

Oct. 1, 1957

C. R. KRONOFF ET AL
PICKING MECHANISM FOR LOOM

2,808,074

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2 Sheets-Sheet 1

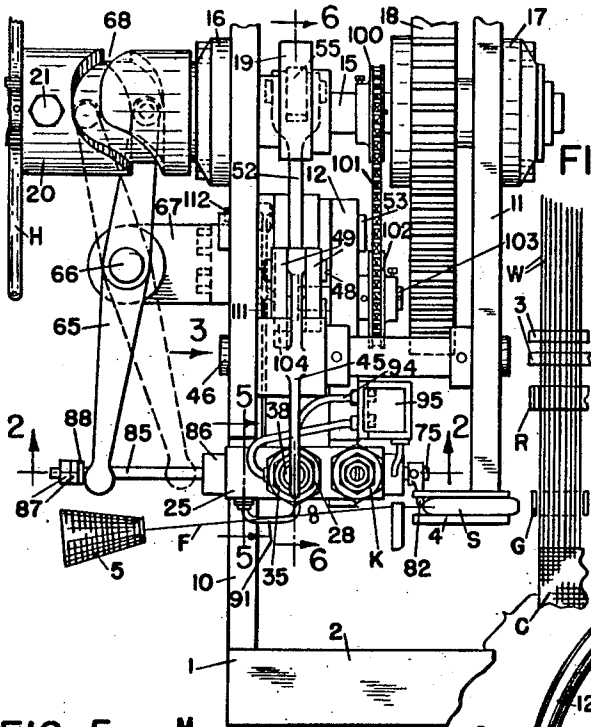


FIG. 1

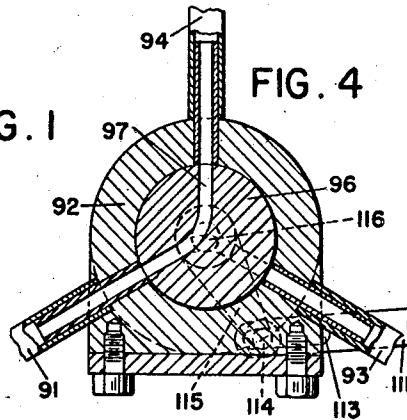


FIG. 4

FIG. 2

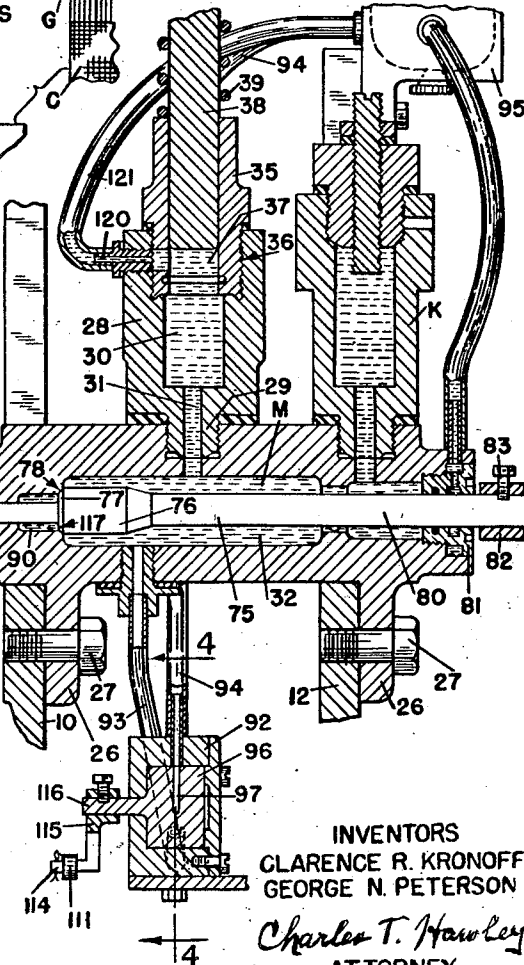


FIG. 5

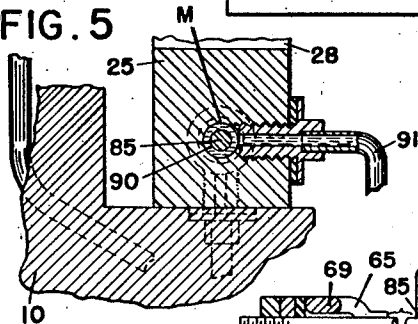
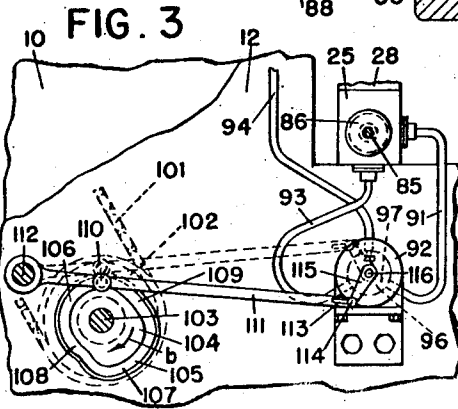


