L. H. LANDRY.

LOOM.

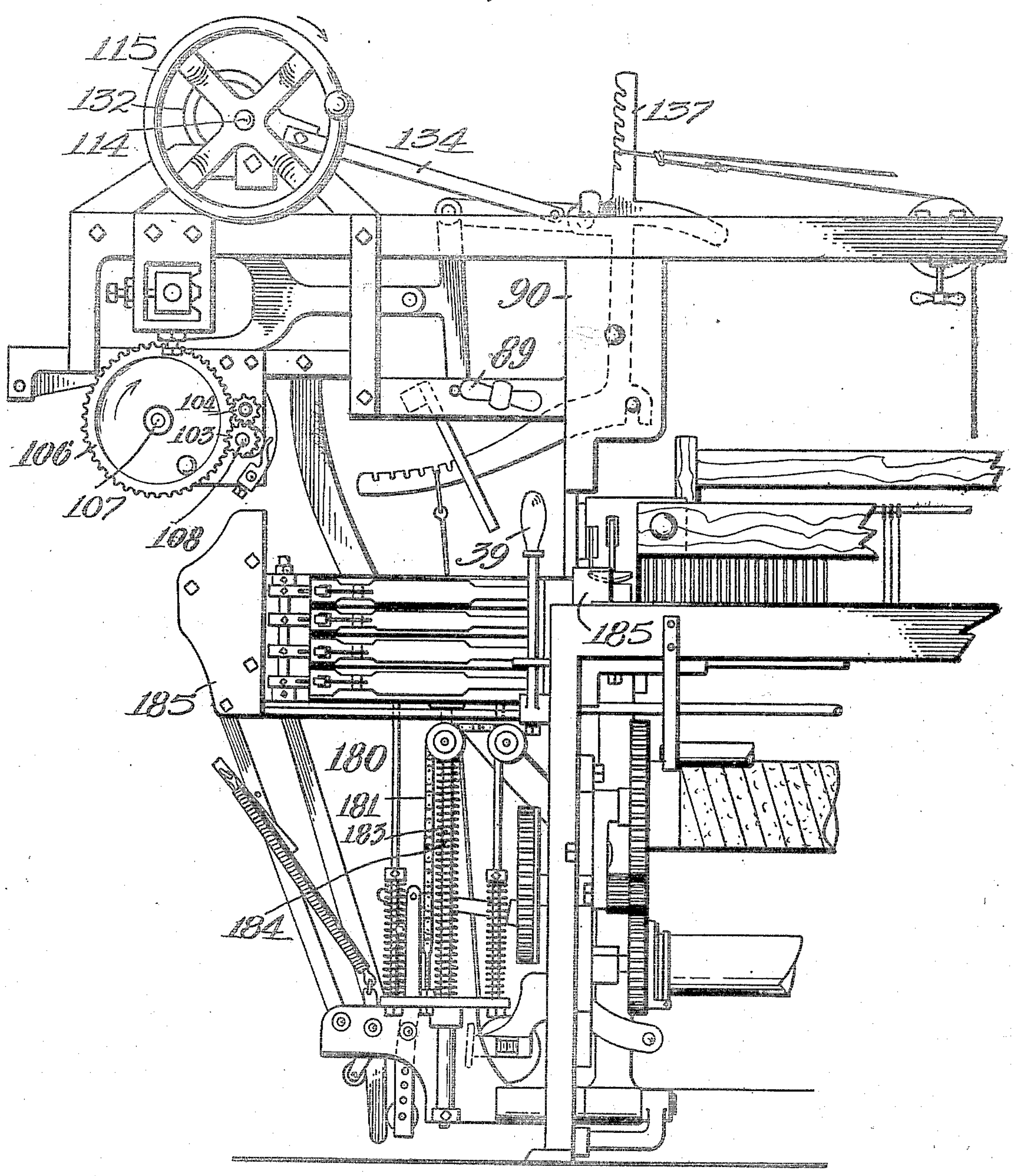
APPLICATION FILED AUG. 18, 1909.

1,071,245.

