Feb. 2, 1926. 1,571,360

A. F. WILLIAMS

STACKING MACHINE

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Fig. 3.

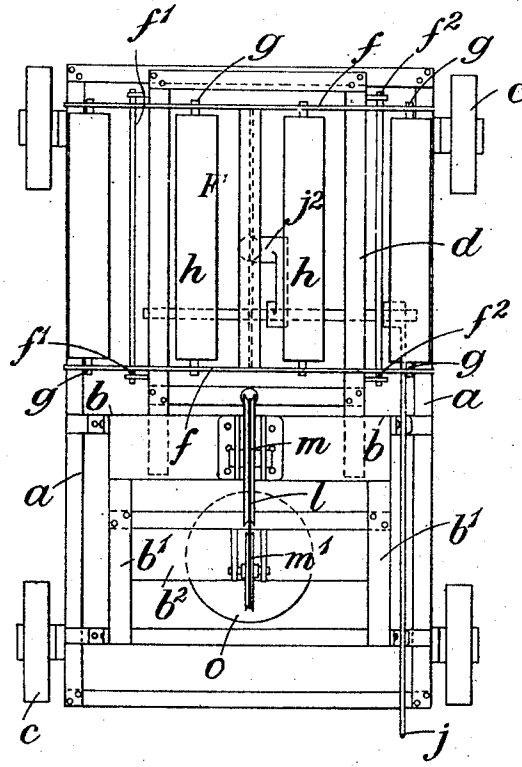


Fig. 1.

INVENTOR
ARTHUR FREDERICK WILLIAMS
By Charles St. Riches
Attorney

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Fig. 2.

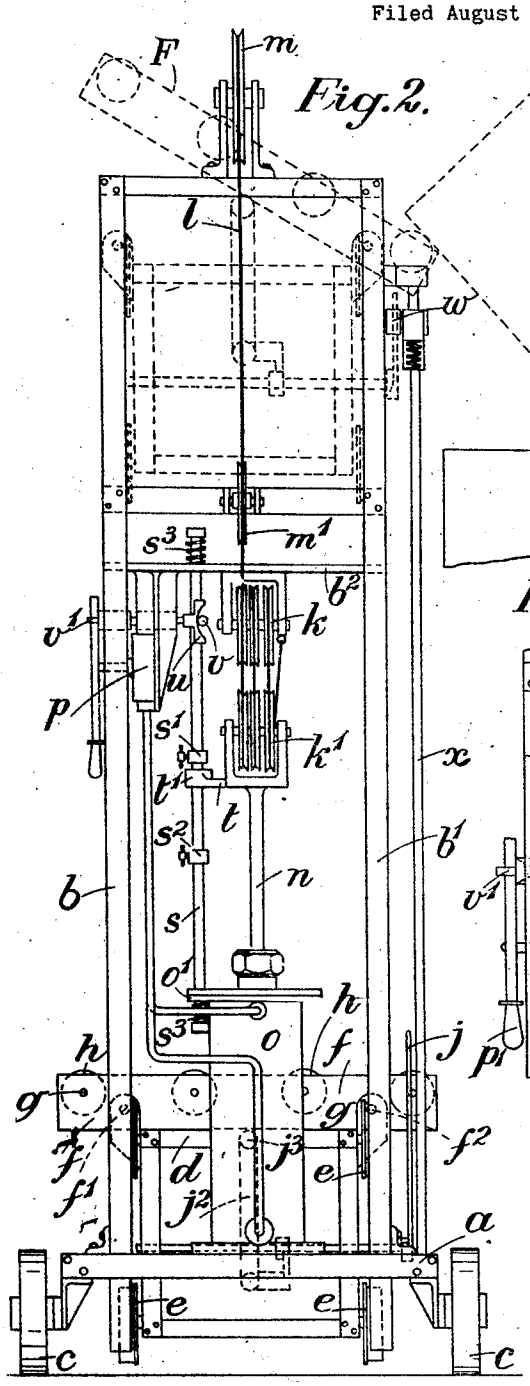


Fig. 4.

