

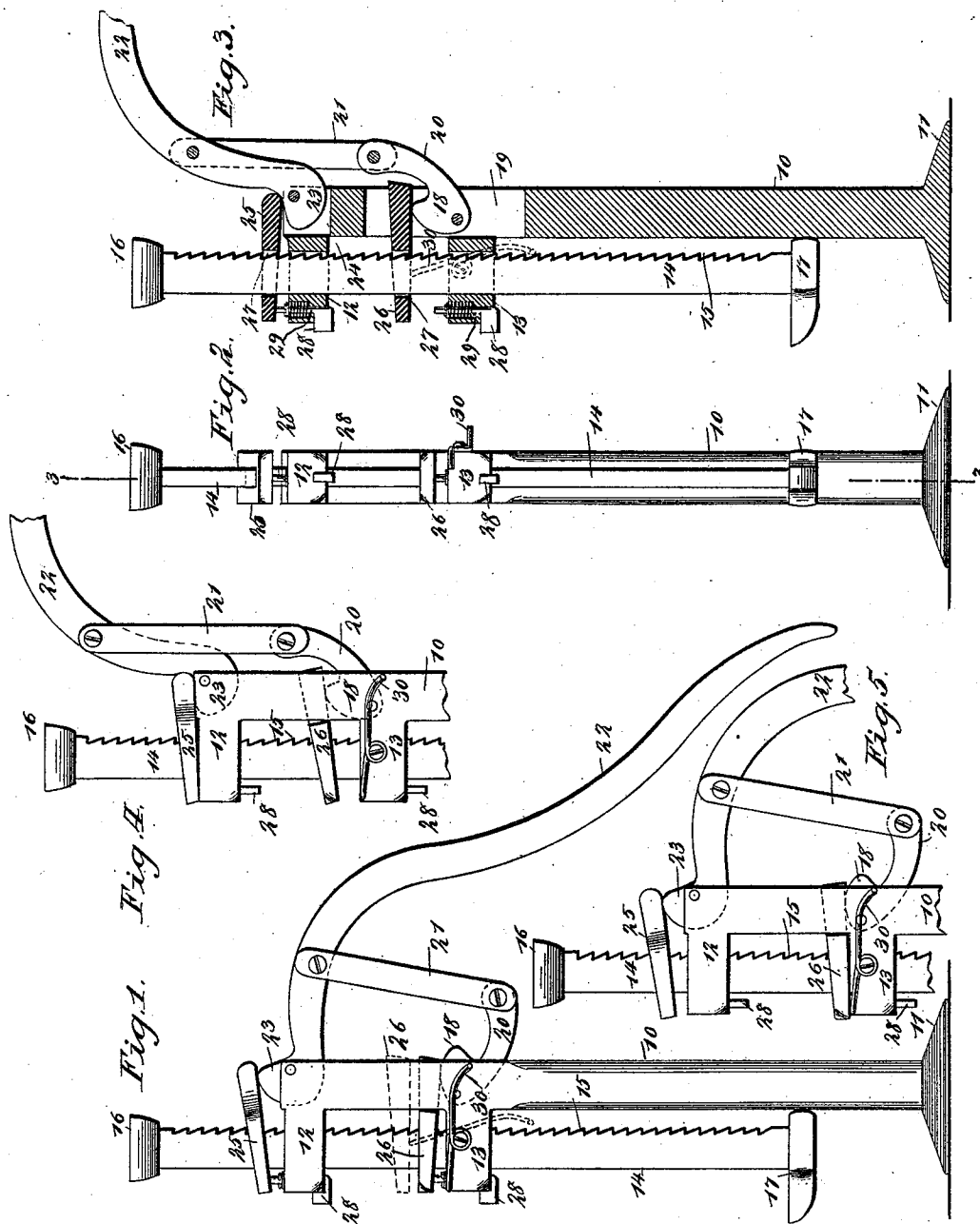
(No Model.)

2 Sheets—Sheet 1.

D. NELSON.
LIFTING MACHINE.

No. 523,440.

Patented July 24, 1894.