FIG. 3



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FIG. 6

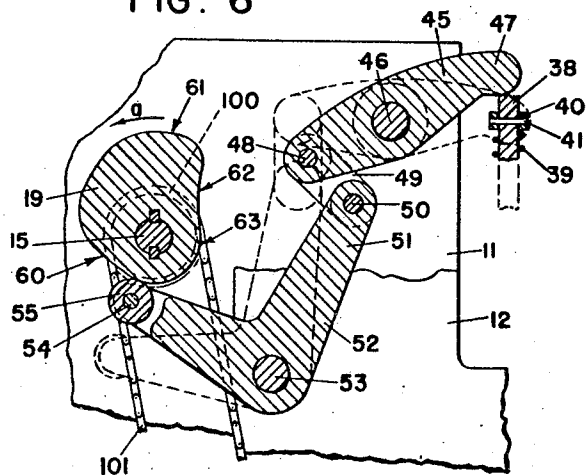
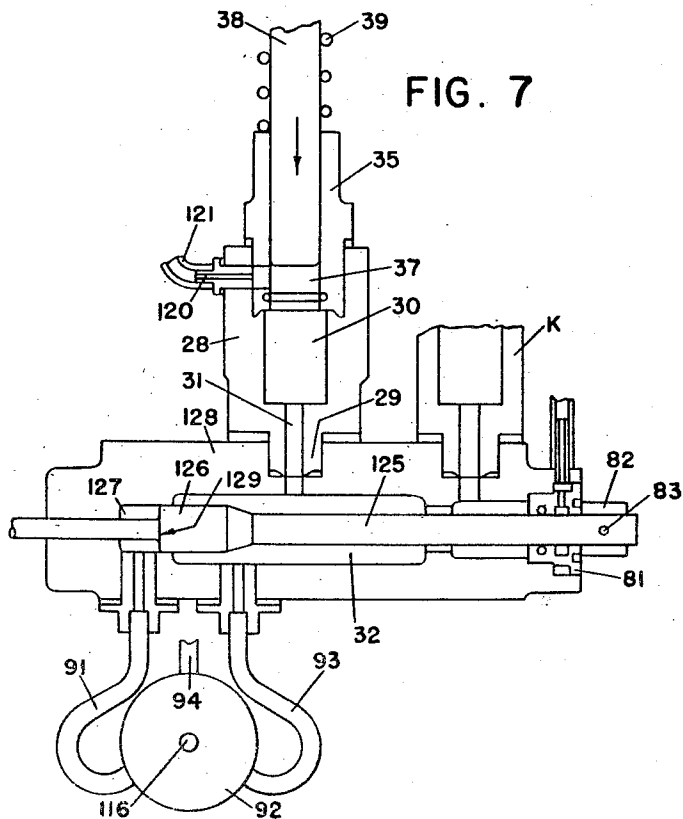


FIG. 7



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2,808,074

PICKING MECHANISM FOR LOOM

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Application April 26, 1956, Serial No. 580,764

16 Claims. (Cl. 139—142)

This is a continuation in part of our copending application Serial No. 376,807, filed August 27, 1953.

This invention relates to improvements in picking mechanism from loom shuttles and it is the general object of the invention to provide improved means for initiating a picking operation when the latter is accomplished by means of a nongaseous compressible medium.

Picking mechanism set forth in application Serial No. 371,772, filed August 3, 1953, by L. J. Hooper and C. R. Kronoff, now Patent No. 2,773,517, one of the present applicants, sets forth means whereby a shuttle picking plunger slidable on hollow means through a firing chamber can be held in firing position by pressures built up in the medium due to compression thereof, after which mechanical means acts to unseat the plunger so that the pressure developed in the medium in the firing chamber can act on the plunger to effect the picking stroke thereof.

It is an important object of the present invention to provide means in such a picking mechanism wherein the tripping of the plunger or shuttle actuator can be effected without requiring the mechanical trip set forth in the aforesaid application.