Patented Aug. 26, 1913.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

M. E. Regan.

C. F. Hasson

Inventor

L. H. Landry.

by attorneys

Southgate & Southgate.

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3 SHEETS—SHEET 2.

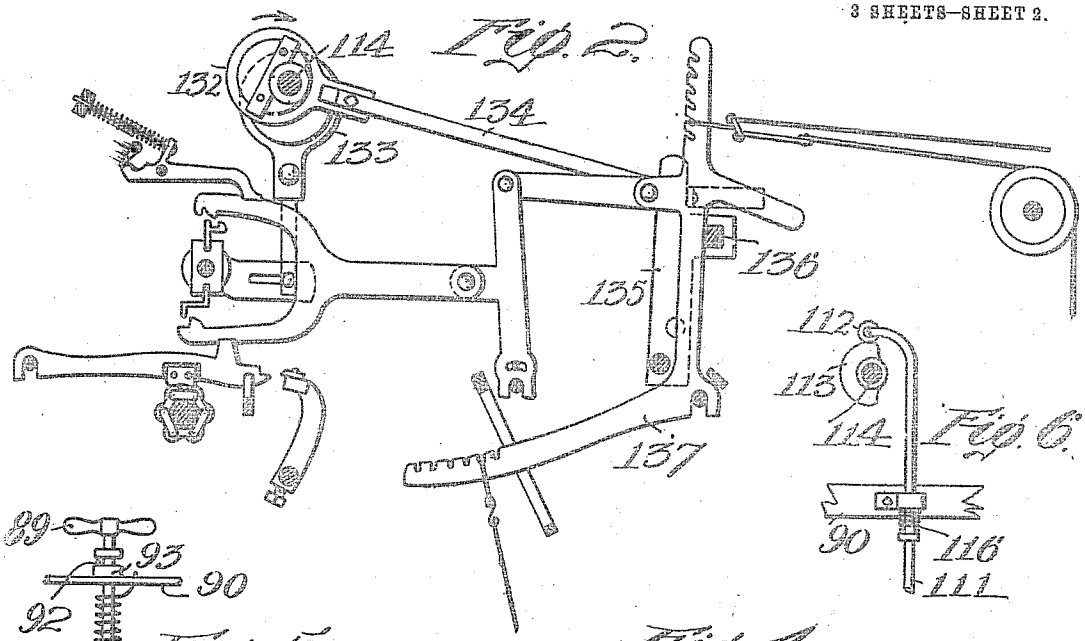

Fig. 2.

Fig. 6.

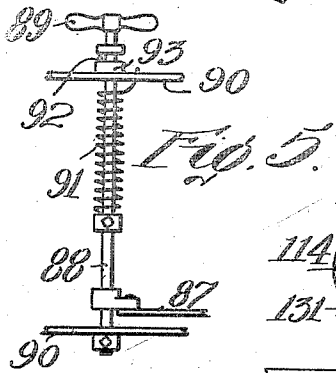

Fig. 5.

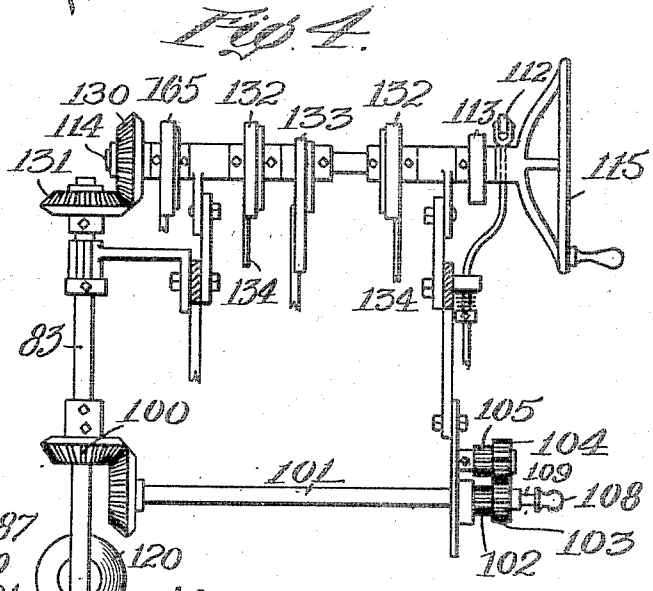

Fig. 4.

