Jan. 4, 1955 J. A. BARNHART 2,698,691

TOY CLAM SHELL DREDGE

Filed Sept. 3, 1953 2 Sheets-Sheet 1

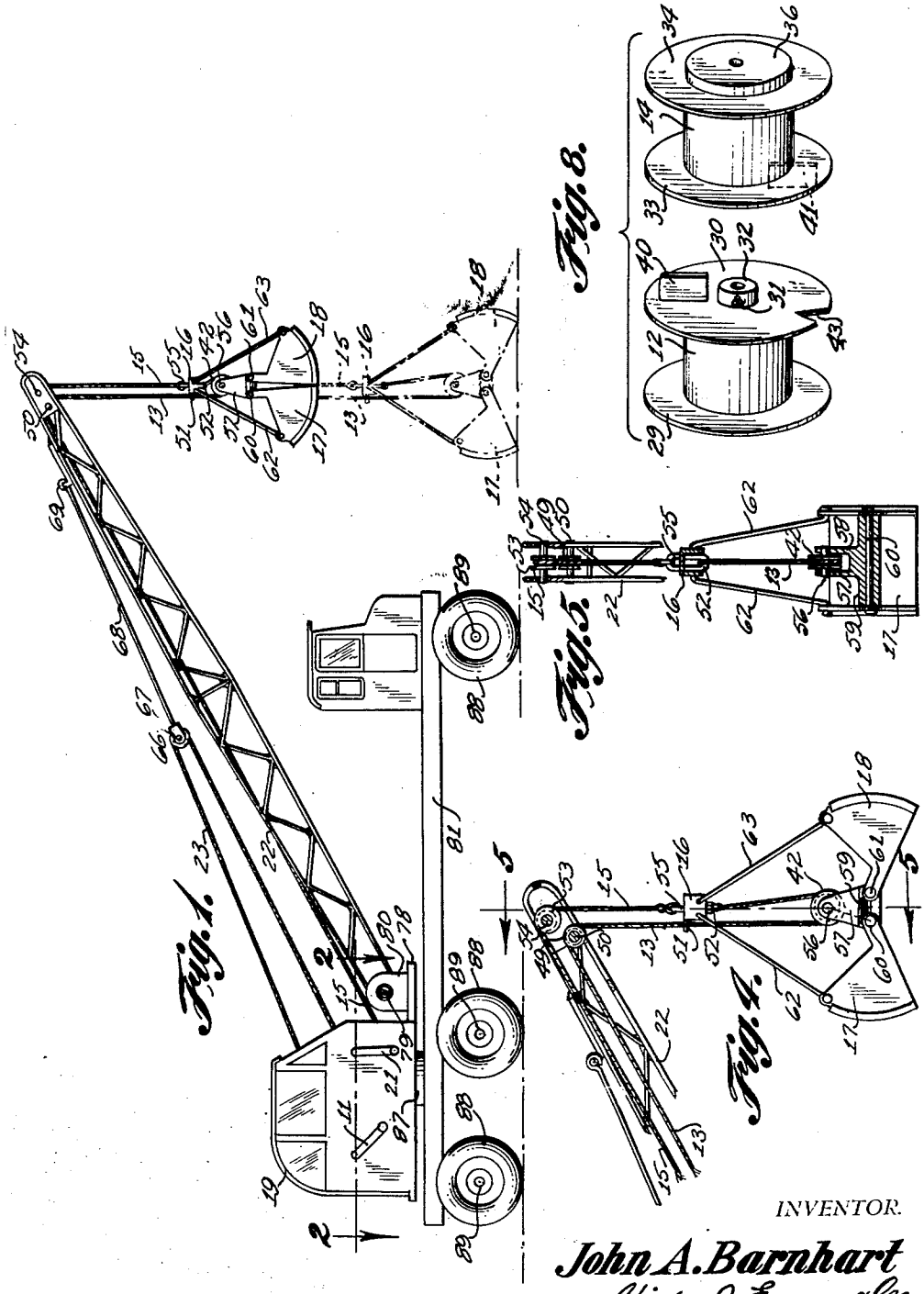


Fig. 1.

Fig. 3.

Fig. 5.

Fig. 4.

INVENTOR.