It is a further object of our invention to supply the hollow means with a tripping chamber normally communicating with the firing chamber but separable from it by the plunger when the latter is in firing position, and connect the medium in the tripping chamber with the atmosphere while the medium in the firing chamber is disconnected from the atmosphere and connected to the compressed medium in the firing chamber, whereupon the plunger will be caused to have a picking stroke.

It is a still further object of the invention to provide control means for the tripping chamber to connect it alternately to atmosphere and the firing chamber. As shown herein the control means includes a valve of the three-way type, but the means for opening and closing the passages communicating with the tripping chamber is not necessarily limited to a valve of this type.

It is a further important object of the invention to provide an improved method for tripping the plunger which consists in the steps of compressing the medium in the firing chamber while the latter is separated from the tripping chamber by the plunger and the medium in the tripping chamber is at low pressure, such as atmospheric, and thereafter creating substantially the same pressure in the medium in the tripping chamber as that which exists in the firing chamber to initiate the picking stroke of the plunger. A further feature of the method is the step which interconnects the medium in the firing chamber and that in the tripping chamber in order to initiate motion of the plunger.

In order that the invention may be clearly understood reference is made to the accompanying drawings which illustrate by way of example two embodiments of the invention and in which:

Fig. 1 is a plan view of the left hand end of the loom having the preferred form of invention applied thereto,

Fig. 2 is an enlarged vertical section on line 2—2, Fig. 1, parts being broken away,

Fig. 3 is a view looking in the direction of arrow 3, Fig. 1, parts being broken away and showing the control for the three-way valve,

Fig. 4 is an enlarged detailed vertical section on line 4—4, Fig. 2, through the three-way valve,

Fig. 4 is an enlarged detailed vertical section on line 4—4, Fig. 2, through the three-way valve,

Fig. 5 is an enlarged vertical detail section on line 5—5, Fig. 1,

Fig. 6 is a vertical section, parts omitted, on line 6—6, Fig. 1, and

Fig. 7 is a diagrammatic view similar to part of Fig. 2 showing the modified form of the invention.

Referring to Fig. 1, the loom frame 1 has a breast beam 2 over which passes the cloth C. The warp threads W extend rearwardly from the cloth and pass through a reed R and also through harness frames two of which are shown at 3. Shuttle guide means G are shown forward of the reed in a position to register with a shuttle S which is in a shuttle box 4 and has attached thereto a filling thread F drawn from a stationary weft package 5. At the proper time in the loom cycle the shuttle S will be picked and will pass through the warp shed and through the guides G, drawing the filling thread F behind it as the thread unwinds from the package 5. It is to be understood that the parts thus far described with respect to the shuttle and weft are for illustrative purposes only, and also that details with respect to tensioning, pullback, etc., of the weft thread F are omitted, since the invention is concerned primarily with picking a shuttle one example of which is shown at S.

Included in the construction of the loom frame 1 is a loomside 10 and two vertical frame members 11 and 12. The latter two members as well as the loomside 10 rest on the floor and represent parts of the rigid structure of the loom frame.

A rear shaft 15 is rotatable in bearings 16 and 17 mounted respectively on the frame members 10 and 11. Shaft 15 is driven by a gear 18 secured thereto and has keyed thereto a cam 19 for compressing the liquid. A barrel cam 20 is preferably not keyed to shaft 15 but is secured thereto by a set screw 21 so that its angular position around the shaft can be adjusted with respect to cam 19. The gear 18 will be connected to driving mechanism not shown and will be rotated either once for each pick of the loom or once every second pick of the loom, depending upon whether the mechanism shown in Fig. 1 is to operate every pick of the loom or on alternate picks of the loom.

An elongated hollow housing or means 25 shown more particularly in Fig. 2 rests on the tops of the frame members 10 and 12 and has arms 26 to receive screws 27 which bolt the housing firmly to the frame members which resist downward motion of the housing 25. A compression member 28 has the lower end 29 thereof screw threaded into the upper part of the housing 25, and has a vertical compression compartment or chamber 30 which communicates by means of passage 31 with a horizontal elongated enclosed firing chamber 32 in housing 25. A cylinder 35 is screw threaded as at 36 into the upper end of the member 28 and has a vertical bore 37 which receives a closely fitted compressing means shown as a piston 38. A compression spring 39 surrounds the piston 38 between the top of the cylinder 35 and a collar 40 secured by a pin 41 to the upper end of the piston. The purpose of the spring is to exert an upward force on the piston tending to lift it to the position shown in Fig. 2.