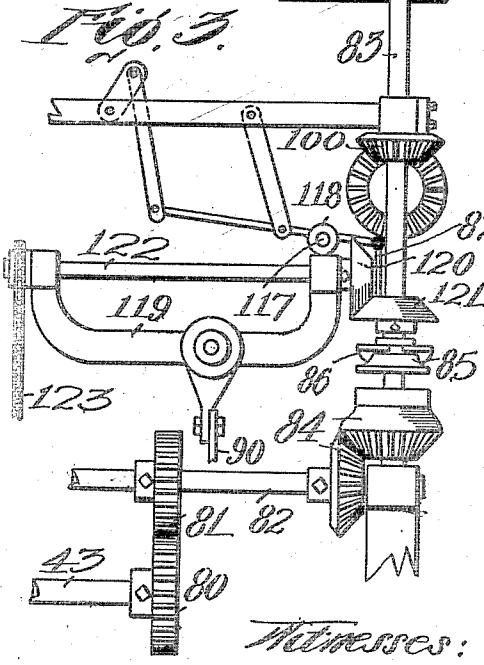

Fig. 3.

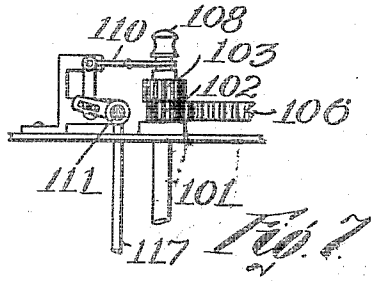

Fig. 7.

Witnesses:

M. E. Regan.

E. F. Mason

Inventor

L. H. Landry

By Attorneys

Southgate & Southgate

L. H. LANDRY.

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3 SHEETS—SHEET 3.

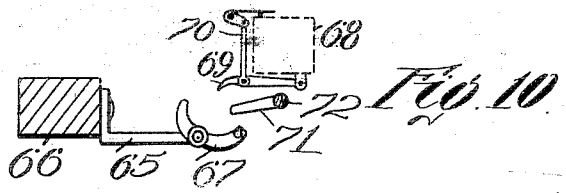

Fig. 10.

