A. CLEMENS.

LOAD HOLDING DEVICE FOR HOISTS AND THE LIKE.

APPLICATION FILED SEPT. 24, 1913.

1,103,038. Patented July 14, 1914.

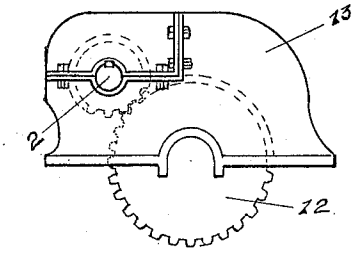


Fig 2

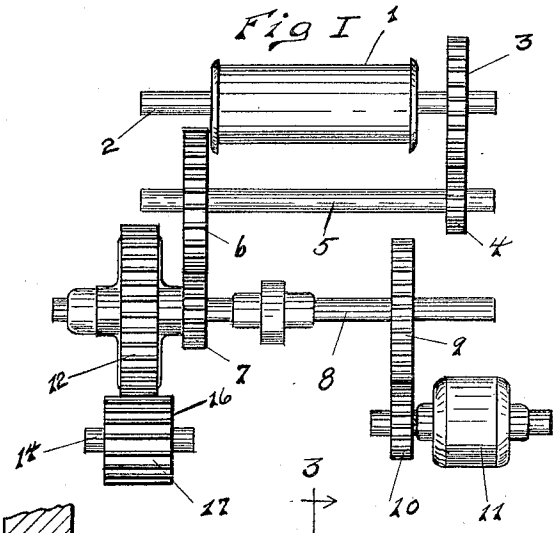


Fig I

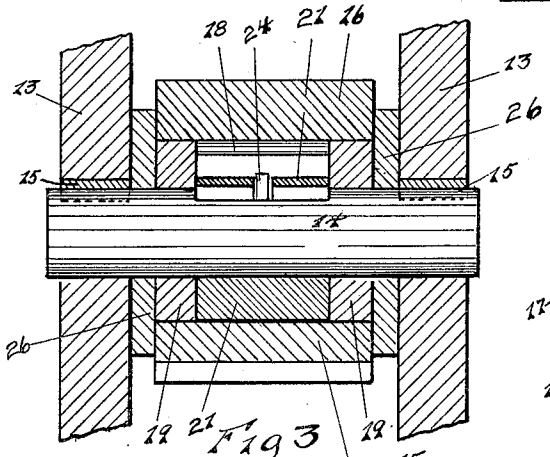


Fig 3

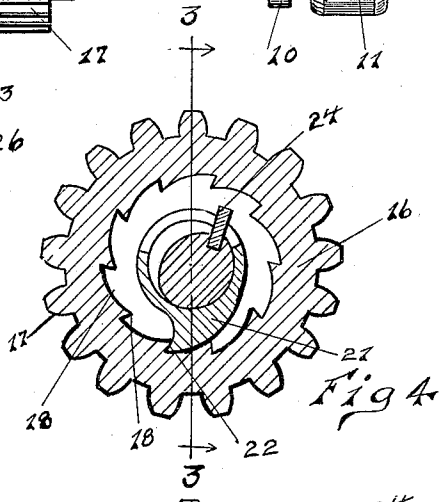


Fig 4

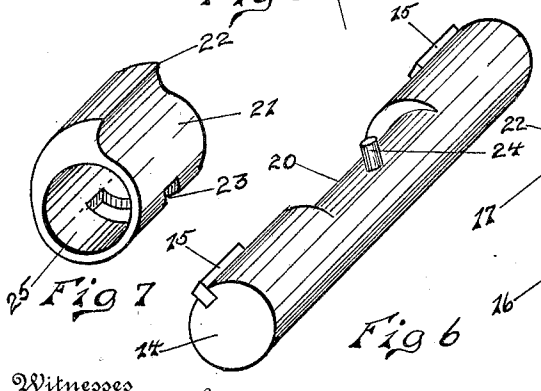


Fig 7

Fig 6

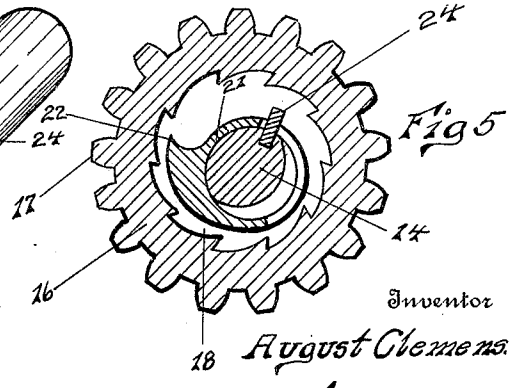


Fig 5

Witnesses

Robert Farcher.