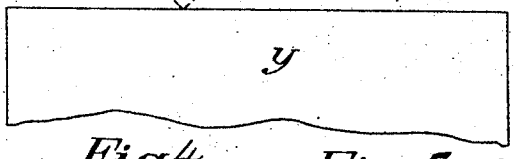
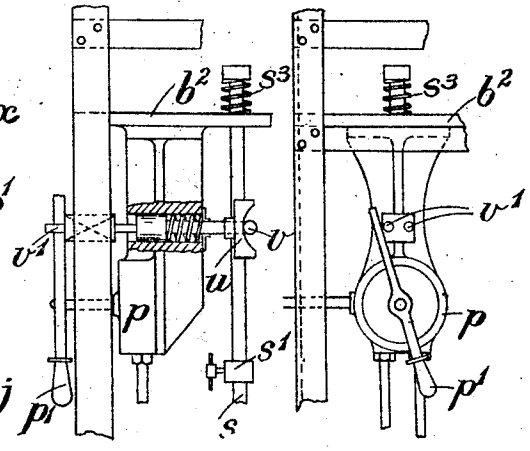


Fig. 5.



INVENTOR
ARTHUR FREDERICK WILLIAMS
By Charles H. Riches
Attorney

Patented Feb. 2, 1926. 1,571,360

UNITED STATES PATENT OFFICE.

ARTHUR FREDERICK WILLIAMS, OF LEYTONSTONE, ENGLAND.

STACKING MACHINE.

Application filed August 28, 1923. Serial No. 659,701.

To all whom it may concern:

Be it known that I, ARTHUR FREDERICK WILLIAMS, a subject of the King of England, residing at Leytonstone, Essex, England, have invented certain new and useful Improvements in Stacking Machines, of which the following is a specification.

This invention relates to stacking machines for raising and delivering crates, bales or other loads, and comprises an elevator cage slidably supported upon suitable standards so that it can be hoisted by means of ropes or the like, and provided with a tilting load-platform which can be brought to an inclined position for tipping or delivering the load.

The present invention comprises more particularly an improved stacking machine in which the load may be delivered to either side as required, the ascent being automatically stopped at the desired height and the delivery effected at approximately the same moment, preferably by means of adjustable stops mounted upon a trip-rod which is controlled by the movement of a pneumatic piston or other operating device.

The machine is so arranged that when it has once been set to deliver to any required height, a single operation of the control means is sufficient to lift the load, deliver it to the desired point and automatically shut off the power, the hoisting cage or table being then ready to return for the next load as soon as the control lever is reversed.

The invention also comprises an interlocking mechanism whereby the control lever is held in set position during the movement of the elevator cage but is returned automatically to the neutral or stop position as the cage reaches the end of its travel.

The invention is hereafter described with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation of a suitable form of construction of the improved stacking machine.

Figure 2 is an end view of the same, showing in dotted lines the delivery of a package to one side.

Figure 3 is a plan of the machine.

Figures 4 and 5 are detail views of the interlocking mechanism on a larger scale.

In the construction illustrated, the truck a is provided with wheels c carried on suitable axles c^1. Toward one end of the truck there is mounted thereon a double framework b b^1 of which each side has the shape of an A-frame with one vertical face, this frame-work being built up for example from angle-iron and its vertical face b forming a guide for the elevator cage or table d which travels thereon by means of pairs of flanged rollers e running on opposite sides of the angle bars forming the vertical face b.

At the upper surface of the cage or table is provided a tray F formed by two transverse rails f connected by parallel spindles g carrying rollers h to support the crates or other goods placed thereon. The two rails f are mounted on axes f^1 f^2, parallel to the roller spindles g, these axes being located towards the outer lateral edges of the cage, and being so arranged that the tray F may be tilted upwardly at either side, pivoting upon one or other of the axes f^1 f^2 according to the desired direction of delivery, the pivot pin at f^2 or f^1, respectively, being removed for the purpose.

A lever handle j is provided upon the cage, being pivoted at j^1 and adapted to operate a lifting rod j^2 whereby the tray F can be pushed upwards at its centre, this table then tilting to one or other side as desired.

The points j^3 at the ends of the connecting rod j^2 are preferably of the ball or universal type, allowing free movement in all directions.

The cage or travelling table d guided by the flanged rollers e is suspended by means of one or more ropes l, passing over guide sheaves m m^1 at the top and back of the framework and downwards to multiplying pulleys or tackle k k^1, of which the running block k is attached to the hoisting means, consisting in this case of the piston rod n of a vertical pneumatic cylinder o, secured upon the truck a between the frames b b^1, while the fixed block k^1 is attached to a cross member b^2 about the middle of the framework b b^1.

A vertical trip-rod s is arranged beside the piston rid n, being guided at its ends in a lug o^1 upon the cylinder o and in the cross member b^2 of the framework respectively; this rod s is controlled by springs s^3 which maintain it normally in its median position and is fitted with a pair of adjustable collars or stops s^1 s^2. The end of the piston rod n carrying the pulley block k is provided with a laterally extending tappet-arm t having an eye t^1 through which the trip-rod s passes, this eye being adapted

to engage the collars s^1 s^2 on the trip-rod at opposite ends of the reciprocating movement of the piston.