WITNESSES:

John A. Rennie
C. Sedgwick

INVENTOR

D. Nelson
BY *Munn & Co.*
ATTORNEYS.

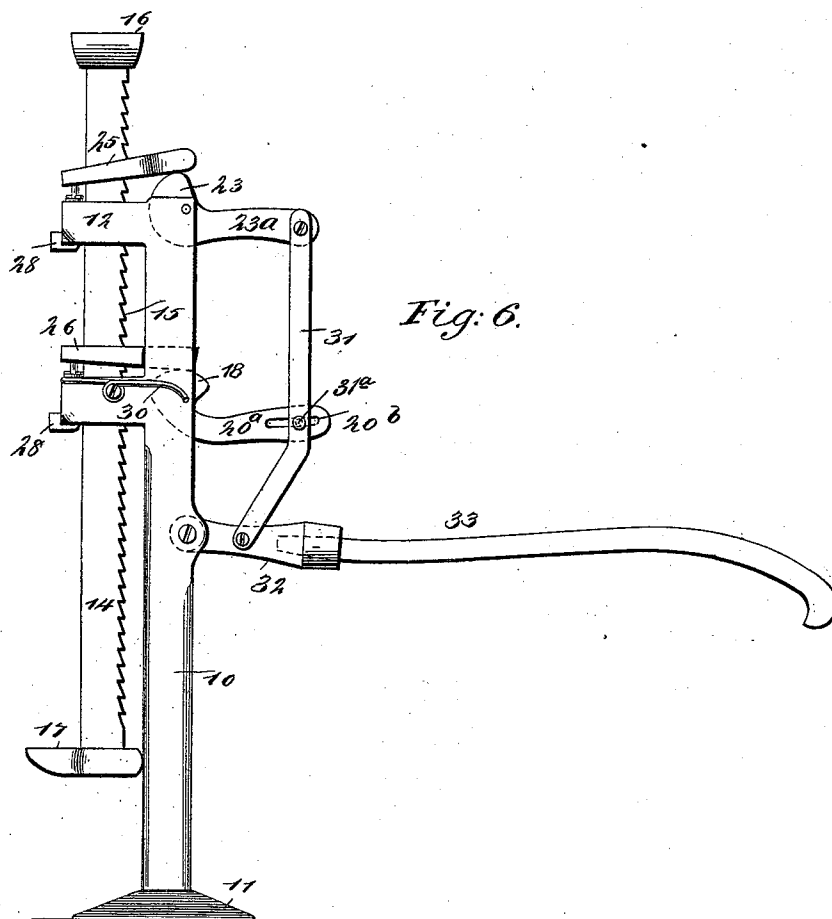
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UNITED STATES PATENT OFFICE.

DAVID NELSON, OF RENO, NEVADA, ASSIGNOR TO THE NELSON AUTOMATIC LIFTING MACHINE COMPANY, OF SAME PLACE.

LIFTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 523,440, dated July 24, 1894.

Application filed June 22, 1893. Serial No. 478,468. (No model.)

To all whom it may concern:

Be it known that I, DAVID NELSON, of Reno, in the county of Washoe and State of Nevada, have invented a new and Improved Lifting-Machine, of which the following is a full, clear, and exact description.

My invention relates to a lifting machine which may be employed as a jack, or which may be otherwise applied.

10 The object of the invention is to provide a machine of great purchasing power, combining simplicity, quickness in operation and change of action with economy of construction.

15 A further object of the invention is to shift a bar or like object in direction of either end through the medium of applied eccentrics and loose dogs, and to provide a means whereby the dogs when gripping an object will engage 20 with it equally upon opposite sides, thereby obviating the one-sided strain to which such objects are subjected when actuated by dogs in the usual manner.

25 The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

35 Figure 1 is a side elevation of the lifting machine employed as a lifting jack. Fig. 2 is a front elevation of the jack. Fig. 3 is a vertical section taken practically on the line 3-3 of Fig. 2; and Figs. 4 and 5 are side elevations illustrating the parts in two positions 40 when the dogs are operated to move the bar upward, Figs. 1, 2 and 3 illustrating the positions of the dogs when the bar is moved downward thereby; and Fig. 6 is a side elevation of the lifting machine or lifting jack, illustrating a slight modification in the mechanism for operating its eccentrics.

45 In carrying out the invention, when the principles of my invention are applied to a lifting jack as shown in the drawings, the frame of the jack comprises a standard 10, fitted with a suitable base 11 and with two 50 arms 12 and 13, spaced at proper intervals apart one below the other, which arms extend

at an angle from the standard, preferably at a right angle, and one of the arms is located at the top portion of the standard. The arms 12 and 13, are slotted to admit of the passage 55 through them of a lifting bar 14, one edge of which bar, preferably its inner edge, is provided with a series of teeth 15, and the teeth are usually made to extend from top to bottom of the lifting bar as shown in Figs. 1 and 60 3. The teeth are given a downward inclination, as is likewise shown in the same figures, and the lifting bar is provided with an enlarged head 16, at its upper end and a foot piece 17 at its lower end, the foot piece being 65 made to extend beyond the front or smooth edge of the lifting bar.

