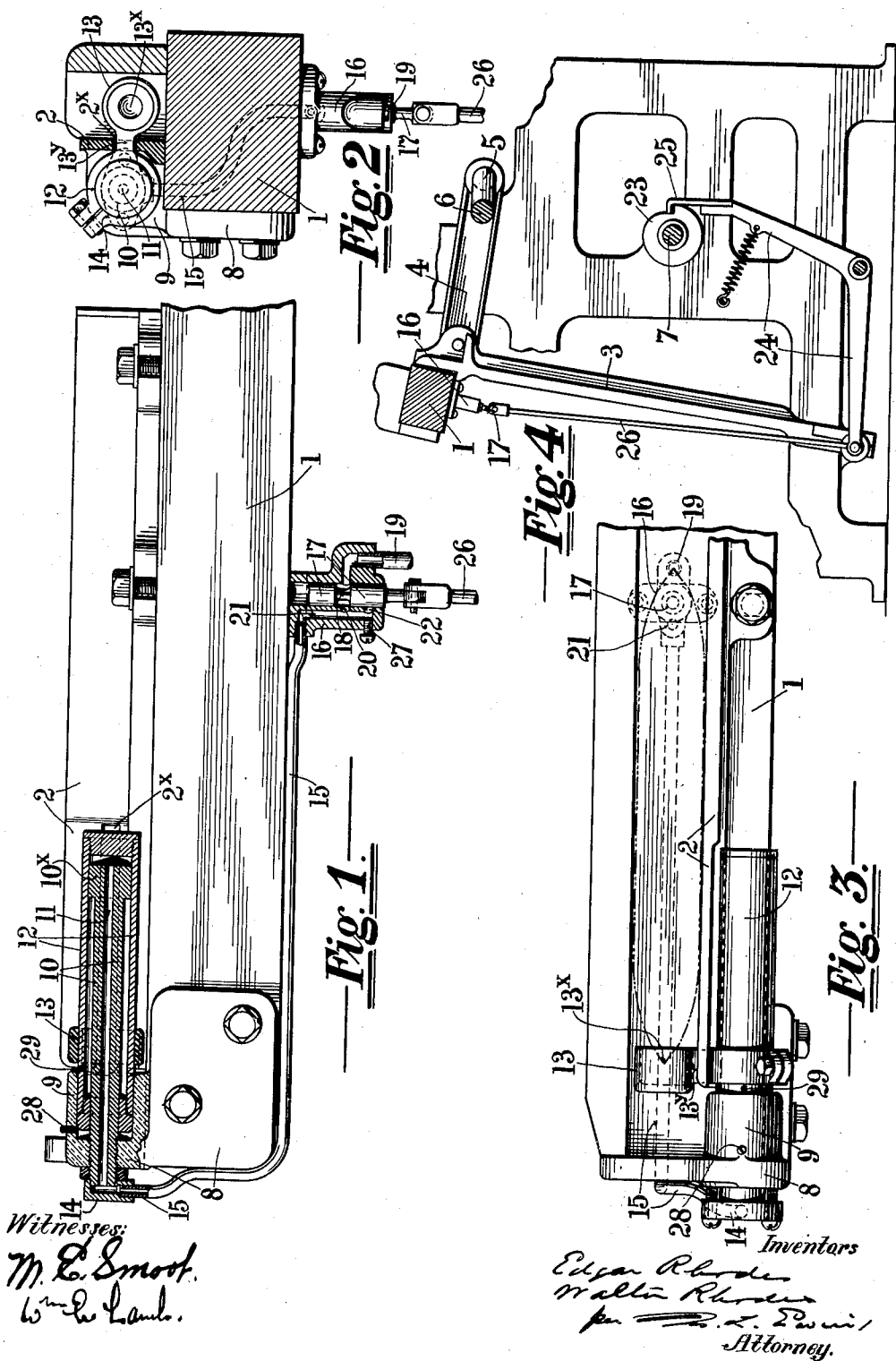


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PNEUMATIC PICKING MECHANISM.  
APPLICATION FILED JULY 25, 1910.

1,007,733.

Patented Nov. 7, 1911.



# UNITED STATES PATENT OFFICE.

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## PNEUMATIC PICKING MECHANISM.

1,007,733.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed July 25, 1910. Serial No. 573,714.

*To all whom it may concern:*

Be it known that we, EDGAR RHODES and WALTER RHODES, residing, respectively, at Scholes, near Leeds, and at Leeds, both in the county of York, England, and subjects of the King of Great Britain, have invented certain new and useful Improvements in Pneumatic Picking Mechanism, of which the following is a specification.

This invention relates to an improved pneumatic picking-mechanism, as hereinafter described, by which the shuttles of weaving looms may be actuated or propelled across the shed and checked when nearing the end of their travel ready for the return movement in a more efficient manner than has been possible with pneumatic picking-apparatus hitherto proposed.

