

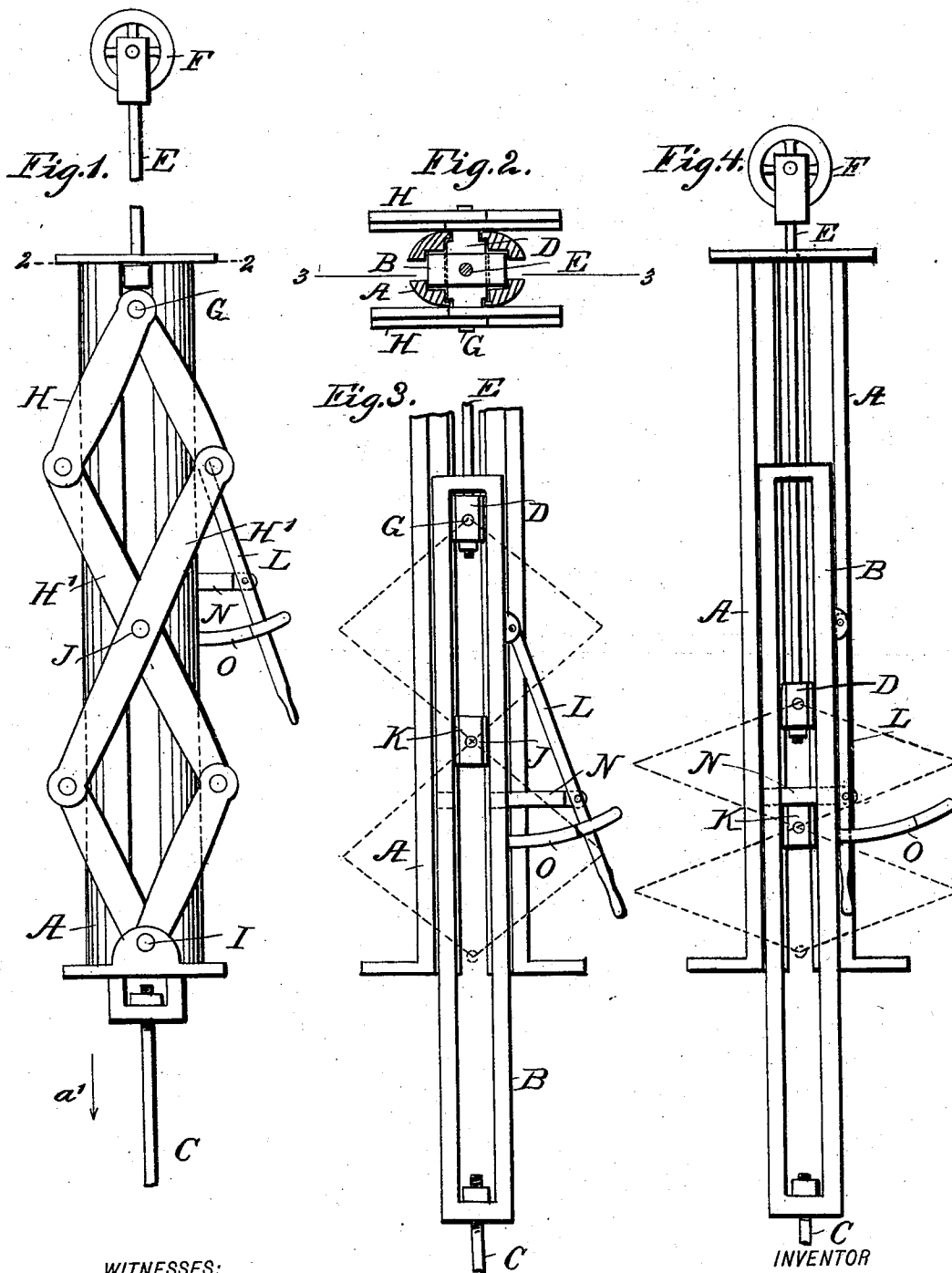
(No Model.)

H. R. KOCH.

VARIABLE LIFTING DEVICE FOR ELEVATORS.

No. 501,840.

Patented July 18, 1893.



WITNESSES:

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VARIABLE-LIFTING DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 501,840, dated July 18, 1893.

Application filed December 13, 1892. Serial No. 454,978. (No model.)

To all whom it may concern:

Be it known that I, HENRY RUSH KOCH, of St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and Improved Variable-Lifting Device for Elevators, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved variable lifting device for hydraulic elevators, which is simple and durable in construction, economic in use of water, and which can be arranged to carry the full load to any given point, and then automatically change for a light lift.

The invention consists of a lazy tongs pivoted at one end to a fixed support or casing and pivotally-connected with the lifting rod, and adapted to be engaged at one of its pivots by the piston beam or slide.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a sectional plan view of the same on the line 2—2 of Fig. 1. Fig. 3 is a sectional side elevation of the same on the line 3—3 of Fig. 2; and Fig. 4 is a similar view of the same in a different position.