A cam or eccentric 18, is pivotally located within a recess 19 produced in the standard 10 where said standard connects with the 70 lower arm 13. The recess 19 extends some distance beyond the upper edge of the cam or eccentric and likewise some distance below it, as is shown in Fig. 3; and the cam or eccentric 18 is attached to or made integral 75 with a curved shank 20, the curve being preferably in an upwardly direction. The outer end of the shank 20 has pivotally connected with it links 21. The said links 21 are pivotally connected at their opposite or upper ends 80 with a handle 22, the said handle being arched where the links are in connection with it, and the outer end of the handle extends well downward, being curved away from the standard 10, as shown in Fig. 1. The upper end 85 of the handle is made to terminate in a cam or eccentric 23, which is pivotally located within a recess or opening 24 made in the top of the standard; and the two cams or eccentrics 18 and 23, are so located that when one 90 of them is operating to lift an object placed above it the other will operate to lower an object sustaining a like position to it. The cams or eccentrics are usually made semi-heart shaped, but they may be made of any 95 shape that occasion may demand. The contour illustrated is that which is usually adopted.

In connection with each cam or eccentric a dog is employed. The upper dog is located 100 above the upper arm, and is designated as 25; while the lower dog, which is located

above the lower arm 13 of the standard is designated as 26. Each of these dogs is provided with an opening 27 through which the lift bar is passed, and the said bar will pass freely through the openings when the dogs are in a horizontal position or at right angles to the bar. The dogs have a gripping surface at opposite edges of the bar, one wall of the opening 27 in each dog engaging with the toothed surface of the lift bar, while the other will clamp or clasp the opposing edge when the dogs are carried to any other position with relation to the bar than at a right angle. Therefore, the lifting or actuating position of each dog is when it is diagonally located with respect to the bar, and the dogs are operated by working the handle 22 with a pumping action, and the dogs will act automatically, one of them being raised to a diagonal position by one of the cams while the other is restored to a horizontal position by the remaining cam or eccentric and will drop to obtain a grip which will enable it to actuate the bar when its cam exerts upward tension upon it.

A spring-controlled latch 28, is located in the outer end of each arm, the said latch terminating at its lower end in a head; and each arm is provided with a recess 29, which will receive the head of its latch, and when the latch head enters the arm recess the upper end of the latch will extend beyond the upper face of the arm with which it is connected, as shown in Figs. 1, 2 and 3; when, however, the latch head is drawn out of the recess, and is turned to engage with the lower face of the arm with which it is connected, the top of the latch will be drawn downward until it is flush with or below the upper surface of the arm, as shown in Figs. 4 and 5.

A lift lever 30, is pivoted preferably upon one side of the lower arm, and the said lift lever when it is depressed at one end will engage with the lower dog 26, and lift that dog to a horizontal position.

In operation, when the bar 14, is to be gradually moved upward, as for example to lift an object, the latches 28, are locked within the arms with which they are connected; and as shown in Figs. 4 and 5, by moving the handle 22 with an up and down stroke, the lower cam or eccentric, for example, will be forced upward and will carry the lower dog with it in the diagonal position, and therefore the dog will lift the bar 14 upward a given number of notches, while the upper cam or eccentric will have dropped to its lower position and will have permitted the upper dog to drop horizontally downward to an engagement practically with the upper face of the upper arm of the standard, where it will be opposite one of the notches in the bar. Upon the next stroke of the handle the order of things will be reversed, as shown in Fig. 5; the lower dog will be released by its cam and will be permitted to drop to the lower arm of the standard to obtain a fresh hold, while the upper cam or eccentric will be carried to the

lifting or upper position, and will carry the upper dog upward, thereby taking the bar with it. Thus at each movement of the handle, one of the dogs is made to travel upward and the other dog is suffered to drop downward to obtain a fresh hold, which will enable it to carry the bar upward when the upper dog is released.

If it is desired to drop the bar quickly, the handle will be carried in such position that one of the dogs will be horizontally located, for example, the upper dog; and either before or after placing the upper dog in its position the lower dog will be elevated or raised to the horizontal position by operating the lift lever 30. At this time the lift bar 14, will freely drop down through the openings in the dogs.

