Sept. 23, 1958 C. E. CRUIKSHANK ET AL 2,853,336

LIFTING DEVICE

Filed Nov. 10, 1955 2 Sheets-Sheet 1

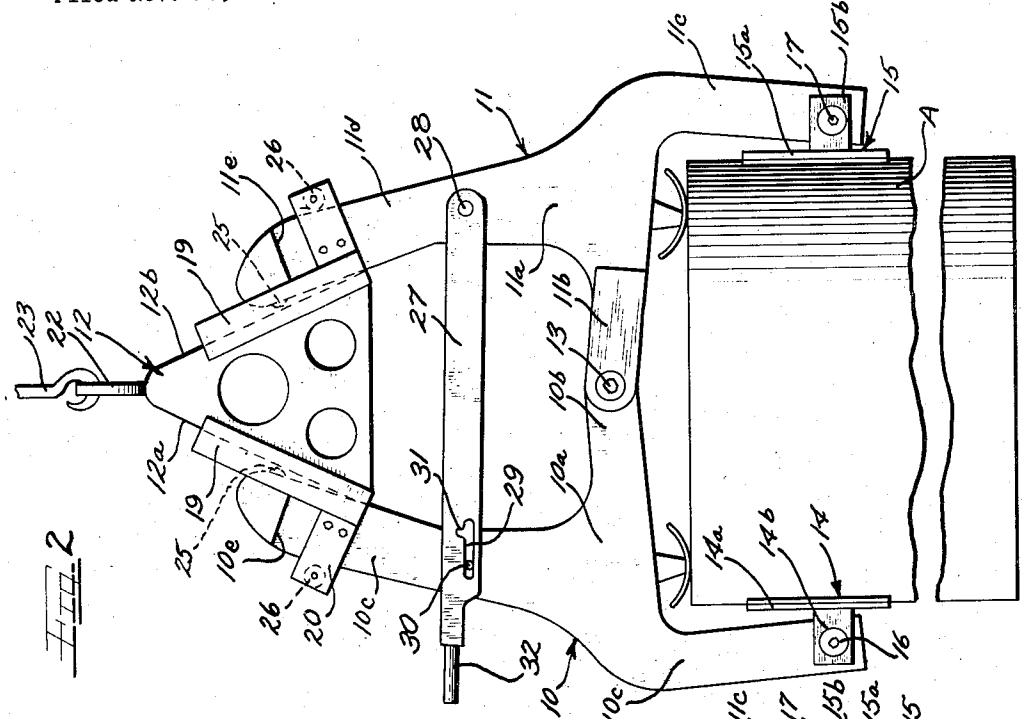


Fig. 2

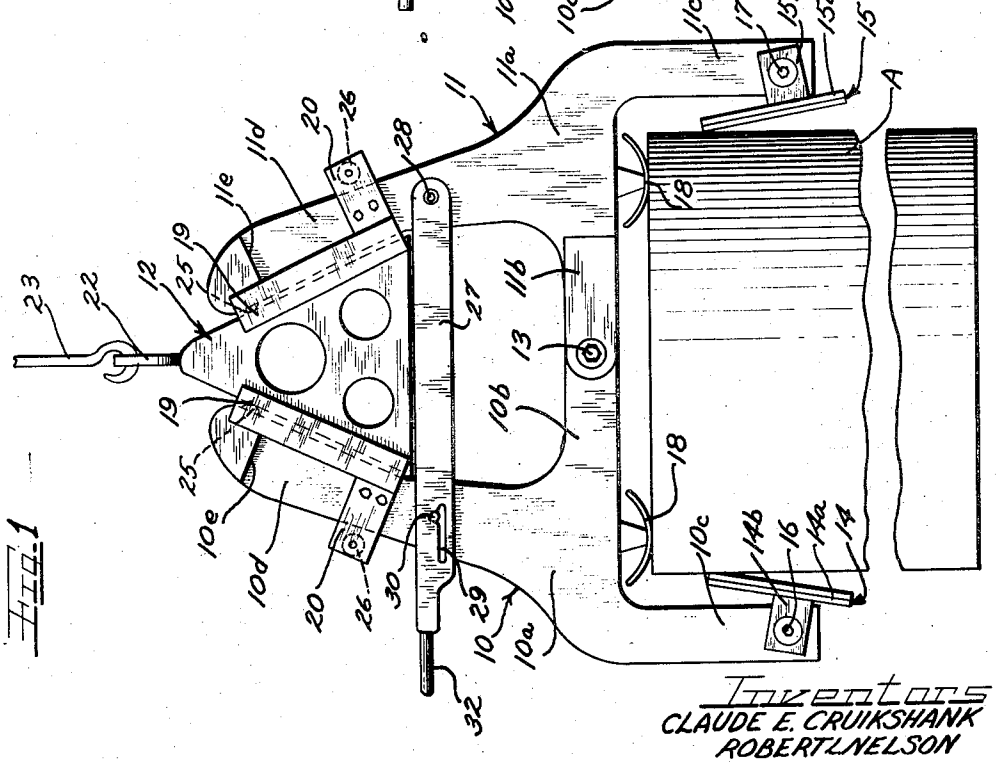


Fig. 1

Inventors
CLAUDE E. CRUIKSHANK
ROBERT L. NELSON

By Hill, Sherman, Meroni, Gross & Simpson Attys

Sept. 23, 1958 C. E. CRUIKSHANK ET AL 2,853,336

LIFTING DEVICE

Filed Nov. 10, 1955 2 Sheets-Sheet 2

Fig. 3

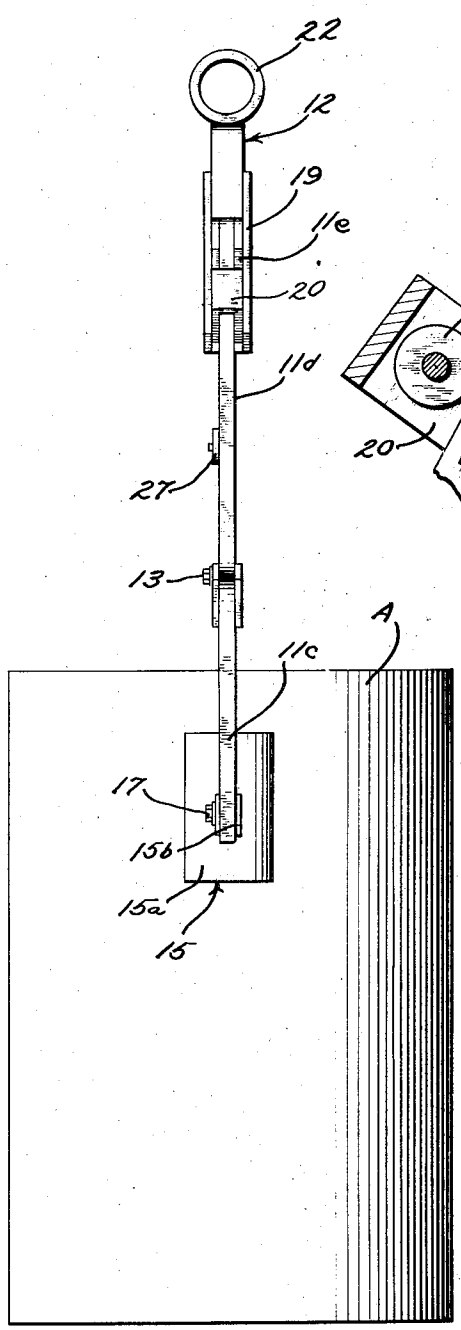


Fig. 5

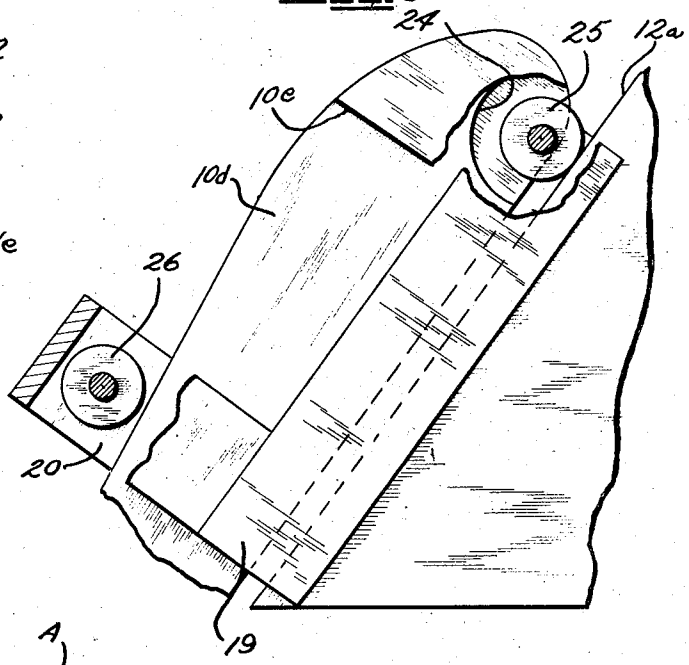
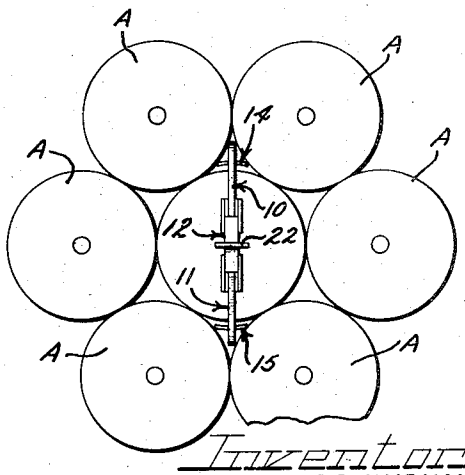


Fig. 4



Inventors
CLAUDE E. CRUIKSHANK
ROBERT L. NELSON

By Hill, Sherman, Meroni, Gross & Simpson Attys

United States Patent Office 2,853,336 Patented Sept. 23, 1958

2,853,336

LIFTING DEVICE

Claude E. Cruikshank, Gary, and Robert L. Nelson, Ogden Dunes, Ind., assignors to Cruikshank Auto Service Company, Gary, Ind., a corporation of Indiana

Application November 10, 1955, Serial No. 546,128

4 Claims. (Cl. 294—115)

This invention relates in general to a lifting device, and more particularly to a device for hoisting and handling cylindrical articles stacked on end and in abutting relationship, although other uses and purposes may be apparent to one skilled in the art.