Hazel Owen.

Inventor

August Clemens.

By Bond & Miller

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

AUGUST CLEMENS, OF ALLIANCE, OHIO.

LOAD-HOLDING DEVICE FOR HOISTS AND THE LIKE.

1,103,038. Specification of Letters Patent. Patented July 14, 1914.

Application filed September 24, 1913. Serial No. 791,491.

To all whom it may concern:

Be it known that I, AUGUST CLEMENS, a citizen of the United States, residing at Alliance, in the county of Stark and State of Ohio, have invented a certain new and useful Improvement in a Load-Holding Device for Hoists and the like, of which the following is a specification.

My invention relates to improvements in a load holding device for hoists and the like, in which the load is automatically held in elevation, and the present invention has more specifically to do with hoists used in connection with traveling cranes such as are used in factories where it is desired to elevate heavy objects.

The mechanism pertaining to the traveling crane and the mechanism for hoisting do not have to do with my present invention so far as detailed construction is concerned as such parts are common and well known.

The objects of my invention are, first, to provide an attachment for hoists whether of the traveling crane type or of any other whereby the load lifted is held against downward movement when the lifting power is released. Second, to provide for securely and automatically locking the parts pertaining to my invention against backward movement or reverse movement during the time the lifting power is cut off for any purpose, but more specifically when the motive power is shifted or changed; that is to say shifted from lifting to lowering.

These objects, together with other objects readily apparent to those skilled in the art I attain by the construction illustrated in the accompanying drawing, although my invention may be embodied in a variety of other mechanical forms, the construction illustrated being chosen by way of example.

In the accompanying drawing—Figure 1 is a top plan view showing the winding drum and the usual gear and clutch arrangement properly arranged, said view being diagrammatic. Fig. 2 is a side elevation of the housing designed to hold the fixed bar or shaft upon which the locking or holding wheel is mounted. Fig. 3 is a vertical section taken on line 3—3, Fig. 4. Fig. 4 is a transverse section of the fixed shaft or bar and a section of the locking wheel showing the parts in position for locking the wheel against backward or reverse rotation. Fig. 5 is a similar view showing the locking wheel in released position. Fig. 6 is a detached perspective view of the fixed shaft or bar. Fig. 7 is a detached perspective view of the wheel locking dog.

Similar numerals of reference indicate corresponding parts in all the figures of the drawing.

In the accompanying drawing, 1 represents the winding drum, whch drum is of the usual construction, said drum being mounted upon the shaft 2 upon which shaft is securely fixed the gear wheel 3, which gear wheel meshes with the pinion 4 mounted upon the shaft 5 and upon which shaft is mounted the gear wheel 6, which gear wheel meshes with the gear wheel 7 mounted upon the shaft 8 upon which shaft is mounted the gear wheel 9, which gear wheel meshes with the pinion 10, said pinion being mounted upon the motor shaft 11. Upon the shaft 8 is mounted the ordinary and common clutch wheel 12. These parts just above described are all common and well known and are connected to a crane in the usual manner, the parts being shown in a conventional way to illustrate my invention as applied to these old parts. To the casing 13 is securely attached the shaft or bar 14, said shaft or bar being held against rotation by means of the keys 15 or their equivalents, but in a manner that when the dead down pull of the load is upon the locking wheel 16, said shaft or bar cannot rotate. The hollow wheel 16 is provided with the ratchet teeth 18, said ratchet teeth being formed upon the inner surface of said wheel. To the ends of the wheel 16 are connected in any convenient and well known manner the disks 19, which disks are loosely mounted upon the shaft 14 and are so located and arranged that the wheel 16 and the disks 19 will be concentric with the parts of the shaft 14 upon which said disks 19 are mounted. The shaft 14 is provided with the eccentric portion 20, which eccentric portion is formed of a length to correspond substantially with the distance between the inner faces of the disks 19. Upon the eccentric portion 20 of the shaft 14 is mounted the detent or locking dog 21, which detent or locking dog is substantially of the form shown in Fig. 7.