According to our invention, we mount on each end of loom batten or lay a bracket carrying a horizontal cylindrical end sleeve provided with a centrally fixed inwardly projecting piston having a central longitudinal hole or aperture formed therein and being fitted with a working cylinder adapted to slide horizontally thereon and within the said fixed sleeve. To the working cylinder beyond the fixed end sleeve is attached a picking-head which extends outward at one side thereof so that its center is coaxial with the shuttle to be propelled, while to the outer or fixed end of the hollow piston is fitted a pipe by which compressed air is conducted thereto from a tank or other convenient source, and the said pipe is fitted with a valve which is operated by means of a cam and lever mechanism in such a manner as to allow the compressed air to pass in by way of the stationary hollow piston and actuate the working cylinder to effect the propulsion of the shuttle and also to control the exhaust from the said cylinder on the return movement to assist in retarding the shuttle. The valve is first operated by the cam and lever mechanism so as to allow the compressed air to pass along the feed pipe and through the stationary hollow piston, which has the effect of forcing outward the working cylinder carrying the picking-head by which the shuttle is actuated or propelled across the shed, and the said cylinder is formed near its outer end with a through aperture, which, after the shuttle has been propelled, passes on to or over the piston head whereby the remaining air in the cylinder between the

heads of the stationary piston is confined and acts as cushion at the end of the propelling stroke; while on the return movement of the shuttle, the valve through the medium of the cam and lever mechanism is opened to the exhaust so that the working cylinder is free to return upon its piston until the outer end of the said cylinder engages within the fixed end sleeve where a cushioning action is produced by the imprisoned air, while at the same time a further retarding movement may be obtained by throttling the exhaust from the cylinder through the medium of an adjusting screw situated in the exhaust port of the valve; and if desired, the fixed end sleeve may be fitted with an adjusting screw for controlling the exit of air therefrom on the return movement of the working cylinder.

By employing apparatus of the above described construction at each end of the loom batten or lay fitted with inlet and exhaust valves, the two arrangements may be timed in with each other so as to alternately propel the shuttle outward and then retard it on the return stroke in an efficient manner.

In order that the invention may be clearly understood, we will proceed to describe the same with reference to the accompanying drawings which show the arrangement as applied to one end of a loom batten or lay (the opposite end of the said batten or lay being fitted with a similar arrangement); wherein:—

Figures 1, 2 and 3 are respectively a sectional front elevation, a sectional end elevation and a plan, representing one end of a loom batten or lay fitted with a pneumatic picking-mechanism constructed in accordance with our invention; and Fig. 4 is an end elevation, drawn to a reduced scale, showing the general arrangement of our invention, as applied to a loom.

In the drawings, 1 is the loom batten or lay which is provided with a shuttle guard 2 and reciprocated through the medium of the rocking arm 3, connecting rod 4 and crank 5 from the crank shaft 6, and 7 is the second motion shaft which is rotated at half the speed of the crank shaft 6; all of ordinary construction.

According to our invention, we fix on the end of the loom batten or lay 1 a bracket 8 formed with a cylindrical sleeve 9 and provided with a centrally fixed inwardly pro-

jecting piston rod 10 formed with a piston 10<sup>x</sup>, and the piston rod 10 is formed with a through central hole 11 while the said piston rod 10 and its piston 10<sup>x</sup> are fitted with a working cylinder 12 adapted to slide horizontally thereon and within the fixed cylindrical sleeve 9. To the working cylinder 12 is attached a picking-head 13 having the center 13<sup>x</sup> of its striking part situated in line with the point of the shuttle (shown in dotted lines) to be propelled, and the said picking-head 13 is reduced at 13<sup>y</sup> to form a slide which passes within a longitudinal slot 2<sup>x</sup> formed in the guard 2. On the outer end of the hollow piston rod 10 is attached a hollow cap 14 fitted with a compressed air feed-pipe 15 communicating with a valve casing 16 fixed to the underside of the batten or lay 1, and the said valve casing 16 is fitted with a plunger-valve 17 formed with an annular recess 18 adapted to establish communication between the inlet pipe 19 (to which compressed air is supplied from any convenient source) and an inlet 20 which communicates by way of a passage 21 with the feed-pipe 15, and the said casing 16 is formed with an exhaust outlet 22 establishing communication between the passage 21 and the outer air when the valve 17 is raised. The valve 17 is operated from the second motion shaft 7 through the medium of a cam 23 mounted thereon in conjunction with a pivoted bell-crank lever 24 provided with a tappet 25 in connection with the cam 23 and a rod 26 connected to the said valve 17. The exhaust outlet 22 is provided with an air-controlling screw 27 and the cylindrical sleeve 9 is provided with an air-controlling screw 28, while the working cylinder 12 is formed with a small through air-hole 29.

