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L. STROHACKER  
GRAB BUCKET CRANE TOY

Filed April 25, 1924

2 Sheets-Sheet 1

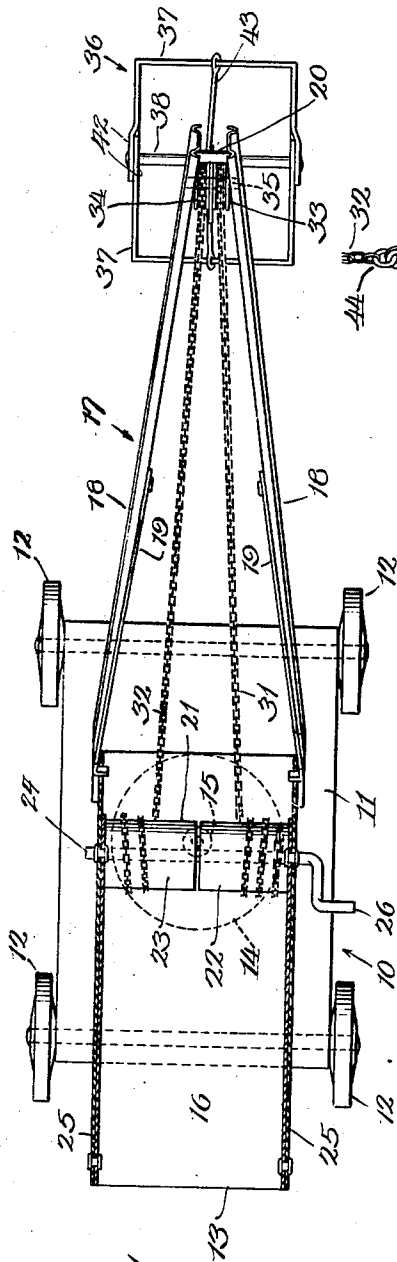


Fig. 1

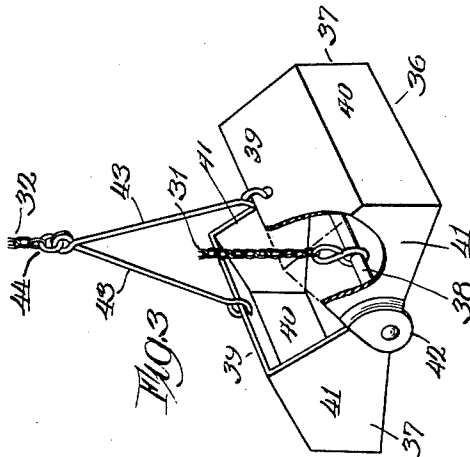


Fig. 2

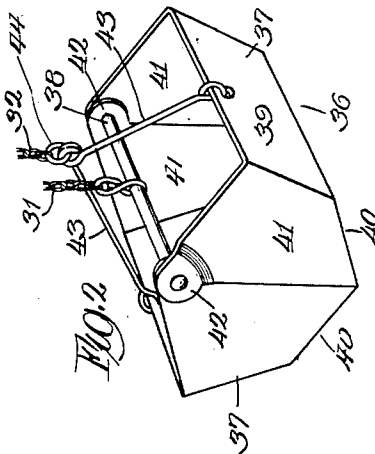


Fig. 3

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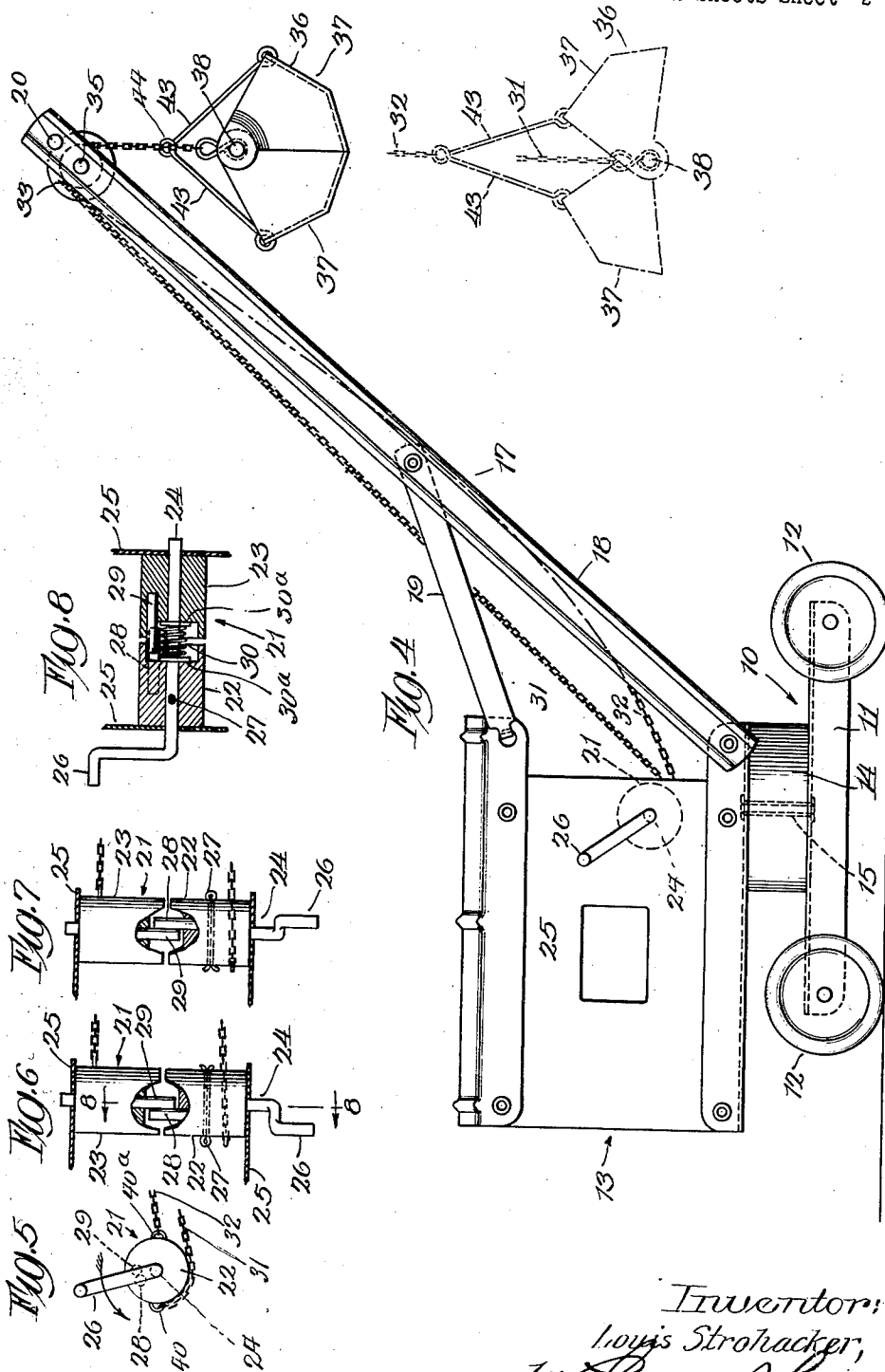
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2 Sheets-Sheet 2



Inventor:  
Louis Strohacker,  
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## UNITED STATES PATENT OFFICE.

LOUIS STROHACKER, OF FREEPORT, ILLINOIS, ASSIGNOR TO STRUCTO MANUFACTURING COMPANY, OF FREEPORT, ILLINOIS, A CORPORATION OF ILLINOIS.

## GRAB-BUCKET-CRANE TOY.

Application filed April 25, 1924. Serial No. 709,046.

*To all whom it may concern:*

Be it known that I, LOUIS STROHACKER, a citizen of the United States, and a resident of Freeport, Stephenson County, and State of Illinois, have invented certain new and useful Improvements in Grab-Bucket-Crane Toys, of which the following is declared to be a full, clear, and exact description.