Specifically, cylindrical articles, such as paper rolls, barrels and the like stacked on end in abutting relationship define diametrically opposed and substantially triangularly shaped gaps around a surrounded cylindrical article. The small gap between the rolls or cylindrical members make it difficult for any heretofore developed lifting device to properly function in removing the articles, especially from the hold of a ship and the like.

The present invention deals with a lifting device having a pair of coacting tongs which are pivotally connected and operated by a wedge-shaped actuator. The jaws of the device are small enough so that they may readily be fitted between the gaps afforded at diametrically opposed sides of a surrounded cylindrical member such as a paper roll. Rollers are provided for engagement with the wedge-shaped actuator to give a free action in operation of the jaws. To hold the jaws in an open position, a locking bar is provided which connects between actuating arms above the pivot point of the jaws.

Accordingly, it is an object of this invention to provide a lifting device which may be employed to hoist and handle cylindrical articles.

Another object of this invention resides in the provision of a lifting device for hoisting and handling cylindrical members that are stacked on end and in closely abutting relationship in the hold of a ship and the like, wherein only small gaps are provided at diametrically opposed points on the cylindrical articles.

Still a further object of this invention resides in the provision of a lifting device for hoisting and handling cylindrical articles stacked on end that is provided with a pair of coacting gripping pads for gripping the articles therebetween wherein the gripping pads are capable of being inserted in small gaps on opposite sides of an article to be lifted.

Still a further object of this invention is to provide a lifting device including a pair of pivotally connected coacting jaw members that are actuated by a wedge-shaped member, wherein additional means are provided to give an extremely free action between the wedge-shaped member and the jaws.

A further feature of this invention is in the provision of a lifting device including a pair of pivotally connected coacting jaws having actuating arms which engage a wedge-shaped member, and wherein means are provided to prevent the wedge-shaped member from being pulled through the space between the arms.

A still further object of this invention is to provide a lifting device including a pair of pivotally connected coacting jaw members, and means for selectively locking the jaws in open position.