It is not absolutely necessary to pump up or gradually lift the lift bar to an elevated position, as should occasion demand that it be drawn rapidly upward to engage with an article to be lifted, for example, or to be lowered, the bar may be drawn upward by the hand, as it will freely move in the openings in the dogs.

When it is desired to gradually lower the bar 14, the latches are permitted to extend above the arms, as shown in Figs. 1, 2 and 3; whereupon when weight is exerted upon the upper end of the bar by pumping the handle in the same manner as when a lifting action is to be obtained, the dogs will be automatically raised and lowered; they will be raised but slightly as they will be tripped upward by the spring latches 28 as soon as the dogs are in position to permit said latches to act, as the latches are depressed when the dogs are in an inclined position; and when a latch forces the dog upward it releases it from the teeth of the bar and then the other latch can grip the bar, which will have fallen a predetermined distance, for example a distance equal to one or more teeth. The foot 17 is placed upon the bar in order that an object may be lifted from the lower end of the bar when it cannot be engaged by its upper end. It will be observed that the dogs engage equally with opposite sides of the lift bar, and therefore do not exert what is termed a one-sided strain upon it.

In the modification illustrated in Fig. 6 of the drawings there is no change in the construction of the body of the machine. The extended handle 22, is omitted, and both the upper and lower eccentrics are provided with short rearwardly extending shanks, which shanks, when the eccentrics are in the same position, are substantially parallel. The shank of the upper eccentric is designated as 23^a, while the shank of the lower eccentric is designated by the reference numeral 20^a; and in the latter shank a longitudinal slot 20^b is made near the rear end of the shank.

The shanks of the two eccentrics are connected by parallel links 31, the links being located one at each side of said shanks, and the upper ends of the links are pivotally con-

needed to the upper eccentric near its rear end, while a sliding connection is effected between the links and the shank of the lower eccentric by passing a pin 31^a through the links and through the slot 20^b of the shank. The lower portions of the links, or those portions below the shank of the lower eccentric are carried downward and in direction of the body or standard 10 of the machine, and the lower extremities of the links are pivotally connected to a socket 32, at or near the center of the latter, the socket being pivotally connected with the standard 10 of the machine. The socket 32, is adapted to receive a handle 33, and when the machine is not in operation the handle may be removed from the socket and the machine is thereby rendered exceedingly compact.

When the operative mechanism is constructed as shown in Fig. 6 and as above described a maximum of purchasing power is obtained.

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

1. In a lifting machine, a guide, a lifting bar having movement therein and notched on one of its sides, dogs loosely mounted upon the lifting bar, cams pivoted to the guide adjacent to the notched side of the lifting bar and adapted to engage the lower surfaces of the said dogs, and a connection between the cams whereby they may be operated simultaneously, substantially as described.

2. In a lifting machine, the combination, with a guide, a lift bar having movement in the guide, and dogs loosely mounted upon the lifting bar, of cams one pivoted below each dog and having sliding engagement with the lower surface thereof, the cams being oppositely located, one lifting while the other allows the dog to drop, and a driving mechanism con-

nected with both cams, whereby they are simultaneously operated, as and for the purpose specified.

3. In a lifting machine, the combination, with the standard having two arms forming guides, and the lifting bar adapted to move therein, of dogs held on the said bar above each of the said arms, mechanism for actuating the dogs, and latches held to slide in the said arms so as to be adjustable, said latches being adapted to project from the said arms and to engage with the respective dogs, as and for the purpose set forth.

4. In a lifting machine, the combination, with the standard having two arms forming guides, and the lifting bar adapted to move therein, of dogs held on the said bar above each of the said arms, mechanism for actuating the dogs, and spring controlled latches having sliding movement in the said arms and each provided with a head adapted to engage a recess in the arm, the latches being also capable of turning in the arms to bring the heads out of engagement with the said recesses, as and for the purpose set forth.

5. In a lifting machine, the combination, with the guide, a lift bar having sliding movement in the guide, and spring-controlled latches likewise located within the guide, of dogs loosely mounted upon the lift bar, capable of gripping opposite sides thereof, cams or eccentrics engaging one with each dog, one cam being in a lifting position while the other is in a releasing position, and a driving connection between the two cams, whereby they are simultaneously operated, and a lift lever adapted for engagement with one of the dogs, as and for the purpose set forth.

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Witnesses:

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C. J. BROOKINS.