For operation of the piston there is provided a lever

45 rockable on a pin 46 mounted on the loom frame members 10 and 11, see Figs. 1 and 9. The right-hand end 47 of lever 45, Fig. 6, is positioned to engage the top of the piston 38, while the left-hand end thereof is pivoted as at 48 to the upper ends of links 49 the lower ends of which are pivoted at 50 to arm 51 of an operating lever 52. The latter lever is rockable on a pin 53 supported by the frame members 10 and 12 and has a stud 54 provided with a roll 55 for engagement with the previously mentioned cam 19. The arm 51 of lever 52 and the links 49 serve as a toggle connection between the cam 19 and the lever 45, this toggle, however, preferably never reaching a locked position. The upward force exerted by the spring 39 tends to break the toggle to move the parts to the position shown in full lines in Fig. 6.

Cam 19 has an incline 60 which may end in a slight high dwell designated at 61 in Fig. 6. The cam also has a decline 62 leading to a low dwell 63. The cam turns in the direction of arrow *a*, Fig. 6.

Shown to the right of Fig. 2 is checking means designated herein generally at K. This checking means forms no part of the present invention but may be similar to a corresponding part set forth in the aforesaid application. It is shown here for the purpose of completing the disclosure but is not claimed herein.

Placing means or mechanism for a purpose to be described is operated by the previously mentioned barrel cam 20 and includes a lever 65 pivoted on a stud 66 carried by a stand 67 secured to the loomside 10. The upper end of lever 65 cooperates with a groove 68 in cam 20 to oscillate lever 65 as the cam rotates. The lower end of lever 65 may be forked as at 69, Fig. 2. The cam 20 causes lever 65 to rock back and forth as suggested by the full line and dotted line positions shown at Fig. 1. In the present instance the only motion of the lever 65 which is utilized is that from the dotted line to the full line position when the lever has a placing stroke. Movement of the lever from the full line to the dotted line position is merely for the purpose of moving the lever to a noninterfering position and the lever does not perform a tripping operation as in the aforesaid application.

The matter thus far described except as noted may be similar to the structure set forth in said copending application.

In the preferred form of the invention there is provided a shuttle actuator plunger designated generally at 75 having a head 76 chamfered at 77 at the left end thereof, Fig. 2, for engagement with a seat 78 formed on the hollow means 25. The actuator 75 has a stem 80 extending from the right-hand end of the head 76 and passing through a bearing 81. A picker 82 for the shuttle is secured to stem 80 by set screw 83 as shown in Figs. 1 and 2.

Extending from the left-hand end of the head 76 is a second stem 85 having a diameter less than that of the stem 80 slidable in a bearing 86 on the hollow means 25. The left end of stem 85 is provided with means for cooperating with the forked end 69 of lever 65. As shown in Fig. 2 this means includes nuts 87 on the end of the stem 85 and a compressible washer 88 between the nuts and the lever 65. The actuator plunger is preferably circular in all of its cross sections transverse of the axis thereof and is mounted to slide in the bearings 81 and 86. This form of the actuator may be substantially the same as that set forth in the aforesaid application.

In carrying the preferred form of the invention into effect there is provided a tripping chamber 90 which is aligned with and normally communicates with the firing chamber 32. The tripping chamber communicates by means of pipe 91 with a control means therefor shown here as a three-way valve 92. The valve also communicates by means of pipe 93 to the firing chamber, and a third pipe 94 leads from the valve to the reservoir 95 shown in Figs. 1 and 2.

The valve 92 has a rotary part 96 provided with a passage 97 which, depending upon the position of the rotary

part 96, can hydraulically connect the tripping chamber either to the reservoir which is at atmospheric pressure or to the firing chamber. When the valve connects the tripping chamber to the firing chamber it disconnects the tripping chamber from the reservoir.

The control means for the tripping chamber includes operating mechanism for the rotary part 96 of the valve. This mechanism, shown in Figs. 1, 3 and 6, includes a sprocket wheel 100 secured to shaft 15 and meshing with a chain 101 which is trained around a second sprocket wheel 102 secured to a shaft 103 journaled in the loom frame parts 10 and 12. Secured to shaft 103 is a cam 104 having a groove 105 made with a low dwell 106, a high dwell 107, an incline 108 and a decline 109. Fitted into the groove 105 is a roll 110 on lever 111 rockable about a fixed stud 112 and having the end thereof as shown at the right of Fig. 3 provided with a slot 113. This slot receives a stud 114 on an arm 115 which is secured to a stem 116 rotating with the rotary part 96 of valve 92, see Fig. 2. As cam 104 is rotated by the chain the various parts of the cam groove will rock the part 96 of the valve first in one direction and then in the opposite direction for purposes which will be set out in more detail hereinafter. The valve part 96 will be in its normal position shown in Fig. 4 when arm 115 is down due to the fact that roll 110 is in the low dwell 106 of groove 105, but will be moved to its tripping position when arm 115 has been turned in a clockwise direction from the full line position to the dotted line position shown in Fig. 3 due to movement of roll 110 up the incline 108. Cam 104 turns in the direction of arrow *b*, Fig. 3, and the tripping position of passage 97 is shown in dotted lines, Fig. 4.