Another object of this invention is to provide a lifting device for use in hoisting and handling cylindrical articles

which may be economically constructed by a minimum of parts, and is highly efficient and easy operating.

Other objects, features and advantages of the invention will be apparent from the following detailed disclosures, taken in conjunction with the accompanying sheets of drawings, wherein like reference numerals refer to like parts, in which:

On the drawings:

Figure 1 is a side elevational view of a lifting device according to the invention, wherein the jaws are in open position and associated with a cylindrical member;

Figure 2 is a view similar to Figure 1, but illustrating the parts of the invention positioned wherein the jaws are in closed position around a cylindrical article;

Figure 3 is an end elevational view of the invention in association with a cylindrical article, showing the parts in working position;

Figure 4 is a top plan view, illustrating the manner in which the present invention may be employed to hoist and handle a cylindrical article completely surrounded by other cylindrical articles, wherein only small gaps are permitted for working room; and

Figure 5 is an enlarged fragmentary view, with parts broken away to show underlying parts, of a detailed portion of the invention illustrating the coaction of the wedge-shaped member with an actuating arm.

As shown on the drawings:

Referring generally to Figures 1 and 2, a lifting device is illustrated as constructed in accordance with the principles of the invention, for lifting the cylindrical article designated at A, which comprises in general a pair of substantially identically formed members or tongs **10** and **11**, and a wedge-shaped actuator **12** for operating the tongs.

Each tong is provided with an intermediate body portion **10***a* and **11***a* from which bars **10***b* and **11***b* extend inwardly and are pivotally connected at their free ends by a pin **13**. In the instant case, the bar **11***b* is preferably bifurcated at its free end to receive the bar **10***b*. Thus, the tongs **10** and **11** are pivotally connected by the pin **13**.

Extending downwardly from the outer ends of the tong body portions **10***a* and **11***a* are the vertical jaw portions **10***c* and **11***c* which coact to define the gripping end of the lifting device. Oppositely facing gripping pads **14** and **15** are pivotally carried at the lower ends of the jaw portions **10***c* and **11***c*, respectively. As seen most clearly in Figures 1 to 4, each gripping pad includes respectively an arcuately formed plate **14***a* and **15***a* suitably attached to a U-shaped bracket **14***b* and **15***b* on the convex side of each plate. A nut and bolt assembly extends through the legs of each U-shaped member and through a suitable aperture formed in the respective jaws to define a pivoted pin for the gripping pad as indicated at **16** and **17**, respectively. Thus, the gripping pads **14** and **15** are free to pivot, within limits, when engaging diametrically opposite sides of a cylindrical member to assure full face engagement of the gripping pads with the article as shown in Figure 2. This also permits various size articles, within limits, to be effectively handled by this hoisting device.

To prevent the sharp edges of the tong body portion **10***a* and **11***a* from engaging the cylindrical article to be handled such as indicated at A, and to properly align the lifting device with respect to the article A, a pair of curvature plates **18**, **18** are suitably secured to the lower edge of the tong body portions **10***a* and **11***a* and spaced inwardly from the respective jaw portions **10***c* and **11***c*. The plates **18**, **18** contact the article to be handled as shown in Fig. 1.

To control the movement of the jaw portions **10***c* and **11***c*, an actuating arm portion extends upwardly from

each tong body portion **10***a* and **11***a*, as indicated at **10***d* and **11***d*. The actuating arm portions are disposed slightly at an incline toward each other and define therebetween at the area near their upper ends a substantially cone shaped space. The actuating arms have a broad intermediate portion and terminate in a rounded end. The ends are built-up to increase the thickness of the arm and provide a transversely extending shoulder stop or abutment stop **10***e* and **11***e* on each side of the arm, the purpose of which will be hereinafter more fully explained.