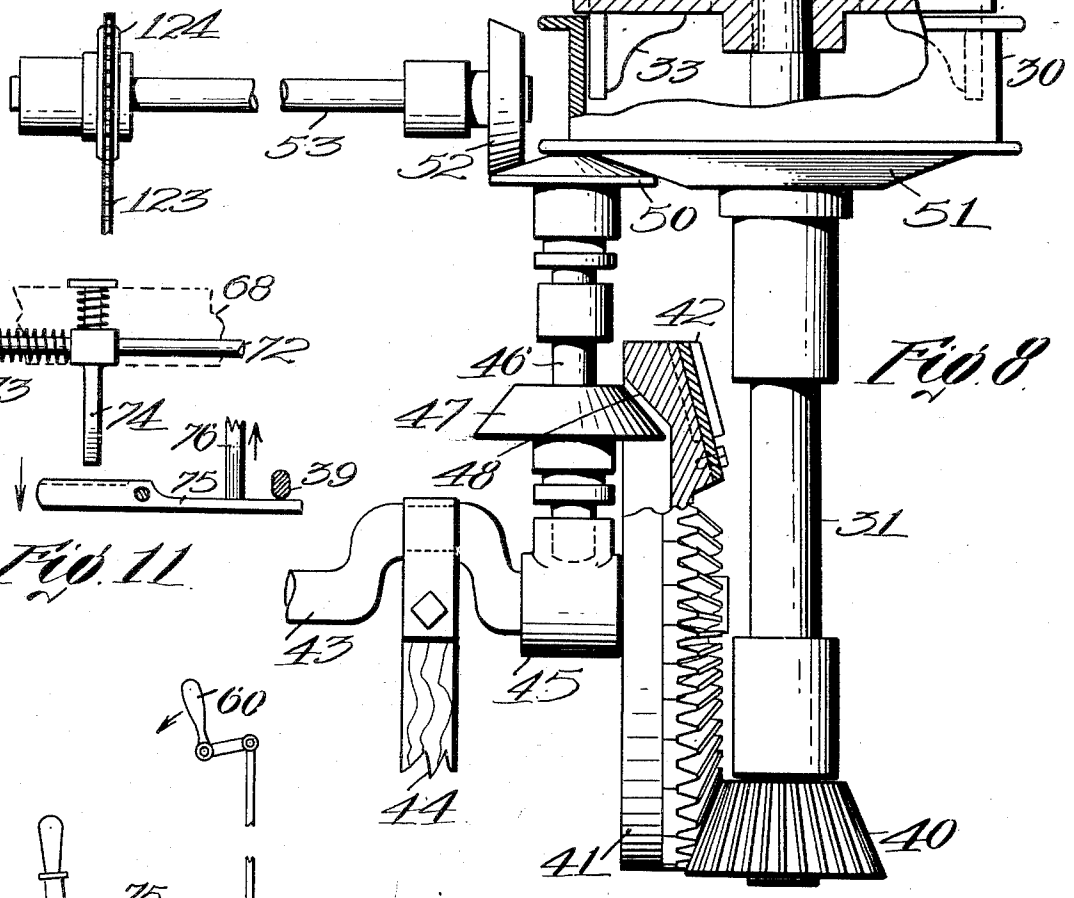

Fig. 8.

Fig. 11.

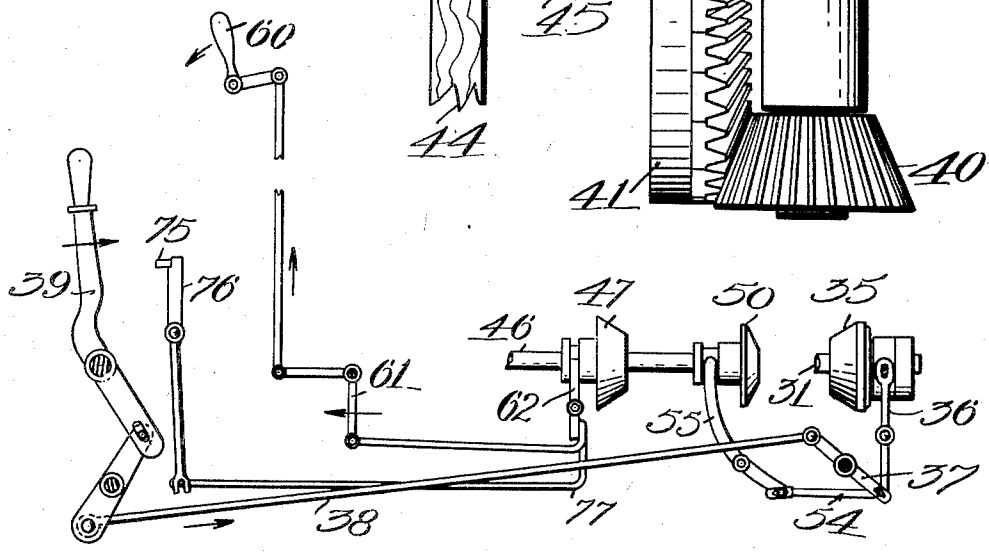

Fig. 9.

Witnesses:

M. E. Regan.

C. F. Wesson

Inventor

L. H. Landry

By Attorneys

Southgate & Southgate.

UNITED STATES PATENT OFFICE.

LOUIS H. LANDRY, OF UXBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-EIGHTH TO UDGIL LAROCQUE AND ONE-HALF TO SAMUEL B. TAFT, BOTH OF UXBRIDGE, MASSACHUSETTS, AND ONE-EIGHTH TO LOUIS BOUSQUET AND THEODORE BOUSQUET, BOTH OF BURRILLVILLE, RHODE ISLAND.

LOOM.

1,071,245. Specification of Letters Patent. Patented Aug. 26, 1913.