The firing chamber contains a medium M which also extends into the parts of the mechanism communicating with the firing chamber and fills these parts so that there will be no air bubbles in the system. The medium may be oil or a light grease, but we have also found that the picking mechanism will operate satisfactorily if the medium is a comparatively thick grease having a density of 32, or having the consistency, for instance, of that of a petroleum jelly. It is not essential that the medium have the property of flow, but it should be non-gaseous and compressible.

In the operation of the preferred form of the invention the placing lever 65 will be moved to the full line position shown in Fig. 1 to move plunger 75 to firing position with the head 76 against the seat 78, after which the piston 38 will be pushed down into the compressing chamber 30 to compress the firing medium within the chamber 32. At this time the valve 92 is in the normal position shown in Fig. 4 with the tripping chamber disconnected from the firing chamber but exposed to atmospheric pressure through pipe 94. The head 76 will therefore be held in the position shown in Fig. 2 due to the fact that the pressure developed within the firing chamber is much greater than atmospheric pressure, and also because the diameter of head 76 is greater than that of stem 80. The cam 104 is so timed that upon completion of the down stroke of the piston 38, or at a time when it is desired to initiate the picking operation, the rotary part 96 of the valve 92 will have turned to place the passage 97 in the dotted line position shown in Fig. 4 to connect the firing chamber 32 with the tripping medium in chamber 90 and disconnect the latter chamber from the atmosphere. Due to the fact that stem 85 has a diameter less than that of stem 80 the left hand end of the head 76 will have an area indicated at 117 in Fig. 2 transverse of the axis of plunger 75 in contact with the compressed medium in the tripping chamber and larger than any transverse area of the head in the firing chamber. This latter transverse area is determined by the difference in diameters of the head 76 and stem 80. The force acting on area 117 will therefore exceed any force acting to hold head 76 against seat 78 and the head and plunger will move

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to the right from the position shown in Fig. 2. The area 117 will now be acted upon by the pressure of the medium M in the firing chamber and the plunger will be moved to the right, Fig. 2, on a shuttle picking stroke.

During continued operation the piston 38 will be raised or returned to the position shown in Fig. 2 with the lower end of the piston above a passage 120 leading into the bore 37 and communicating with a pipe 121 which leads to the reservoir 95. The medium will at this time therefore be at atmospheric pressure and the valve can be returned to the full line position shown in Fig. 4. It is desirable that the tripping chamber 90 be kept in hydraulic communication with the firing chamber until pressure in the medium in the latter has been restored to atmospheric pressure, after which the rotary part 96 of the valve can return from the tripping to the normal position thereof shown in full lines, Fig. 4, without risk that the medium trapped in the tripping chamber will be at super-atmospheric pressures. In this way escape of the medium from the tripping chamber through pipe 91 and passage 97 to the reservoir will be avoided.

In the modified form of the invention shown in Fig. 7 much of the structure already described will be used, the chief difference over the preferred form being the head of the actuator plunger and the tripping chamber. The modified picking actuator plunger 125 will be similar to the actuator 75 except that its head 126 will not be formed with the chamfered part 77 but will slide into a tripping chamber 127 of substantially the same diameter as that of the head 126. The hollow means 128 will be similar to the means 25 except that it is not formed with the seat 78. The placing lever 65 when moving from the dotted line to the full line position, Fig. 1, will have a somewhat greater stroke than in the preferred form to move the left end of the head 126 into the tripping chamber 127, after which the operations will be substantially the same as already described for the preferred form.

It is to be understood that the head 126 will have a close sliding fit with the tripping chamber 127 and has an area 129 similar to but larger than area 117. Also, some form of stop is desirable to limit movement of the actuator plunger 125 to the left as viewed in Fig. 7. As shown in Fig. 7 the picker 82 serves as a stop by its engagement with the bearing 81, but this is only one form of stop which may be employed to limit the amount of motion of the head 126 into the tripping chamber 127 and the invention is not limited to the use of the picker as a stop. It will be understood that the compressible washer 88 is provided to accommodate any slight excess motion on the part of lever 65 when the latter is performing its placing operation after the stop has arrested movement of the plunger to the left. This will also be true in the preferred form of the invention.