John A. Barnhart

BY Victor J. Evans & Leo.

ATTORNEYS

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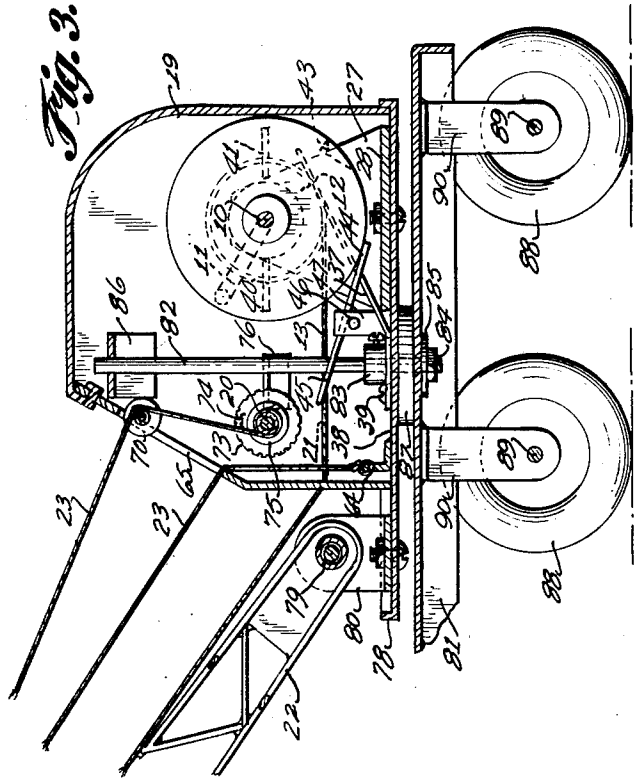


Fig. 3.

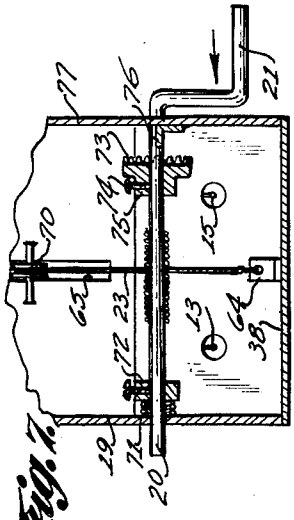


Fig. 7.

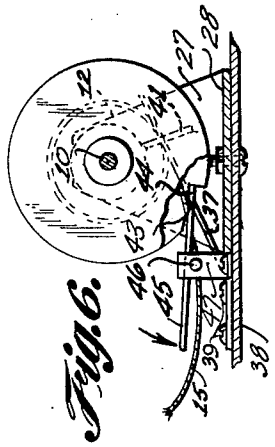


Fig. 6.

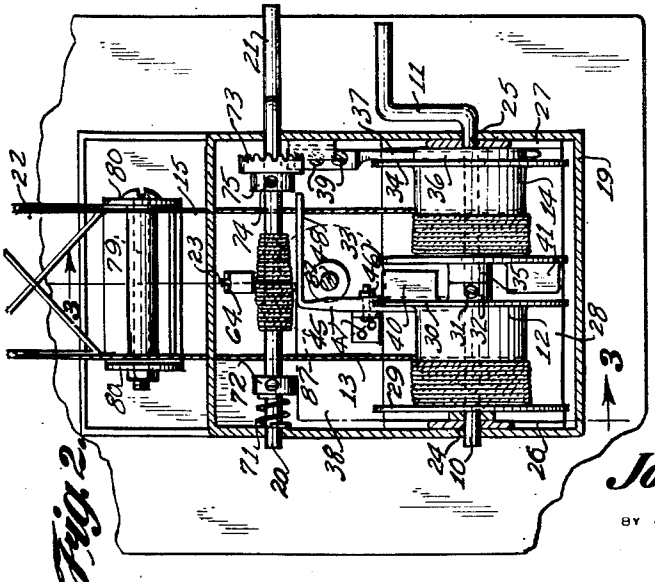


Fig. 2.

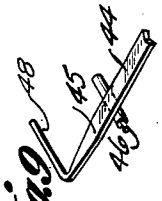


Fig. 9

INVENTOR.

John A. Barnhart

BY Victor J. Evans & Co.