Original application filed July 24, 1908, Serial No. 445,155. Divided and this application filed August 18, 1909. Serial No. 513,494.

To all whom it may concern:

Be it known that I, LOUIS H. LANDRY, a citizen of the United States, residing at Uxbridge, in the county of Worcester and State of Massachusetts, have invented a new and useful Loom, of which the following is a specification.

This invention relates to a loom suitable for weaving all kinds of fabrics and this case is a division of my Patent No. 943,028 granted on the 14th day of December 1909, on an application filed July 24, 1908, Serial No. 445,155.

The principal objects of this invention are to provide improvements of such a character that the construction of the loom will be greatly simplified and the expense of manufacturing correspondingly decreased; that the repairs will be materially lessened so that a loom fixer can keep a larger number of looms in repair; that the loom will be capable of operating at a higher speed; that there will be fewer occasions on which the loom will be stopped and the duration of stopping will be shorter so that the production will be increased in these ways in addition to the increase due to the higher speed; and that in the simpler types of looms an attendant can operate a larger number.

This invention also comprises improved driving connections whereby the driving motion can be connected up with the rest of the machine in such a way that when the starting lever is pushed to stop the loom it connects a friction shaft with the loose pulley so that the operator can use this shaft to help reverse the head motion in picking out. These parts are so arranged that when the starting lever is operated to start the machine, the above mentioned friction shaft is disconnected from the driving mechanism. Means is provided whereby if the filling in the shuttle should break when the loom is running, the loom will bunt or stop on that pick, and when it stops it connects the friction shaft above mentioned in such a way as to pull the lay back to its dead center, so that all the weaver has to do is to pull out the broken pick, throw a shuttle back through the shed, and the machine is then ready to start up without losing time, no manipulation of the head motion being required. On the other hand if the operator stops the loom with the lay up to the cloth and wishes to reverse to dead center, he does not have to push the lay back against the resistance as is ordinarily the case, but he can operate a finger or lever above the harness which will connect the lay with the friction shaft so as to reverse it to the dead center.

Further objects of the invention are to provide efficient means whereby the independent operation of several of the parts of the loom will be facilitated, and for this purpose the driving shaft has a loose pulley or the like whereby the lathe, head-motion, pick-out motion and box motion can be operated independently of the driving shaft. In order further to carry out this idea, a crank shaft, an auxiliary shaft and an intermediate shaft are provided, the intermediate shaft having means for connecting the loose pulley with the auxiliary shaft and for causing the intermediate shaft to be rotated by the loose pulley, and the intermediate shaft being provided with independent operating means for connecting it with the crank shaft so that either the auxiliary shaft or crank shaft, or both, can be operated from the loose pulley independently of the driving shaft. The head-motion preferably is operated from the crank shaft but means is provided whereby it can be operated by the auxiliary shaft when the latter is connected with the loose pulley, and the auxiliary and crank shafts can be driven independently of each other from the pulley.

Reference is to be had to the accompanying drawings, which show one form of the invention as applied to a broad heavy worsted loom, and in which—

Figure 1 is a front elevation, one end of the same showing the head-motion and certain other features. Fig. 2 is a front elevation of a portion of the head motion with the frame shown in Fig. 1 removed. Fig. 3 is a rear elevation of a part of the pick-out motion and driving connections therefor and

for the head motion. Fig. 4 is a view from the end of the loom showing part of the pick-out motion and driving connections for the head motion. Fig. 5 is a plan of a hand-operated clutch and connected mechanism. Fig. 6 is a front elevation of a cam and connected mechanism constituting part of the pick-out motion. Fig. 7 is a fragmentary plan showing connections for throwing the pick-out motion into and out of operation. Fig. 8 is a plan of the driving mechanism partly in section. Fig. 9 is an elevation thereof partly diagrammatic showing the connection of the shipper stop motion and the like with the driving mechanism. Fig. 10 is a plan showing a portion of the stop motion, and Fig. 11 is an end elevation showing the rest of the stop motion.