This invention relates to grab bucket crane toys and its principal object is to provide a novel and useful toy which shall be interesting, enjoyable and instructive to children and others. Another object is to provide a toy, simulating a grab bucket crane, which is of simple, substantial and durable construction, and one that can be easily manipulated by a child. Another object is to provide a grab bucket crane toy having hoisting mechanism for the bucket and automatic means for dumping the bucket and for closing it, controlled by a single crank. Another object is to provide a toy having a grab bucket and having hoisting mechanism arranged to permit the person manipulating the toy, to open and close the bucket at any point at which it is supported. To such ends this invention consists in a toy having a grab bucket, raising and lowering mechanism for opening and closing the bucket. It further consists in a device having a grab bucket, and hoisting mechanism therefor, including a windlass operated from and by a single crank and having novel means for automatically opening and closing the bucket. It further consists in a device having a grab bucket, flexible connections for raising and lowering it, drums over which the flexible connections are trained and a lost motion connection between said drums, whereby they may be rotated in unison or individually, through a limited extent, said flexible connections being connected to the grab bucket in such manner that when supported by one flexible connection the bucket is held closed and when supported by the other flexible connection it is held open. The invention further consists in the several novel features hereinafter fully set forth and is pointed out in the claims.

The invention is clearly illustrated in the drawings accompanying this application, in which:—

Fig. 1 is a plan partly in section of a grab bucket crane toy embodying a simple form of the present invention; Fig. 2 is a perspec-

tive view of the grab bucket showing it in its closed position; Fig. 3 is a perspective view, partly broken away, of the grab bucket in its open or dumping position; Fig. 4 is a side elevation of the toy; Fig. 5 is a side elevation of the windlass employed for raising and lowering the bucket; Fig. 6 is a plan of the windlass partly broken away; Fig. 7 is a view similar to Fig. 6 but showing the parts in a different position and Fig. 8 is a vertical cross section taken on the line 8—8 of Fig. 6.

Referring to said drawings, which illustrate a simple embodiment of the present invention, the reference character 10 designates the running gear of the structure which, in its simplest form, may comprise a platform 11 mounted upon wheels 12. Above the running gear is a superstructure, which as shown, comprises a cabin or other housing or enclosure 13, swiveled upon the running gear, the swivel connection being shown as comprising a block 14 and a king pin or rivet 15 extending through said block and through the floor 16 of the cabin and the floor of the platform 11. The swivel connection provides means whereby the superstructure may be turned horizontally to stand at any angle with respect to the running gear. Secured to the front end of the cabin or housing 13 is a crane 17 which may comprise two crane arms 18 secured to the lower portion of the cabin, and two braces 19 which connect the upper end of the cabin with the arms 17 intermediate their ends. The upper end of the crane arms are spaced apart and secured together by a stay bolt 20. Obviously the exact construction of the parts thus far described is immaterial as they may be varied to suit the style or type of structure which they simulate.

Mounted in the cabin or housing 13 is a windlass 21, which as shown comprises two drums 22, 23 that are mounted upon a crank shaft 24 which extends through the side walls 25 of the cabin and is rotatively mounted therein. The crank shaft has a crank 26 at one end by means of which the shaft is rotated. In the form of windlass shown, one drum (22) is fixedly or rigidly secured to the crank shaft 24 as for instance by a cotter pin 27 and the other drum (23) is loosely mounted upon the crank shaft. A clutch like arrangement, having a lost motion connection, is provided between the

two drums, whereby the drum, which is rigidly fastened to the crank shaft, may be rotated relative to the other drum through a limited extent, the purpose of which will appear later on in the course of this specification. In the simple form illustrated, this lost motion clutch connection comprises two interacting clutch pins or studs 28, 29, one secured on each drum and arranged to be brought into engagement with the other when one drum is moved relative to the other. These clutch pins extend toward each other from the adjacent end faces of the drums and overlap, somewhat like the teeth of the ordinary toothed clutch. The drum 23 is frictionally held against rotation relative to the other drum 22, by a coiled compression spring 30 which surrounds the crank shaft 24 and is confined in recesses formed in the adjacent ends of the drums, and said coiled compression spring bears against the end faces of said drums or against interposed collars 30<sup>a</sup>. The spring 30 acts as a brake and presses the drum 23 against the wall 25 of the cabin or housing 13 to thereby hold said drum stationary, but this force is overcome when the crank shaft is turned and the clutch pin 28 of the drum 22 is engaged with the clutch pin 29 of the drum 23. It will be observed that with the construction shown, the drum 22 may rotate through the greater portion of a complete circle before its clutch pin 28 engages with the clutch pin 29 of the drum 23. This permits the crank shafts 24 to be turned to thereby rotate the drum 22 through a limited extent and thereby wind up or unwind a portion of the chain attached thereto, without rotating the other drum 23. When the clutch pins come into contact both drums rotate in unison and both chains move in unison. Said chains are shown at 31, 32 and are trained over pulleys or sheaves 33, 34 journaled on a pin 35 secured to the upper end of the crane arms 18. The chains 31, 32 are connected to the grab bucket 36 and said bucket will now be described.