With respect to the two forms of the invention it should be noted that when the plunger has been moved to its firing position it separates the firing chamber from the tripping chamber. Thus, in Fig. 2 when the head 76 is against the seat 78 direct communication between the chambers 32 and 90 for the medium is prevented, and in the modified form entry of the left end of the head 126 into tripping chamber 127 will separate the latter from the firing chamber. In the modified form development of high pressures in the tripping chamber 127 will act on area 129 at the left-hand end of the head 126 to initiate movement thereof to the right in a manner similar to that described for the preferred form.

A further feature of the invention relates to manual operation of the loom when it is desired to effect a pick-out operation. A handwheel H secured to the shaft 15 as shown on Fig. 1 turns with the shaft and when a pick-out operation is to be made the loom will be operated by power during the time the incline 60 of cam 19 is depressing the plunger 38, after which the loom will be stopped with the dwell 61 engaging the compressing means or lever 52. At this time the rotary valve has not yet opened

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and the handwheel can then be manipulated to turn the shaft 15 and cam 19 without undue effort to turn the valve to connect the medium in the tripping chamber with the medium in the firing chamber to effect picking of the shuttle.

From the foregoing it will be seen that the invention sets forth simple means for tripping the actuator plunger from its firing position by means of a tripping chamber which will be at atmospheric pressure while the plunger is in its firing position and pressures are being developed within the medium of the firing chamber. At the time in the cycle of the loom when it is desired to effect picking of the shuttle the medium in the tripping chamber will be connected to the medium in the firing chamber so that the pressure on both sides of the head of the plunger will be substantially the same and the medium in the tripping chamber, because of the greater transverse effective area of the head contacting it, will initiate or trip the plunger into operation. In both forms of the invention the head when in firing position will separate the firing and tripping chambers and accumulating pressures within the firing chamber due to compression of the medium therein will hold the head in firing position. In the preferred form the seat 78 acts as a stop to limit left-hand movement of the plunger 75, Fig. 2, whereas in the modified form of the invention a stop shown herein as the picker 82 performs the same function. The rotary valve 92 and cam 104 constitute a control means for the tripping chamber, the cam and parts associated with it being operating means for the valve. The three-way valve is not the only means by which control of the tripping chamber can be exercised, since it will be sufficient if the control means maintains the medium in the tripping chamber at atmospheric pressure while the plunger is in the firing position and pressure is being developed within the firing chamber and then causes an increase in the pressure of the medium in the tripping chamber to perform the tripping operation while the tripping chamber is disconnected from atmospheric pressure. Also, the cam 104 and its driving mechanism including the chain 101 maintains a timed relation between the operation of the valve 92 and the reciprocation of the piston 38. It will also be seen that manual means are provided for opening the rotary valve while the dwell area 61 of cam 19 engages the lever 52 after the power stroke for compressing the medium in the firing chamber has been completed.

Having now particularly described and ascertained the nature of the invention and in what manner the same is to be performed, what is claimed is:

1. In picking mechanism for a loom shuttle, hollow means having therein enclosed aligned firing and tripping chambers filled with a nongaseous compressible medium and normally opening into each other, a shuttle actuator mounted for movement on said hollow means passing through said chambers, a control means for said tripping chamber assuming two positions in the operation of the picking mechanism in one position of which said control means exposes the medium in the tripping chamber to atmospheric pressure, a placing means to move the actuator into firing position to which position said actuator separates the medium in the firing chamber from the medium in the tripping chamber and causes a part of said actuator to contact the medium in the tripping chamber, the transverse effective area of said part of the actuator exposed to the medium in the tripping chamber being greater than the transverse effective area of the part of the actuator exposed to the medium in the firing chamber, and means to compress said medium in the firing chamber while said control means is in said one position, said control means thereafter moving to the other position thereof to disconnect the tripping chamber from atmospheric pressure and connect the medium under pressure in the firing chamber with the medium in the tripping chamber to cause the latter medium due to contact with

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said part of the actuator to move said part into the firing chamber, whereupon the medium in the firing chamber causes said actuator to have a shuttle picking motion.