The detent or locking dog 21 is provided with the lip 22, which lip is so shaped that it will engage one of the ratchet teeth 18 as best illustrated in Fig. 4 when the wheel 16 rotates in the opposite direction from the direction it must rotate in while the load is being elevated. The detent or locking dog

21 is formed of such a shape and size that when the wheel 16 is rotating in the direction to lift or elevate the load the ratchet teeth will pass the lip 22 by reason of the fact that said detent or locking dog will be rotated in the same direction for a short distance or until it assumes the position as best illustrated in Fig. 5 or substantially the position shown in said figure; or in other words the teeth will move under the detent or locking dog as the wheel 16 rotates; but when the wheel 16 rotates in the opposite direction the rear face of a given ratchet tooth 18 will carry the detent or locking dog in a backward direction and bring the detent or locking dog 21 into position to lock the wheel 16, at which time the wheel 16 will be locked against rotation upon the shaft 14, thereby locking the winding drum 1 against rotation during the time the load is not controlled by the motor 11, the clutch wheel 12 being provided with the usual clutch which is controlled in the usual manner, but is locked against rotation by reason of the meshing of the wheel 16 with the wheel 12.

For the purpose of limiting the movement of the detent or locking dog 21 said locking dog is provided with the elongated slot 23, through which elongated slot the pin 24 is passed, which pin is securely connected to the eccentric portion 20 of the shaft 14. The elongated slot 23 is formed of such a length that the detent 21 is free to rock or oscillate a sufficient distance to properly clear the ratchet teeth 18 when said wheel is rotated in the direction to lift the load and also to be brought into the position illustrated in Fig. 4, whereby the lip of the detent 22 is engaged with the proper tooth and the detent forced up against that portion of the shaft 14 which is concentric with the ends of the shaft or bar 14, said shaft or bar also being concentric with the wheel 16, by which arrangement the entire down pull of the load is placed upon a single tooth, but by reason of the wedge action the force is distributed or partly thrown upon the bar 14 by reason of the fact that the portion of said bar upon which the detent or locking dog is located is eccentric to those portions of the shaft or bar upon which the wheel 16 is mounted. In order to provide for this wedge action, and that the detent may be lifted bodily the opening 25 is formed of a size greater than the size of the eccentric portion of the shaft and of a size sufficient to allow the detent to be slid past either end or at least one end of the shaft or bar 14, the proper key 15 being first removed if found necessary.

For the purpose of holding the wheel 16 in the proper relative position with reference to the shaft or bar 14 or in other words for preventing any sliding movement of said wheel upon the shaft or bar 14, the washers such as 26 should be provided, said washers being of such a thickness that they will prevent any lateral movement of the wheel 16 but at the same time allow said wheel to freely rotate when not in a locked position upon the shaft upon which it is mounted.

In the drawings the ratchet teeth 18 are shown spaced apart a considerable distance but in some instances it may be desirable to locate the teeth quite close together so that a very slight backward movement of the locking wheel will engage a tooth. The number of teeth and their relationship with reference to each other will depend somewhat upon the character of the hoist and the work the hoist is to do. In elevating very heavy loads as for instance one of many tons very little downward movement or drop of the load should be permitted otherwise a very sudden and heavy strain or shock will be thrown upon the locking wheel.

It will be understood that when the locking wheel stops rotating the locking dog or detent 21 when in the position illustrated in Fig. 5 will drop by gravity so as to bring the lip 22 directly back of a given tooth and as the detent travels with the backward movement the locking wheel will be gradually and not suddenly stopped, by which arrangement the load is checked in its downward movement in such a manner that no jerk is imparted to or upon the elevating cable and consequently no heavy or sudden thrust pertaining to the mechanism of the crane or elevating device.

I have illustrated the teeth 16 and the lip 22 as having sharp angled corners, but the exact angularity is immaterial.

Having fully described my invention what I claim as new and desire to secure by Letters Patent, is—

In a device of the character described, a casing having connected thereto a non-rotatable bar, said bar provided intermediate its ends with an eccentric portion, a locking dog mounted upon the eccentric portion of the fixed shaft, said locking dog provided with an elongated slot, a pin carried by the fixed shaft adapted to limit the movement of the locking dog, said locking dog provided with a lip, a locking wheel provided with internal teeth and the lip of the locking dog adapted for engagement with said internal teeth.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

AUGUST CLEMENS.

Witnesses:
ROBT. T. MEYER,
F. W. BOND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."