The improved variable lifting device is provided with a suitably constructed casing A formed with suitable guideways for a slide B preferably made in the shape of a link, as illustrated in Fig. 3, and connected at one end by a rod C or other connection with the piston rod of the piston in the hydraulic elevator cylinder. In the upper end of the slide B is fitted to slide a block D rigidly connected with the lifting rod E carrying at its upper end the sheave F under which passes the rope carrying the cage in the usual manner.

On the block D are formed transversely-extending pivots G forming part of lazy tongs H, one for each side of the casing A, as plainly shown in the drawings. The lower pivot I of each lazy tongs, is held on the casing A and the pivot J for the middle links H' of the lazy tongs is formed on a block K fitted to slide

in the slide B below the block D, as plainly shown in Fig. 3.

On one side of the slide B is fulcrumed a lever L carrying a bolt N mounted to slide transversely across the opening in the slide B, so as to move in the path of the block K. See Fig. 4. The lever L is held normally in an outermost position, and is supported for this purpose on a suitable arm O projecting from the slide B.

Hydraulic elevators are usually operated by the direct pressure of the water on the piston head, which operates through the piston rod directly on the traveling sheaves, which are geared according as the distance of travel of the cab or car is to the distance of travel of the piston, and is usually fixed and takes the full travel of the piston and consequently a full cylinder of water, to carry the cab its full distance, whether carrying its full capacity or empty.

This device is intended to save the consumption of water by assisting the piston rod to move the traveling sheaves their full distance, when it is desired to carry only a partial load, by the pistons traveling only part of the distance, thereby saving in the consumption of water.

The variable lifting operation is as follows: This device is intended to operate between the piston rod and the traveling sheaves F, and is shown in Fig. 1 as it appears when the car is at its lowest point or point of beginning. As will be seen the bolt N is in its normal position—that is—it is drawn out of the path of the block K, and the pull is exerted by the slide B and the block D on the lifting rod E and sheave F, as is shown in Fig. 3, and the lazy tongs take no part in the pull, and it takes the full travel of the piston and consequent consumption of water, to pull the sheave F the distance of the length of the cylinder; by this it will be seen that the full power of the water pressure is exerted on the sheave F and the machine is in position to carry its full capacity. If the operator desires to lift a light load or run the cab up empty, he presses the lever L inward so as to move the bolt N into the pathway for the blocks D and K; then the pull is immediately exerted on the block K, and the traveling slide B, the block K and the lazy tongs, will pull the block D and sheave

F the full distance by the slide B and piston rod traveling only part of the distance. As shown in Fig. 3, the slide B has traveled part of the distance, pulling on the block D, and in Fig. 4, the slide B has traveled the same distance, but has pulled on the block K, so that the rod E and sheave F have traveled a considerable distance farther, relative to the previous movement described and shown in Fig. 3.

10 The operation for pulling the full load to a given point and then changing automatically to its light lifting capacity is as follows: For this purpose the device must be constructed with two bolts like the bolts N, or the one used must be placed higher up on the slide B, regulated according to the point to which the heavy loads are to be carried; constructed in this way it will readily be seen that when the bolt N is thrown in, it will be at some point between the blocks D and K, and then when the slide B moves in the direction of the arrow *a'* the pull will be exerted directly on the block D (as described in the first part of the variable lifting operation) until the bolt N overtakes the block K, when the pull will be changed automatically to the block K and the lazy tongs, as described in the latter part of the variable lifting operation.

25 It will be seen that any desired number of links may be arranged in the lazy tongs and any desired number of bolts N may be employed along the slide B, according to the height the elevator cage is traveling in the building.

30 This device is designed to permit at will of the changing of the lifting capacity of the elevator and consequent consumption of water, at the starting point, so that it will carry either the full capacity or partial load the entire height of the building, and it is also designed for buildings in which the heavy lifting is confined to the lower floors only, so that

a direct pull is had on the cage during the first part of its ascent, while a light lift is obtained for the balance of the distance which the cage travels.

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

1. In a hydraulic elevator, the combination with the piston rod having slide or head on its upper end and the sheave-carrying lifting rod having a sliding connection at its lower end with the upper end of said slide or head, of a lazy tongs pivoted at its lower end to a fixed support and pivotally connected at its upper end with the lower end of said lifting rod and a device adapted to engage at will the slide or head in its downward movement with the tongs intermediate of the ends thereof to cause the tongs to fold and draw down upon the lifting rod, substantially as set forth.

2. In a hydraulic elevator, the combination with a vertical stationary guide way and a slide or head mounted therein, a piston rod connected at its upper end with the lower end of said slide or head, and a lifting rod having a sliding connection at its lower end with the slide or head, of a lazy tongs pivoted at its lower end to said guide way and pivotally connected at its upper end to the lower end of the lifting rod and provided between said two pivotal points with a block sliding on the said slide or head, a transverse bolt adapted to cross the slide or head and engage said block in the downward movement of said slide or head to fold said tongs and cause the same to exert a downward pull on the lifting rod, and means for operating said bolt, substantially as set forth.

HENRY RUSH KOCH.

Witnesses:

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