2. In picking mechanism for a loom shuttle, hollow means including enclosed aligned and normally communicating firing and tripping chambers containing a nongaseous compressible medium, the medium in the tripping chamber being normally at atmospheric pressure, an actuator plunger for the shuttle slidable on said hollow means passing through said chambers and having thereon intermediate the ends thereof a head formed with a surface facing the tripping chamber, means to place the plunger in firing position in which position said head separates the medium in the tripping chamber from the medium in the firing chamber and locates said surface into contact with the medium in the tripping chamber, the transverse effective area of said surface exposed to the medium in the tripping chamber being greater than the transverse effective area of the part of the actuator exposed to the medium in the firing chamber, stop means to prevent motion of the plunger in a direction from the firing chamber toward the tripping chamber when the plunger is in firing position, means to compress the medium in the firing chamber while the medium in the tripping chamber is at atmospheric pressures, and means thereafter disconnecting the medium in the tripping chamber from atmosphere pressure and connecting it to the medium under compression in the firing chamber, the medium in the tripping chamber thereupon moving said surface into the firing chamber and the medium in the latter chamber thereupon acting on said surface to give said plunger a shuttle picking stroke.

3. The picking mechanism set forth in claim 2 wherein said plunger has a stem of given diameter slidable on said hollow means and extending from one side of the head through the tripping chamber and said plunger has another stem of larger diameter than that of the first stem extending from the opposite side of the head slidable on said hollow means and having a part thereof located in the firing chamber when the plunger is in firing position.

4. The picking mechanism set forth in claim 2 wherein said stop means is a seat on the hollow means at the end of the firing chamber adjacent to the tripping chamber engaging said head when the plunger is in firing position.

5. In picking mechanism for a loom shuttle, hollow means enclosing aligned normally communicating firing and tripping chambers containing a nongaseous compressible medium, an actuator plunger which during operation of the picking mechanism occupies a firing position and then moves from said firing position on a shuttle picking stroke, said plunger being slidable on said hollow means and passing through said firing and tripping chambers and having a head thereon separating the media in said chambers when the plunger is in firing position, the transverse effective area of said head exposed to the medium in the tripping chamber being greater than the transverse effective area of the part of the actuator in the firing chamber, control means for the tripping chamber which during operation of the picking mechanism first assumes normal position and then assumes a tripping position and when in normal position connects the medium of the tripping chamber with the atmosphere and when in tripping position connects the medium in the firing chamber to the medium in the tripping chamber and disconnects the latter medium from the atmosphere, and means to compress the medium in the firing chamber when the plunger is in firing position and the control means is in normal position, the control means thereafter assuming the tripping position thereof to establish force transmitting relation between the compressed medium in the firing chamber and the medium in the tripping chamber, whereupon the latter medium moves the head to a position to enable the compressed medium in the firing chamber to cause said picking stroke of the plunger.

6. The picking mechanism set forth in claim 5 wherein

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said control means is a valve provided with a rotary part which when in one position thereof disconnects the medium in the firing chamber from the medium in the tripping chamber and connects the latter medium to the atmosphere and when in another position thereof connects the medium in the firing chamber to the medium in the tripping chamber and disconnects the latter medium from the atmosphere.

7. In picking mechanism for a loom shuttle, hollow means providing a firing chamber containing a nongaseous compressible firing medium under superatmospheric pressures and providing also a tripping chamber containing a nongaseous compressible tripping medium at substantially atmospheric pressure, a shuttle picking actuator extending through said chambers having an area of given size transverse of the axis thereof contacting the tripping medium and having also an area transverse of the axis thereof of less size than said given size in the firing chamber contacting the firing medium and cooperating with said firing medium to hold the actuator in a firing position which separates the tripping medium from the firing medium, and means to connect the firing medium to the tripping medium to increase the pressure of the latter medium to enable the tripping medium in cooperation with said area of given size to move the latter to a position to be acted upon by the firing medium, whereupon the latter causes a shuttle picking stroke of the actuator.

8. The picking mechanism set forth in claim 7 wherein the actuator is an elongated plunger having a head thereon which separates the tripping medium from the firing medium when the actuator is in said firing position.

9. In picking mechanism for a loom shuttle, hollow means containing firing and tripping chambers, a shuttle picking actuator extending through the chambers and movable on the hollow means, a nongaseous compressible medium in the firing chamber which is compressed to increase the pressure thereof during operation of the picking mechanism, a nongaseous compressible medium in the tripping chamber which is at substantially atmospheric pressure while the medium in the firing chamber is being compressed, and control means for the tripping chamber effective after the medium in the firing chamber is compressed to connect the medium in the firing chamber through the control means to the medium in the tripping chamber, the medium in the firing chamber when compressed being effective to hold the actuator stationary in firing position on the hollow means to separate the media in said chambers as long as the medium in the tripping chamber is at atmospheric pressure, the transverse effective area of the part of the actuator exposed to the medium in the tripping area being greater than the transverse effective area of the part of the actuator exposed to the medium in the firing chamber, and the medium in the tripping chamber when connected to the medium in the firing chamber being effective to move the actuator on the hollow means to a position which enables the medium in the firing chamber to give the actuator a shuttle picking motion.