The loom is designed to operate without a so-called tight pulley, the power being applied through a loose pulley 30 which receives the driving belt and which is mounted to freely rotate on the driving shaft 31. The power is transmitted directly to this driving shaft from this loose pulley by means of a clutch which consists of a slotted disk 32 keyed to the shaft and having radially sliding dogs 33 extending through the slots into the loose pulley and adapted to be forced against the walls thereof by means of a double wedge block 35 which acts directly on the dogs to clutch the pulley and operates levers 34 for withdrawing the dogs inwardly when the wedge block moves back. The wedge block is operated by a lever 36 or the like. This lever is shown as designed to be operated by a swinging lever 37, link rods 38, and shipper handle 39 or in any other convenient manner. On the driving shaft is mounted a bevel pinion 40 which preferably is driven on to a tapered square end on the shaft so that it will not work loose in operation. This pinion meshes with the driving gear 41 which preferably has removable teeth 42. These teeth are shown as made in pairs and bolted or otherwise secured removably to the base of the gear so that if one or more of them break they can readily be replaced by new ones without dismounting or replacing the whole gear. This driving gear is mounted on the crank shaft 43 which operates the machine and which has links 44 connected with the lathe for moving it in the usual way. A bearing 45 for the crank shaft is provided with an end bearing for a friction shaft 46. This friction shaft is provided with a bevel friction disk 47 slidingly keyed thereon and adapted when pushed backward on the shaft 46 to engage a corresponding friction surface 48 on the rear of the main friction gear. The shaft is provided also with a second bevel friction wheel 50 fixed thereon and meshing with a friction surface 51 on the loose pulley and with a friction wheel 52 on a shaft 53. When the lever 39 is thrown to force out the wedge 35 to stop the machine it also acts through a link 54 and lever 55 to throw the friction wheel 50 into engagement with the friction surface 51 and wheel 52 which will cause the shafts 46 and 53 to rotate while the driving shaft is at rest. If while the machine is stopped it is desired to turn the crank shaft, it is necessary only to turn a small lever or finger 60, which operates through link connections 61 to turn a lever 62 and push the friction wheel 47 into engagement with the friction surface 48 so that although the loose pulley is not operating the driving shaft, this shaft can be turned by the loose pulley through the shaft 46. If upon stopping the machine, the lathe is found to be forward, the lever 60 is pushed down long enough to cause the lathe to be swung back. This occupies only an instant of time and is of great assistance to the operator as in the heavier types of looms it requires considerable force to push the lathe back.

This invention is shown in connection with an improved stop motion which acts in such a way that the loom will stop with the lathe back. This stop motion is shown as comprising a bracket 65 on the breast-beam 66 and a stop motion rocker 67 on the bracket. On the lathe 68 is pivoted a tongue 69 normally held up by the filling thread through connections 70. When the filling thread breaks these connections and tongue are permitted to drop so that the tongue engages the upper end of the rocker 67 during the next forward motion of the lathe which operates the lower end to engage an arm 71 on a rock shaft 72. This rock shaft is provided with a spring 73 for holding it in proper position and a dagger 74 which is turned by the above mentioned operation in position to engage a lever 75 which operates the shipper handle 39 and also operates a lever 76 which has connections 77 for operating the lever 62 in a manner which has been described above so as to cause the friction to work and the lathe to beat back. When the lathe starts back there is no longer any force acting to hold the wheel 47 against the friction surface 48. Consequently the lathe will stop at the end of the back stroke.

Near the end of the machine the crank-shaft 43 has a gear 80 meshing with a gear 81 on a head motion driving shaft 82. This shaft drives an upright shaft 83 through bevel gears 84. One of the gears 84 runs loose on the shaft 83 and is connected therewith by a clutch 85 which is operated by a yoke 86 and a lever 87 adapted to be controlled by a shaft 88 having a handle 89 on the outside of the frame 90 of the machine. A spring 91 normally tends to hold the shaft 88 in such position that a pin 92

thereof will be in a corresponding depression in a collar 93 on the shaft so that the handle will turn the shaft. Of course this pin connection or clutch on the handle 89 can be readily disengaged by pulling the handle out and turning it slightly.