Compressed air is admitted to the cylinder o from any suitable source (not shown) through a valve p, preferably formed as a horizontal plug-cock regulating the inlet and exhaust to opposite ends of the cylinder in its two extreme positions, and being returned to its neutral or off position by suitable means; in the construction shown (see Figures 4 and 5), the handle p^1 of the valve forms a counterweight for this purpose.

The trip-rod s (see Figure 4) is provided at its upper end with a double cam slide u controlling by suitable means such as a roller v, a pair of spring latches v^1 which in the median position of the trip rod s project into the path of the plug-cock handle p^1, so as to hold the valve in set position until the movement of the pneumatic piston rod n brings its tappet-arm t t^1 into engagement with one of the stop collars s^1 s^2, adjusted according to the desired length of stroke; this engagement slides the trip rod s upwards or downwards, as the case may be, thereupon unlatching the plug-cock p, which returns automatically to neutral position, interrupting the power supply and opening the cylinder o to exhaust. Upon operation of this valve for the return stroke, the initial movement of the piston allows the spring-controlled trip-rod s to resume its median position, the roller v descending the cam u and the spring-latches v^1 then locking the plug-cock in the other position until the opposite movement of ascent or descent is completed.

Normally, compressed air would only be used for raising the table; the descent takes place by gravity.

The lever handle j for tilting the tray F may be operated by hand if desired, but for automatic working it is preferably engaged at a convenient point by a spring-controlled stop or trip device w adjustable upon a fixed vertical rod x, so that at the termination of the hoisting motion it will produce the lateral delivery of the load approximately at the same moment. The exact time of the delivery or tipping movement may be regulated by adjustment of the trip device on the stationary rod x, so as to take place before, at or shortly after the completion of the hoist, so that when the tilting table reaches the necessary angle the load will roll off on to the stack or into a container such as y (Figure 2) at the desired height. The adjustment of the trip device may also be varied in the case of a load such as sacks of material, to give a steeper tilt to the platform.

The downward motion of the table d will release the lever j and allow the tilting tray F to drop back into position.

It will be understood that the improved machine may also be employed for lowering goods from a stack or the like, and that the invention is not limited to the use of a penumatic cylinder. As will be obvious to those skilled in the art, the cylinder o may be worked by hydraulic pressure.

Having thus described my invention what I claim is:—

1. A stacking machine, comprising a table, means for guiding said table for vertical movement, a tray mounted upon said table, means connecting said tray to said table, said connecting means allowing said tray to tilt towards either of two opposite sides of said table on an axis adjacent to that side, a universally jointed lifting rod adapted to exert an upward thrust beneath the centre of said tray to produce a lateral tilting movement, and a lever operating said lifting rod, said lever being actuated automatically by the ascent of said table.

2. A stacking machine, comprising a table, means for guiding and hoisting said table, a tray mounted upon said table, pivotal connections between said tray and said table, said connections allowing said tray to tilt toward either of two opposite sides of said table, means for exerting an upward thrust beneath said tray midway between said connections, as said table reaches the end of its hoisting movement, a displaceable trip-rod, adjustable stops upon said trip-rod, said stops actuated by said hoisting means towards opposite ends of the movement of said table so as to displace said trip-rod, a control device for said hoisting means, and means for returning said control device to neutral position, said returning means being rendered operative by the displacement of said trip-rod.

3. A stacking machine, comprising a table, means for guiding and hoisting said table, a delivery tray mounted upon said table, pivotal connections between said tray and said table, said connections aligned with opposite sides of said table, means for tilting said delivery tray towards one or other side of said table, said tilting means including a lever carried by said table, a lifting rod operated by said lever, said lifting rod adapted to exert an upward thrust beneath said tray at a point midway between said pivotal connections, a stationary rod mounted parallel to the movement of said table, an adjustable stop upon said rod, said lever coming into engagement with said stop as said table reaches the end of its movement, and adjustable means for regulating the extent of said movement.

4. A stacking machine, comprising a table, means for guiding and hoisting said table, a delivery tray mounted upon said table on pivotal connections adjacent to opposite sides thereof, means for tilting said delivery

tray towards one or other side of said table, said tilting means exerting an upward thrust centrally beneath said tray as said table reaches the end of its movement, a control device determining the operation and the reversal of said hoisting means, means for holding said control device in set position during movement of said table, and adjustable means for releasing said control device to stop the movement as said table reaches the point at which delivery is to take place.

In testimony whereof I hereunto affix my signature.

ARTHUR FREDERICK WILLIAMS.