In the simple form of grab bucket illustrated, it comprises two companion members 37, 37, which for convenience I shall call "jaws" and said jaws are hingedly or pivotally connected together upon a pin or rod 38. Each jaw or section 37 of the bucket is formed with a side wall 39, a bottom wall 40 and end walls 41 and the end walls are formed with perforated ears 42 through which the pin or rod 38 extends. The ends of the rod or pin are headed down outside of the ears, to hold the two jaws of the bucket thereon. The chain 31 is the hoisting chain and is connected to the pin or rod 38, and normally supports the bucket. When supported by the chain 31, the two jaws 37 are held in closed position by

gravity, the meeting edges of the jaws abutting against each other as shown in Fig. 2. Secured to the side wall 39 of each section 37 is a link 43, which may be in the form of a piece of wire having its ends bent to form eyes, one of which engages in a hole in the side wall of the jaw and the other of which is attached to the chain 32 as for instance by a ring 44. Under certain circumstances the jaws are operated by the chain 32, the chain 31 being slacked, and in this case the jaws swing apart under the influence of gravity, inasmuch as the points of suspension for the bucket are then at the places where the links 43 are attached to the jaws.

The chain 32 controls the jaws of the bucket and is used in opening and closing said jaws. Referring to Fig. 2 it will be seen that when the bucket is suspended by the chain 31 the jaws will remain closed under the influence of gravity while there is any slack in the chain 32. The bucket may be raised in this condition by moving the hoisting chain 31 and maintaining a slight amount of slack in the chain 32. If, however, the slack is taken out of chain 32 and the chain 31 is slacked up, the support for the jaws will be transferred to the links 43 and chain 32, and the center of gravity having been changed to a point between the two supports for the jaws, the latter will swing down under the influence of gravity on said outer supports and to the position seen in Fig. 3, thereby opening the jaws.

Referring now to Fig. 3 which shows the bucket in open position, the jaws may be closed by raising the chain 31 through a predetermined distance. The bucket may be lowered in its open position by lowering the chains simultaneously.

The other ends of the chains are secured to the drums by staples 40, 40<sup>a</sup> or otherwise as is desired. In the form of the invention illustrated the chains are secured to the drums at points distant from the clutch pins 28, 29, the chain 31 being secured to the drum 22 at a point approximately ninety degrees to the left from the clutch pins, (see Fig. 5) and the chain 32 being secured to the drum 23 at a point approximately ninety degrees to the right from the clutch pins, so that when the parts are in the position shown in Fig. 5 with the clutch pins contacting and the bucket lowered to the surface upon which the toy is standing, the places of securement of the chains to the drums will be approximately diametrically opposite each other.

In operation and assuming that the bucket is resting upon the surface upon which the toy is standing and referring to Fig. 5, it will be seen that by rotating the crank 26 in the direction of the arrow thereon, the drum 22 will be rotated, whereas the drum 23 will remain stationary until the clutch