The shaft 83 is provided with a bevel gear 100 which drives a shaft 101 carrying a pair of gears 102 and 103. Located on a stud near these gears are a pair of gears 104 and 105. The gears 103 and 104 are constantly in mesh with each other. The gears 102 and 105 are constantly in mesh with a gear 106 on the chain cylinder shaft 107. On the end of the shaft 101 is a stud 108 having a key 109 for fixing either of the gears 102 or 103 with respect to the shaft 101. When the stud is pushed in the gear 102 is fixed to the shaft and it is loose when the stud is pulled out. The gear 103 is tight when 102 is loose and vice versa, but when the key is half way out both gears are loose which permits the wheel 106 to be operated by hand. This is brought about by having annular grooves in the adjacent edges of the gears which together are wide enough to receive the key. Any device for connecting one of a pair of loose gears to a shaft may be employed in place of this construction. When the stud is pushed in the gear 106 will be driven directly from the shaft 101 through the gear 102 and when it is pulled out it will be driven indirectly in a reverse direction through the gears 103, 104 and 105. The pulling out of the stud 108 also has another result; that is, it swings a lever 110 which rocks a shaft 111 and turns a roller 112 thereon in position to be engaged by a cam 113 on a shaft 114 which can be operated manually by a hand wheel 115 to control the pick-out motion.

The spring 116 is shown for pulling the rod 111 and roller 112 down. The bottom of the rod 111 is connected with a lever 117 so that when the cam 113 pulls up the rod 111 during a half revolution the opposite end of the lever 117 will be depressed so as to act on an eye 118 and swing down a frame 119 which is pivoted on the frame 90 of the machine until a bevel friction wheel 120 thereon engages with a wheel 121 fixed to the shaft 83. This causes a shaft 122 on which the wheel 120 is mounted to drive the shaft 83. The shaft 122 is driven through a sprocket chain 123 which is connected with a sprocket wheel 124 on the shaft 53. It will be seen, therefore, that by pulling out the stud 108 when the machine is stopped, the shaft 107 will be reversed which will reverse the operation of the harnesses as will be described hereinafter and then if the hand-wheel 115 is rotated by hand the rotation of shaft 114 will be assisted by the power derived from the shaft 122 during a half revolution and will not be assisted during the other half. The lever 110 can be swung out from the stud 108 if desired so that the motion can be reversed by that stud without throwing the power on the shaft 83 from the shaft 53. The results to be obtained by these operations will now be described.

The shaft 114 which has been referred to is provided with bevel gear 130 deriving power, when the machine is running, from a gear 131 on the shaft 83. This shaft 114 in addition to the cam 113 is provided with eccentrics 132 and 133 for opening and closing the shed, respectively. Two eccentrics 132 are shown which are provided with rods 134 connected with a pivoted frame 135 which has a cross-bar 136 adapted to engage the several jacks 137 to pull them up into position to close the shed, preferably as indicated in my above mentioned patent or in any described way. During the operation of the machine from the main crank-shaft 43, the shed will be opened and closed periodically in a very simple manner without employing the usual vibrator gears and when the power is shut off from the main crank shaft 43 the auxiliary shaft 53 will still be turning and consequently when the clutch 86 is thrown in, the head motion shaft 83, the eccentric shaft 114, and the shaft 101 can be operated by power simply by throwing in the clutch handle 89. Moreover, by manipulating the stud 108 and turning the hand-wheel 115 the power can be employed while the machine is not operating to turn the pick-out through half a revolution while during the other half of the revolution it has to be turned by hand. This pick-out motion is an important feature because by the automatic operation of the cam 113 the operator can turn the hand wheel 115 and have the power help him operate the harnesses during the part of the revolution when there is the greatest resistance and yet the power will be automatically thrown out when that part of the revolution is completed and the operator can tell by the pull of the hand-wheel when the shed has been closed so that the thread can be passed through and the machine started. Or if he has reversed the drive through the gear 106 and wishes to go back two or three picks, he can do this very readily with no danger of the power carrying the mechanism back too far. The box motion indicated in a general way by 180, is also driven from the eccentric shaft 114 through an eccentric 165 which, by means of connections (not shown) operates chains 181, as indicated in my above mentioned patent or in any other described way. This mechanism is shown in connection with a box rod 183 and spring 184 for controlling and guiding shuttle boxes in the box guides 185. Dur-

ing the operation of the machine from the main crank shaft 43, the box motion will operate regularly, and when the power is shut off from the main crank shaft 43, the auxiliary shaft 53 will still be turning and consequently when the clutch 86 is thrown in, the shafts 83 and 114, with the box motion, can be operated by power simply by throwing in the clutch handle 89.