Assuming the parts to be in the position shown in the drawings and the valve 17 having been moved into the inlet position (Fig. 1) by the cam 23 and lever 24 (Fig. 4), the compressed air passing in by way of the inlet pipe 19 passes by way of the inlet 20 and passage 21 into the feed pipe 15 and forward through the hollow piston rod 10, which has the effect of forcing outward the working cylinder 12 carrying the picking-head 13 by which the shuttle is actuated or propelled across the shed; the commencement of the outward movement of the working cylinder 12 being rendered slow by a vacuum set up within the cylindrical end sleeve 9, while on the cylinder 12 leaving the latter its outward movement becomes very rapid until when nearing the end of the propelling stroke the hole 29 formed in the said cylinder 12 comes on to or over the piston 10<sup>x</sup> and confines the remaining air within the cylinder 12 which acts as a cushion thereto. The valve 17 after having fed the compressed air to the working cylinder 12 for the propelling stroke as just described

is raised by the cam 23 and lever 24 so as to open the exhaust outlet 22, when on the return movement of the shuttle the working cylinder 12 is returned upon the piston rod 10 and piston 10<sup>x</sup> which thus exhausts the air by way of the outlet 22 until the outer end of the said cylinder engages within the cylindrical sleeve 9 where a cushioning action is produced by the imprisoned air controlled by the screw 28, while at the same time a further retarding movement is obtained by throttling the exhaust from the cylinder 12 by adjusting the screw 27 in connection with the exhaust outlet 22.

It will be seen that by employing the pneumatic picking-mechanism at each end of the loom batten or lay 1 and fitting each of the said mechanisms with a compressed air inlet and exhaust valve as above described, the two arrangements may be timed in with each other so as to alternately propel the shuttle outward and then retard it on the return stroke in an efficient manner; and further that the particular construction of the mechanism employed is such as not to project beyond the end of the loom.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In a pneumatic picking-mechanism for looms—the combination with the loom batten or lay of a bracket fixed at each end thereof, a horizontal cylindrical sleeve formed on each end bracket and provided with a centrally fixed inwardly projecting hollow piston rod and piston, a working cylinder slidable upon the hollow piston rod and piston and carrying a picking-head, said working cylinder when in its normal position having its outer end engaging within the cylindrical sleeve, a pipe connecting the outer end of the hollow piston rod with a compressed air supply, and means adapted to admit the compressed air by way of the pipe and hollow piston rod to the working cylinder to force the same outward and cause the picking-head to propel the shuttle across the shed and to allow the shuttle on its return movement to return the working cylinder to its said normal position.

2. In a pneumatic picking-mechanism for looms—the combination with the loom batten or lay of a bracket fixed at each end thereof, a horizontal cylindrical sleeve formed on each end bracket and provided with a centrally fixed inwardly projecting hollow piston rod and piston, a working cylinder slidable upon the hollow piston rod and piston and carrying a picking head, said working cylinder when in its normal position having its outer end engaging within the cylindrical sleeve, a pipe connecting the outer end of the hollow piston rod with a compressed air supply, an inlet and exhaust valve adapted to admit the compressed air by way of the pipe and hol-

low piston rod to the working cylinder to force the same outward and cause the picking-head to propel the shuttle across the shed and to allow the shuttle on its return movement to return the working cylinder to its normal position, means for checking the movement of the working cylinder when nearing the end of the propelling stroke, and means for checking the movement of the working cylinder during its return stroke.

3. In a pneumatic picking-mechanism for looms—the combination with the loom batten or lay of a bracket fixed at each end thereof, a horizontal cylindrical sleeve formed on each end bracket and provided with a centrally fixed inwardly projecting hollow piston rod and piston, a working cylinder slidable upon the hollow piston rod and piston and carrying a picking-head, said working cylinder when in its normal position having its outer end engaging within the cylindrical sleeve, a pipe connecting the outer end of the hollow piston rod with a compressed air supply, an inlet and exhaust valve adapted to admit the compressed air by way of the pipe and hollow piston rod to the working cylinder to force the same outward and cause the picking-head to propel the shuttle across the shed and to allow the shuttle on its return movement to return the working cylinder to its normal position, means for checking the movement of the working cylinder when nearing the end of the propelling stroke, and means for checking the movement of the working cylinder during its return stroke, together with means for finally checking the working cylinder at the end of its return or inward stroke and for causing a vacuum to be set up within the cylindrical sleeve at the commencement of the outward

or propelling stroke of the working cylinder.

4. In a pneumatic picking-mechanism for looms—the combination with the loom batten or lay of a bracket fixed at each end thereof, a horizontal cylindrical sleeve formed on each end bracket and provided with a centrally fixed inwardly projecting hollow piston rod and piston, a working cylinder slidable upon the hollow piston rod and piston and carrying a picking head, said working cylinder when in its normal position having its outer end engaging within the cylindrical sleeve, a pipe connecting the outer end of the hollow piston rod with a compressed air supply, an inlet and exhaust valve, a cam and lever mechanism adapted to operate said valve to admit the compressed air by way of the pipe and hollow piston rod to the working cylinder to force the same outward and cause the picking head to propel the shuttle across the shed and to allow the shuttle on its return movement to return the working cylinder to its normal position, means for checking the movement of the working cylinder when nearing the end of the propelling stroke, and means for checking the movement of the working cylinder during its return or inward stroke, together with means for finally checking the working cylinder at the end of its return or inward stroke and for causing a vacuum to be set up within the cylindrical sleeve at the commencement of the outward or propelling stroke of the working cylinder.

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Witnesses:

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