For opening and closing the jaws **10***c* and **11***c* of the lifting device, the wedge-shaped member **12** is disposed in the conical shaped space defined by the opposing actuating arms **10***d* and **11***d* to engage said arms. A pair of guideways or tracks **19**, **19** are carried on the opposite upper edges of the wedge-shaped actuator **12** which define a channel for receiving the inner marginal end edge portions of the arms **10***d* and **11***d*. Actually, the bottom of the guideway channels are defined by the lateral edges of the wedge-shaped actuator **12**, while the sides of the channel are defined by a pair of outwardly extending plates connected to the opposite sides of the wedge-shaped member and along the edge thereof. A pair of wrap-around guide members **20**, **20** are carried by the actuator **12**, one being connected to the lower end of each guideway **19**. The members **20** further serve to coact with the respective stops **10***e* and **11***e* to prevent the actuator **12** from pulling through the space between the arms **10***d* and **11***d* at such a time when nothing is positioned between the jaws of the lifting device.

The wedge-shaped actuator **12** is provided with a plurality of openings to lighten the weight thereof and a hoisting loop or eyelet **22** connected at the upper end thereof. The loop **22** may be easily attached to a hook member or the like such as indicated by the numeral **23** of a crane or other hoisting apparatus.

To permit ease of movement between the actuator **12** and the actuating arms **10***d* and **11***d*, the outer ends of the actuating arms **10***d* and **11***d* are slotted at **24** to receive a rotatably mounted roller **25**, as seen most clearly in Figure 5. The roller **25** rides against the opposite upper edges **12***a* and **12***b* of the wedge-shaped actuator **12**. Thus, no scraping movement is permitted between the actuating arms and the wedge-shaped actuator. When the wedge-shaped actuator **12** is in a raised position relative to the arms of the lifting tongs, as seen in Figure 2, subsequent downward movement thereof would generally cause the outer portion of the wrap-around guides **20** to engage the outer edges of the actuating arms. However, to prevent such scraping between these members, a rotatable roller **26** is carried between the sides of the wrap-around guide to engage the outer edges of the actuating arms **10***d* and **11***d*, as seen most clearly in Figure 5.

To hold the jaws of the tongs in open position when not in use or prior to positioning of the gripping pads around a cylindrical article, a locking bar **27** is provided which is pivotally connected at one end to the actuating arm **11***d* as indicated at **28** and is provided with a longitudinal slot **29** adjacent the other end which slidably engages a pin **30** extending from the actuating arm **10***d*. A transverse locking slot **31** is provided at the end of the slot **29** nearest the pivot point **28** and extends away from the upper edge of the slot **29**. The very end of the arm **27** opposite the pivot end is provided with a handle **32** for controlling the operation of the locking bar. To lock the tongs in open position the pin **30** is seated in the slot **31** as shown in Figure 1.

As seen in Figure 3, the body portions, the jaw portions, and the actuating arm portions of each tong **10** and **11** are integrally formed as a single piece from a flat piece of steel. Even the pivotally connected bars **10***b* and **11***b* are integrally connected with the tongs, with allowances for the bar **11***b* to present a bifurcated end section for the bar **10***b*.

In operation, the lifting device is lowered to position the jaws on diametrically opposite sides of a cylindrical article such as the article A as shown in Figure 1, the plates **18** aligning the device with respect to the article. The tongs are held in open position by the locking bar **27**, and by raising the handle portion **32** of the locking bar **27** to unseat the pin **30** from the groove **31**, the pin is then permitted to slide along the longitudinal slot **29** and allow the tongs to pivot into closed position by raising of the wedge-shaped actuator **12** until a cylindrical article is tightly gripped between the gripping pads **14** and **15** as shown in Figure 2. Ease of movement between the wedge-shaped actuator **12** and the actuating arms **10***d* and **11***d* is made possible by the roller **25** carried by the ends of the actuating arms.

Attention is called to the fact that the lifting device upon being placed upon a cylindrical object, such as a paper roll, must be manually released by the trip lever, thereby preventing accidentally hoisting said roll until fully secured by said lifting device.

When the article A has been moved to a desirable position, lowering of the wedge-shaped actuator **12** causes the rollers **26** carried by the wrap-around guides **20** to engage the outer edges of the actuating arms **10***d* and **11***d* and force the arms inwardly thereby causing the jaws to swing outwardly around the pivot **13** and disengage from the cylindrical article A. As the actuating arms are forced inwardly, the pin **30** will slide along the locking bar slot **29** until reaching the transverse slot **31**. Then the weight of the locking bar will cause it to pivot around pivot point **28** and automatically lock the tongs of the lifting device in open position. Thus, upon depositing the load fully upon a floor or place of movement, the jaws automatically open, and lock in the open and released position, thereby permitting the craneman to remove the lifting device automatically without any human aid, and the jaws remain in open position to accept another cylindrical object.