ATTORNEYS

United States Patent Office 2,698,691 Patented Jan. 4, 1955

2,698,691

TOY CLAM SHELL DREDGE

John A. Barnhart, La Porte, Ind.

Application September 3, 1953, Serial No. 378,341

1 Claim. (Cl. 212—44)

This invention relates to winches or cable control and operating drums particularly as used for actuating clam shell buckets and hoists, and in particular operating instrumentalities including a pair of drums mounted on a common shaft with one of the drums fixed to the shaft and actuated by a crank extended from one end of the shaft and with the other drum which is freely mounted on the shaft, frictionally retained in a stationary position with a spring finger and rotated after one complete revolution of the drum fixedly mounted on the shaft by engagement of a lug extended from the fixedly mounted drum with a lug extended from the freely mounted drum, and in order to prevent fouling of cables from the drums the device is provided with a latch for preventing rotation of the drums as soon as slack develops in one of the cables.

The purpose of this invention is to provide means for operating a clam shell bucket depending from the end of a boom whereby a crank on the end of a shaft is rotated through one revolution of the shaft with the bucket in an upper position at the end of the boom to close the jaws of the bucket, and wherein with continued movement of the crank in the same direction the bucket is lowered until it strikes material to be picked up thereby, at which time the crank is rotated through one revolution in the opposite direction, which closes the jaws of the bucket, and with continued movement of the crank in the same direction the bucket is elevated, with the jaws closed, to a position at the upper end of the boom.

In the conventional manner of operating clam shell buckets for this use drums are provided on a plurality of shafts with the shafts actuated by gears and clutches whereby one shaft is held while the other is rotated and by this means the jaws of a bucket and also the bucket may be actuated. For use in toy machinery of this type this is too costly and with this thought in mind this invention contemplates means for operating and holding cables to obtain different movements in machinery and equipment suspended by the cables wherein parts, such as a clam shell bucket may be opened and closed and raised and lowered with a common crank.

The object of this invention is, therefore, to provide means for holding a drum from which a hoisting cable extends while another cable is actuated to open and close a bucket suspended by the hoisting cable.

Another object of the invention is to provide a toy clam shell hoist having a latch for automatically holding the drum to prevent fouling of the cables.

A further object of the invention is to provide a clam shell bucket operating hoist adapted to be used as a toy in which the device is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies a boom pivotally mounted on a rotatable platform of a chassis provided with wheels with a clam shell bucket suspended and actuated by cables extended from the bucket over sheaves in the end of the boom to drums in a cab on a rotatable platform, with a hoisting cable extended from a drum freely mounted on a shaft, a bucket opening and closing cable extended from a drum fixedly mounted on the same shaft, and with a boom raising and lowering cable extended to a second shaft in the cab.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is a side elevational view showing a clam shell bucket suspended from a boom of a hoist device with the bucket shown in the closed position in full lines and in an open position in broken lines.

Figure 2 is a sectional plan through the cab of the hoist with the parts shown on an enlarged scale, taken on line 2—2 of Figure 1, illustrating the general arrangement of the drums, latch, and a spring finger which retains the freely mounted drum in an inoperative position during opening and closing movements of the bucket.

Figure 3 is a longitudinal section through the cab taken on line 3—3 of the Figure 2.

Figure 4 is a longitudinal section through the outer end of the boom with the parts shown on an enlarged scale and showing the bucket in the open position.

Figure 5 is a vertical section through the boom and bucket being taken on line 5—5 of Figure 4.

Figure 6 is a detail showing a section taken substantially on line 3—3 of Figure 2 illustrating a latch for holding the drum fixedly mounted on the shaft when slack develops in the hoisting cable to prevent fouling of the cables.

Figure 7 is a longitudinal section through the cab taken substantially on the center of the shaft for raising and lowering the boom.

Figure 8 is an exploded view illustrating the fixedly mounted and freely mounted drums which are adapted to receive the bucket opening and closing cable and hoisting cable, respectively.

Figure 9 is a perspective view of the holding lever.