10. In picking mechanism for a loom shuttle, hollow means providing a firing chamber containing a nongaseous compressible firing medium under a given superatmospheric pressure and providing also a tripping chamber containing a nongaseous compressible tripping medium at a pressure less than said given pressure, a shuttle picking actuator extending through said chambers having an area of given size transverse of the axis thereof contacting the tripping medium and having also an area transverse of the axis thereof of less size than said given size in the firing chamber contacting the firing medium and cooperating with said firing medium to hold the actuator in a firing position which separates the tripping medium from the firing medium, and means to connect the firing medium to the tripping medium to increase the pressure of the latter medium to enable the tripping me-

dium in cooperation with said area of given size to move the latter to a position to be acted upon by the firing medium, whereupon the latter causes a shuttle picking stroke of the actuator.

11. In picking mechanism for a loom shuttle, hollow means providing a firing chamber containing a non-gaseous compressible firing medium under superatmospheric pressures and providing also a tripping chamber containing a nongaseous compressible tripping medium at a pressure different from said superatmospheric pressure, a shuttle picking actuator extending through said chambers having an area of given size transverse of the axis thereof contacting the tripping medium and having also an area transverse of the axis thereof of less size than said given size in the firing chamber contacting the firing medium, said superatmospheric pressure and said area of less size exerting on said actuator a greater force than said different pressure and area of given size exerts on said actuator to hold the actuator in a firing position which separates the tripping medium from the firing medium, and means to increase said different pressure to enable the latter when increased to cooperate with said given area to move the area of given size to a position to be acted upon by the firing medium, whereupon the latter causes a shuttle picking stroke of the actuator.

12. In picking mechanism for a loom shuttle, hollow means providing a firing chamber containing a non-gaseous compressible firing medium and providing also a tripping chamber containing a nongaseous compressible tripping medium, a shuttle picking actuator extending through said chambers having an area of given size transverse of the axis thereof contacting the tripping medium and having also an area transverse of the axis thereof of less size than said given size in the firing chamber contacting the firing medium, means to create different pressures in said media of the firing and tripping chambers such that the pressure in the firing chamber holds the actuator in a firing position which separates the tripping medium from the firing medium, and means to increase the pressure in the tripping chamber to enable the medium therein to move the area of said given size to a position to be acted upon by the firing medium, whereupon the latter causes a shuttle picking stroke of the actuator.

13. The method of effecting the picking stroke of a shuttle actuating plunger which passes through aligned firing and tripping chambers filled with a nongaseous compressible medium, and wherein a cam has an inclined area and a dwell area for engagement with compressing means, said method consisting in the following steps: positioning the plunger to separate the media in the firing

and tripping chambers, compressing the medium in the firing chamber by a force exerted by the inclined area on said compressing means without compressing the medium in the tripping chamber, and thereafter manually turning the cam while the dwell area thereof engages the compressing means to effect connection of the medium in the tripping chamber with the medium in the firing chamber.

14. The method of effecting the picking stroke of a shuttle actuating plunger which passes through aligned firing and tripping chambers filled with a nongaseous compressible medium, and wherein a valve connects the chambers and a cam has an inclined area and dwell area for engagement with compressing means, said method consisting in the following steps: positioning the plunger to separate the media in the firing and tripping chambers, compressing the medium in the firing chamber by a force exerted by the inclined area on said compressing means without compressing the medium in the tripping chamber, and thereafter manually turning the cam while the dwell area thereof engages the compressing means to effect turning of the valve to connect the medium in the tripping chamber with the medium in the firing chamber.

15. In means for effecting the picking stroke of a shuttle in a loom, means providing aligned firing and tripping chambers filled with a nongaseous compressible medium, an actuating plunger for the shuttle passing through said chambers, compressing means for the media in said chambers, a cam having an inclined area and a dwell area for engagement with said compressing means, means to locate the plunger in position to separate the media in the firing and tripping chambers, the inclined area of the cam effective to cause the compressing means to compress the medium in the firing chamber without compressing the medium in the tripping chamber, and manually operable means to turn the cam while the dwell area thereof engages the compressing means to effect connection of the medium in the tripping chamber with the medium in the firing chamber.

16. The means set forth in claim 15 wherein the connection of the media in the chambers is effected by a rotary valve and the manually operable means when actuated causes turning of the valve while the dwell area of the cam engages the compressing means.

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