The force applied by the lifting device is totally lateral pressure upon said roll before it can be lifted vertically. The amount of lateral pressure applied to a cylindrical object, such as a paper roll, is directly proportional to its weight. Change in direction from horizontal to vertical in the movement of roll—has no effect upon the grip, such as the "Ice Tong Type" now in use, making it impossible to lose the roll in the process of transferring it from one point to another.

From the foregoing, it is seen that an efficient lifting device of simple construction and having a minimum of parts is provided which may be easily operated and employed for hoisting and handling cylindrical articles stacked on end, although the device may also be used for various shaped articles.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the instant invention, but it is understood that this application is to be limited only by the scope of the appended claims.

We claim as our invention:

1. A lifting device comprising, in combination: a pair of members pivotally connected to each other, each member having a gripping portion at one end and an actuating portion at the other end, said actuating portions having inner confronting edges with the distal ends thereof inclined toward each other; rollers carried at said distal ends and projecting radially therefrom; a substantially flat wedge-shaped actuator slidably disposed between said edges and engageable with said rollers; a guide carried by said wedge-shaped actuator, said guide having a pair of outwardly and oppositely opening channels each receiving one of said actuating portions of one of said pair of members; a stop carried at the lower end of each of said channels; and an abutment carried by

each of said actuating portions in spaced relation to said rollers, said abutment coacting with said stop to prevent the actuator from at any time disengaging from said members.

2. A device for lifting an article comprising, in combination: a pair of tongs joined to each other by a pivotal connection, said tongs being adapted at one end for liftingly engaging the article; a pair of actuating arms rigidly joined to and extending above said tongs; means operative on said pair of arms to control the displacement of said tongs; and a pair of downwardly facing plates carried by said tongs intermediate said pivotal connection and said one end thereof for supporting and aligning said device on the article for the subsequent lifting engagement thereof.

3. A device for lifting a cylindrical roll of paper comprising, in combination: a pair of tongs joined to each other by a pivotal connection, said tongs having arcuate pivotable gripping pads at one end for liftingly engaging the roll without damage thereto; a pair of actuating arms rigidly joined to and extending above said tongs and having inner confronting edges, the distal ends of said edges being inclined toward each other; a substantially flat wedge actuator disposed intermediately said edges and engageable with the distal ends of said edges; and a pair of downwardly facing plates carried by said tongs intermediate said pivotal connection and said one end thereof for supporting said device on the roll to preclude damage thereto by the edges of said tongs, and for aligning said device with the paper roll for the subsequent lifting engagement thereof.

4. A lifting device comprising, in combination: a pair of members pivotally connected to each other, each member having a gripping portion at one end and an actuating portion at the other end; said actuating portions having inner confronting edges and outwardly directed edges disposed generally parallel to each other, the distal ends of said portions being inclined toward each other; a first roller carried by each of said distal ends and projecting radially from said inner edge thereof; a substantially flat wedge-shaped actuator slidably disposed between said inner edges and engageable with said first rollers; a guide carried by said wedge-shaped actuator, said guide having a pair of outwardly and oppositely opening channels each receiving one of said actuating portions of one of said pair of members; a second roller carried by each of said stops and engageable with one of said outwardly directed edges for moving said actuating portions together; a stop carried at the lower end of each of said channels; and an abutment carried by each of said actuating portions in spaced relation to said rollers, said abutment coacting with said stop to prevent the actuator from at any time disengaging from said members.

References Cited in the file of this patent

UNITED STATES PATENTS

760,582	Taylor	May 24, 1904
1,213,574	Baash	Jan. 23, 1917
1,466,916	Pearl	Sept. 4, 1923
1,571,332	Herminghausen	Feb. 2, 1926
2,088,519	Hershey	July 27, 1937
2,215,844	Van Syckle	Sept. 24, 1940
2,259,376	Guild	Oct. 14, 1941
2,337,177	Breslau	Dec. 21, 1943
2,364,897	Grigsby	Dec. 12, 1944
2,394,779	Hunter et al.	Feb. 12, 1946