Referring now to the drawings wherein like reference characters denote corresponding parts the hoist device of this invention includes a shaft **10** having a crank **11** extended from one end with a drum **12** for a bucket opening and closing cable **13** fixedly mounted on the shaft, and a drum **14** for a hoisting cable **15** freely mounted on the shaft, the cables **13** and **15** extending to a pulley block **16** of a clam shell bucket having jaws **17** and **18**, and the shaft **10** is mounted in a cab **19**, in which a shaft **20** with a crank **21** on one end for raising and lowering a boom **22** with a cable **23**, is also mounted.

The shaft **10** is journaled in bearings **24** and **25** of end plates **26** and **27**, respectively of a frame having a base **28** and, as illustrated in Figure 2, the drum **12**, which is provided with flanges **29** and **30** is secured to the shaft **10** with a set screw **31** that is positioned in a hub **32** on one end of the drum.

The drum **14** is provided with similar flanges, as indicated by the numerals **33** and **34** and this drum is provided with a hub **35**, at one end and a hub **36** at the other. The hub **36** is positioned to be engaged by a spring finger **37** that is secured on the floor **38** of the cab with screws **39**.

The spring finger **37** holds the drum **14** in a stationary position to retain the bucket in an upper position as jaws thereof are opened and closed and, also holds the bucket in a stationary position as the jaws of the bucket are closed with the bucket in the lower position as indicated by the broken lines in Figure 1.

The flange **30** of the drum **12** is provided with a lug **40** and, as shown in Figures 2 and 8 a similar lug **41** extends from the flange **33** of the drum **14** whereby the lug of the drum **12** is positioned to engage the lug of the drum **14**.

With the lugs **40** and **41** of the drums **12** and **14**, respectively, positioned in this manner the drum **12**, which is fixedly mounted on the shaft **10** is rotated by the crank **11** through a complete revolution, in a clockwise direction, looking toward the end of the cab on which the crank **11** is positioned whereby the cable **13** draws a sheave **42**, as shown in Figure 4, upwardly to close the jaws and, after the jaws are closed the lug **40** picks up the lug **41** and rotates the drum **14** in the same direction whereby the cable **15** is actuated to draw the bucket upwardly, the jaws being held closed by the cable **13** which continues to be operated in this movement.

When the bucket has traveled upwardly until the block **16** engages the lower side of the boom, the crank **11** is rotated in a counter-clockwise direction wherein, with the spring finger **37** holding the drum **14** the drum **12** unwinds the cable **13** permitting the sheave **42** to drop

downwardly by gravity to the position shown in Figure 4 whereby the jaws are opened. As soon as the bucket is opened the lug **40** again picks up the lug **41** causing the drum **14** to rotate to unwind the cable **15** whereby the bucket drops downwardly by gravity to the position shown in broken lines in Figure 1. With the bucket in this position it is adapted to scoop up material and, repeating the cycle, the drum **12** is rotated by the handle or crank **11** with the spring finger **37** holding the drum **14** in a stationary position until the jaws of the bucket are closed by upward movement of the sheave **42**, and at this time the lug **40** again picks up the lug **41**, rotating the drum **14** to wind the hoisting cable **15** therein.

The flange **30** of the drum **12** is provided with a notch **43** that is positioned to receive an end **44** of a lever **45**, as shown in Figures 6 and 9 to prevent free rotation of the drums to permit fouling of the cables should slack develop therein.

The lever **45** is pivotally mounted with a pin **46** in a bearing **47** and the end opposite to the end in engagement with the flange **30** or extended into the notch **43** is provided with an arm **48** that extends for engagement with the cable **15**, as shown in Figure 2 whereby with tension on the cable **15**, such as that resulting from the weight of a bucket suspended by the cable the latch will be retained in the position shown in Figure 3, whereas should slack develop in the cable the arm **48** would drop with the weight of the arm moving the end **44** upwardly into engagement with the notch **43**, as shown in Figure 6. By this means the latch is inoperative or retained in a position out of engagement with the flange **30** as long as there is tension in the cable **15**, however, upon the bucket striking an obstruction, whereby with continued rotation of the shaft **10** slack develops in the cable, the latch is instantly released and the end **44** moves upwardly into the notch **43**.

The bucket opening and closing cable **13** extends from the drum **12** through an end wall **48** of the cab **19** and upwardly through the boom **22** to a sheave **49** which is mounted on a pin **50** and from the sheave **49** the cable **13** passes downwardly through an eye **51** on the side of the block **16** and around the sheave **42** from which it is returned to an eye **52** extended downwardly from the block **16**.

