriage along said way relatively to said end of the latter, thereby relatively to shorten and lengthen the pendent end of said cable suspending said bucket, and thus raise and lower the latter to and from its discharging position.

The details of my invention are hereinafter fully described with reference to the accompanying drawings, showing my invention as embodied in a dredge.

In said drawings:

Fig. 1 is a diagrammatic side elevation of a scow provided with my invention;

Fig. 2 is a plan or top view of the overhead way and the devices thereby supported also showing the hopper provided at the discharging station;

Fig. 3 is an enlarged sectional detail of the projecting end of said overhead way showing the carriage thereon mounted; and

Fig. 4 is a sectional detail taken on the line 4-4 of Fig. 3.

My device is adapted to be mounted on a base *a*. For the purpose of illustration, I am showing it mounted on a scow although

it is equally adaptable to be mounted upon the end of a pier or any other stationary base.

An elevated way *b* is mounted above said base *a* and one end *b'* extends a substantial distance beyond its extremity *a'*. The elevated way *b* is supported by two vertical members *c* and *c'* and by a strut *d*, which is inclined at an angle to the vertical plane. The strut *d* supports the extremity *b'* of the elevated way, and the lower end of said strut is supported by the extremity *a'* of the base. I provide an elevated load receiving station or hopper *e* which lies between the elevated way *b* and the base *a*. This elevated load receiving station or hopper extends some distance back from the extremity *a'* of the base *a*, and it is the mouth for the conveyor chute *f* which is inclined angularly with the horizontal plane. The chute has sufficient pitch to permit the material deposited in the hopper to spill down the chute to a convenient collecting station. A spill way or fender *g* fastened at its ends to the hopper *e* and the extremity *a'* of the base, serves to deflect away from the base, any material which is dropped from the bucket.

A carriage *h* rides on the elevated way *b* and is adapted to run from a point above the digging position of the bucket *i*, to a point above the mouth of the hopper *e*. The carriage *h* is mounted on four flanged wheels *j* which run on the track *k* mounted on the elevated way. Two pendent plates *l* and *l'* are mounted on the carriage, one on each side, and are spaced apart and two sheaves *m* and *m'* are journaled on a shaft *n* which is fixed between the two pendent plates *l* and *l'*. These sheaves are permitted rotation independently of each other. Sheaves *o* and *o'* are mounted at the extremity *b'* of the elevated way *b* and are spaced apart and are alined with the sheaves *m* and *m'* on the carriage *h*. Said sheaves *o* and *o'* are mounted on the shaft *p* which is journaled in spaced bearings *q* and *q'* mounted on the elevated way *b*. On the other extremity *b<sup>2</sup>* of the elevated way *b* I mount three sheaves *r*, *r'* and *r<sup>2</sup>*. The sheave *r* is alined with the sheaves *m* and *o*, the sheave *r'* alined with the sheaves *m'* and *o'*, and the sheave *r<sup>2</sup>* lies between the sheaves *r* and *r'*.

I provide three cables *s*, *s'* and *s<sup>2</sup>* which are controlled by drums *t*, *t'* and *t<sup>2</sup>* respectively, mounted on a common base *u*, the

drums being in close proximity and thus arranged so that all may be controlled by a single operator.

The cable *s* is lead from the drum *t* over the sheave *r*, around said sheave *o*, and from its under surface back over the sheave *m*. This cable is the hoisting cable and its end is attached to the bucket *i*. Thus by lifting said cable, the bucket is lifted vertically.

The cable *s'* is lead from the drum *t'* over the sheave *r'* around the sheave *o'* and from the under surface thereof back over the sheave *m'* and its extremity is fastened to the operating mechanism of the bucket *i*. This cable is adapted to open and close the bucket as it is drawn in or paid out. The cable *s<sup>2</sup>* is lead from the drum *t<sup>2</sup>* over the sheave *r<sup>2</sup>* and its extremity is fastened to the link *u* on the carriage *h*. The drawing in and paying out of this cable is adapted to pull the carriage *h* to and fro along the elevated way *b* and in doing so, to lengthen and shorten the pendent ends of the cables *s* and *s'*. The lengthening and shortening of these ends also tends to move them horizontally and thus the bucket is lifted from its position, shown in full lines in Fig. 1, to the position shown in dotted lines superimposed above the mouth of the hopper *e*.

The operation of my device is as follows: The elevated way *b* overlies the elevated hopper *e* and extends beyond the extremity *a'* of the base *a*. Thus the carriage is permitted to move from a position over the mouth of the hopper *e* to a position beyond the extremity of *a'* of the base *a*, to permit the bucket also to be moved from a position over the hopper *e* to a position beyond the extremity *a'* of the base which is the normal digging position of the bucket. With the bucket in the position shown in dotted lines, the cable *s<sup>2</sup>* is paid out by the drum *t'*, and the weight of the bucket *i* forces the carriage *h* outwardly along the overhead way *b* and the bucket moves correspondingly outwardly and also downwardly due to the lengthening of the pendent end of the cables *s* and *s'*. When the carriage *h* moves outwardly to the extremity *b'* of the overhead way *b*, the bucket will clear the extremity *a'* of the base *a*, and thus may be lowered vertically into digging position in the body of water *w* on which the scow floats.

The bucket *i*, which is shown, is a standard clam shell bucket and thus when the bucket nears its digging position, the operating or tripping cable *s'* is slackened and this permits the jaws of the clam-shell bucket to open so that it will be in position to be filled. The bucket is then lowered into digging position and the operating or tripping cable *s'* is made taut and this causes the bucket *i* to close. The cables *s* and *s'* are then hauled in by the drums *t* and *t'* respectively at a uniform rate, and are lifted vertically to the position shown in full lines in Fig. 1. The drums *t* and *t'* are then stopped and the cable *s<sup>2</sup>* is drawn in by the drum *t<sup>2</sup>*. This moves the carriage *h* along the elevated way and shortens the pendent end of the cables *s* and *s'* and moves the bucket *i* upwardly and inwardly at an angle of 45° over the spillway *g* and to a position above the hopper. The jaws of the bucket are then tripped, the material is dumped into the hopper *e* and the material will then run down the chute *f* and the bucket can then be returned to be refilled.

I claim:

A digger bucket operating mechanism apparatus, a support, an overhead-way mounted thereon one end of the way projecting beyond the support, and the opposite or inner end of the way being located on the support, a carriage running on said way, a double sheave carried by the carriage, a double sheave mounted on the way at its said projecting end, triple sheaves mounted on the inner end of the way, triple drums, a cable connected to one drum thence extending over the sheaves located at the inner end of the way and connected to said carriage, a pair of cables connected to other drums respectively thence led respectively over the other two sheaves located at the inner end of the way, thence over the sheaves located at the projecting end of the way, down and back to, and over the sheaves carried by the carriage, a bucket of the clam-shell type suspended from one of the last mentioned cables, the bucket provided with means for opening and closing the same, and the other of the last mentioned cables being secured to said bucket opening and closing means.

DONALD M. STEVENSON.