pin 28 engages the clutch pin 29. During this partial rotation of the drum 22 the staple 40 will move through an arc of almost three hundred and sixty degrees before the clutch pin 28 engages with the clutch pin 29 and the attached end portion of the chain 31 will then be wound approximately half way around the drum 22. The other end of the chain 31 will therefore lift the pin 38 and the attached ends of the bucket jaws from the position seen in Fig. 3 to that seen in Fig. 2 thereby closing the jaws 37 of the bucket. As soon as the clutch pin 28 engages the clutch pin 29, the continued rotation of the crank 26 in the direction of the arrow thereon in Fig. 5 will cause the two drums to rotate in unison thereby winding up both chains simultaneously and lifting the bucket while in its closed position. After the bucket has been raised to its upper limit of movement the crank 26 may be turned in the opposite direction, namely in a clockwise direction, whereupon the clutch pin 28 will first be moved away from the clutch pin 29 and approximately one turn of the hoisting chain 31 will be paid out before the clutch pin 28 engages the other side of the clutch pin 29. By paying out this amount of the hoisting chain before the other chain is paid out, the supporting pin 38 and ends of the bucket jaws 17 connected therewith, will be lowered from the position seen in Fig. 2 to that seen in Fig. 3 and the bucket will thereby be opened. The continued rotation of the crank in a clockwise direction will lower the open bucket to the surface upon which the toy stands, and if rotation of the crank be continued after the bucket comes to rest upon the surface, the chain 31 commences to wind up on the drum 22 before the chain 32 is wholly unwound from the drum 23, the supporting pin 38 and the ends of the bucket jaws 27 connected therewith, will be raised, and the bucket closed before the slack in the chain 32 is taken up, after which both chains will be wound up on the drums in unison and the bucket will be raised while in its closed position. From this it will be seen that the bucket while in its uppermost position may be opened, lowered to the surface upon which the toy is standing and opened in such position, closed again and raised to the upper limit of its movement by continually turning the crank in one direction. Moreover while at any place between its upper and lower limits of movement, the bucket may be opened or closed by properly manipulating the crank.

From the above it is obvious that the toy can be operated by a child because it requires no other skill than that of merely turning the crank in a clockwise direction and in a contraclockwise direction. There are no parts that are likely to get out of

order from ordinary usage. Ordinary link chains are shown for handling the bucket but it is understood that other flexible connections, as for instance, light cables or ropes, may be substituted therefor.

More or less variation of the exact details of construction is possible without departing from the spirit of this invention; I desire, therefore, not to limit myself to the exact form of the construction shown and described, but intend, in the following claims, to point out all of the invention disclosed herein.

I claim as new, and desire to secure by Letters Patent:

1. A toy comprising, in combination, a bucket having two relatively movable parts, whereby the bucket may be opened and closed, a bucket hoisting chain therefor, and a bucket opening chain therefor, a bucket hoisting drum, a hand crank therefor, a bucket opening drum, a lost motion clutch connection between said drums, and a friction element continuously engaging said bucket opening drum and acting to continuously apply a braking action thereto, said chains being secured to their respective drums at such places thereon, when clutched together, that the bucket opening chain is fully unwound from its drum while the bucket hoisting chain is partly wound thereon, whereby the bucket may be opened, lowered from its raised position, closed and raised, by turning the hand crank continuously in one direction.

2. A toy comprising, in combination, a grab bucket, having two hinged together jaws, a bucket hoisting chain and a jaw-opening chain connected to said bucket, a hoisting drum to which said hoisting chain is secured, a jaw opening drum to which the jaw opening chain is secured, said chains being secured to their respective drums at such places thereon, when clutched together, that the hoisting chain is partly wound on its drum while the jaw opening chain is fully unwound, a hand crank secured to the hoisting drum, a stationary element and a spring, engaging the jaw opening drum and continuously holding it in frictional engagement with said stationary element, said drums, friction element and chains acting, when the hand crank is turned in one direction, with the chains fully wound upon the drums, to open the jaws of the bucket, lower the bucket, close the jaws thereof and raise the bucket.

3. In a grab bucket crane toy, a windlass for operating the grab bucket of the toy, and comprising a crank shaft having a hand crank thereon, a bucket hoisting drum fixedly mounted on said shaft and a bucket opening drum loosely mounted on said shaft, a lost motion clutch connection between said drums, a stationary element against which

said bucket opening drum bears, and a spring confined in a recess in one of said drums and having one end bearing against the bucket opening drum and frictionally holding the same against said stationary element.

4. In a grab bucket crane toy, a windlass for operating the grab bucket of the toy, and comprising a crank shaft having a hand crank thereon, a bucket hoisting drum fixedly mounted on said shaft and a bucket opening drum loosely mounted on said shaft, a lost motion clutch connection between said

drums, a hoisting chain secured to said bucket hoisting drum, a bucket opening chain secured to said bucket opening drum, said chains being secured upon their respective drums at such places thereon, when clutched together, that the hoisting chain is partly wound upon its drum, while the bucket opening chain is wholly unwound from its drum, and friction means for continuously applying a braking action on the bucket opening drum.

Freeport, Ill., April 21st, 1924.

LOUIS STROHACKER.