The cable **15** which extends from the drum **14** also extends upwardly through the boom **22** and at the upper end of the boom, the cable **15** is trained over a sheave **53** on a pin **54**. From the sheave the cable passes downwardly to an eye **55** on the upper end of block **16**.

The sheave **42** is journaled by a pin **56** in bearings **57** and **58** which extend upwardly from a head **59** on the lower part of which the jaws **17** and **18** of the bucket are pivotally mounted with pins **60** and **61**. The outer ends of the jaws **17** and **18** are connected by rods **62** and **63** to the block **16** whereby, with the outer ends of the jaws fixedly mounted in relation to the block **16** the inner edges are drawn together as the head **59** is drawn upwardly by the cable **13**.

The cable **23** by which the boom **22** is raised and lowered is secured, at one end, to an eye **64** in the cabin **19** and from the eye the cable extends upwardly through an opening **65** from which the cable extends around a sheave **66** in a pulley block **67** that is secured to the upper end of the boom with a cable **68** and a fastener **69**, and from the sheave **66** the cable **23** extends over a pulley **70** to the shaft **20** on which the crank **21** is provided. In the free position, the shaft **20** is urged by a spring **71**, which acts against a set collar **72**, toward the opposite side of the cab where a toothed wheel **73** secured

to the shaft with a set screw **74** in a hub **75** thereof, meshes with an angle bar **76** on a side wall **77** of the cab.

With the parts assembled in this manner the shaft **20** is pressed inwardly by the crank **21** when it is desired to actuate the boom whereby the shaft is adapted to be rotated to wind the cable **23** thereon or to release the cable therefrom, to adjust the position of the boom, and when the boom is in the desired position the crank is released whereby the spring **71** moves the toothed wheel **73** into engagement with the angle bar **76** so that the shaft is retained in a stationary position.

The boom **22** is pivotally mounted on the platform **78** of the cab **19** with a shaft **79** which is journaled in bearings **80**. The platform and cab are rotatably mounted on the frame or chassis **81** of the hoist with a king pin **82** that extends through a bearing **83** on the platform **78** and through the upper end of the frame **81** with the lower end being secured with a lock nut **84** and a washer **85**. The upper end of the pin **82** is secured in a bearing **86** and a spacing washer **87** is provided between the cab and frame. The frame or chassis **81** is mounted on wheels **88** with shafts **89** in depending bearings or hangers **90**.

It will be understood that the hoist may be mounted on a platform or floor of a truck, tractor, or other suitable device.

It will be understood that other modifications, within the scope of the appended claim, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

In a toy clam-shell bucket hoist, the combination which comprises a chassis mounted on wheels, a platform having a cab thereon rotatably mounted on the chassis, a boom pivotally mounted on the platform, means for raising and lowering the extended end of the boom, a shaft journaled in the cab and having a crank extended from one end, an opening and closing drum fixedly mounted on said shaft, a hoisting drum freely mounted on said shaft, a spring finger mounted in the cab and positioned to frictionally hold the freely mounted drum, the inner ends of said drums being positioned in spaced relation and each of said drums having a lug extended therefrom with the lug of one drum positioned to engage the lug of the other drum, said lugs being positioned whereby upon completion of one revolution of the bucket opening and closing drum the lug thereof picks up the lug of the hoisting drum to actuate the hoisting drum, a bucket having pivotally connected jaws depending from the extended end of the boom, a cable extended from the hoisting drum through the boom to the bucket, another cable also attached to the bucket and trained over a sheave pivotally connected to the jaws of the bucket for opening and closing the jaws and said cable passing from the sheave through the boom to the opening and closing drum fixedly mounted on the shaft in the cab, said opening and closing drum having flanges on the ends on one of which the lug thereof is positioned and one of said flanges having a notch therein, and a latch pivotally mounted in the cab and positioned with one end adapted to engage the notch in the flange of the opening and closing drum and the opposite end positioned to be engaged by the cable of the hoisting drum whereby with the cable of the hoisting drum taut the latch is retained out of engagement with the notch and with the cable slack the latch is moved into the notch to prevent rotation of the drums.

No references cited.