From the description which has been given, it will be seen that the above mentioned advantages can be secured in a very simple manner, and can be applied to practically all types of looms.

While I have illustrated and described a preferred embodiment of the invention and shown it as applied to a particular type of looms, I am aware that it can be carried out in many other ways, and applied to other types of looms without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction shown, but

What I do claim is:—

1. In a loom, the combination of a driving shaft, a lathe, means for operating the lathe, a head motion, and means comprising a power-operated member mounted on the driving shaft for operating the lathe and head motion independently of the driving shaft.

2. In a loom, the combination of a driving shaft, a loose pulley thereon, a lathe, a head motion, and means for operating the lathe and head motion from said loose pulley independently of the driving shaft.

3. In a loom, the combination of a driving shaft, a loose pulley thereon, means for fixing the loose pulley to the driving shaft, a crank shaft, an auxiliary shaft, means for operating the head motion from the crank shaft, means for connecting the head motion with the auxiliary shaft, for connecting the loose pulley with the auxiliary shaft, and for causing the auxiliary shaft to be rotated by the loose pulley, and independent means for connecting the auxiliary shaft with the driving shaft.

4. In a loom, the combination of a driving shaft, a loose pulley, means for fixing the loose pulley to drive the driving shaft, a crank shaft, an auxiliary shaft, a head motion, means for driving the head motion from the crank shaft, means for driving the head motion independently of the crank shaft from the auxiliary shaft, and means for driving the auxiliary shaft and crank shaft independently of each other from the pulley.

5. In a loom, the combination of a crank shaft, a head motion shaft, a head motion, a box motion, means for driving each of said motions from the crank shaft, and independent means for driving each of said motions from the head motion shaft operatively in the same direction.

6. In a loom, the combination of a driving shaft, a crank shaft, a head motion, a pick-out motion, means for driving the head motion and pick-out motion from the crank shaft, and means for driving the head motion and pick-out motion independently of the crank shaft operatively in the same direction.

7. In a loom, the combination of a driving shaft, a loose pulley therefor, means for fixing the loose pulley to the driving shaft, a crank shaft, a head motion, a pick-out motion, means for driving the head motion and pick-out motion from the crank shaft, and means for driving the head motion and pick-out motion independently of the crank shaft.

8. In a loom, the combination of a crank shaft, a head motion shaft, a head motion, a pick-out motion, a box motion, means for driving each of said motions from the crank shaft, and independent means for driving each of said motions from the head motion shaft.

9. In a loom, the combination of a crank shaft, an auxiliary shaft, a head motion, a pick-out motion, a box motion, means for driving each of said motions from the crank shaft, and independent means for driving each of said motions from the auxiliary shaft, a driving wheel, means for driving the crank shaft from the driving shaft, and means for driving the auxiliary shaft from the driving wheel when the crank shaft is disconnected therefrom.

10. In a loom, the combination of a crank shaft, an auxiliary shaft, a pick-out motion, a box motion, means for driving each of said motions from the crank-shaft, independent means for driving each of said motions from the auxiliary shaft, a driving wheel, means for driving the crank shaft from the driving shaft, means for driving the auxiliary shaft from the driving wheel when the crank shaft is disconnected therefrom.

11. In a loom, the combination of a crank-shaft, an auxiliary shaft, a pick-out motion, a box motion, means for driving each of said motions from the crank-shaft, and independent means for driving each of said motions from the auxiliary shaft.

12. In a loom, the combination of a crank-shaft, a box motion adapted to be operated thereby, an auxiliary shaft, means for operating the auxiliary shaft independently of the crank shaft, and means for operating the box motion from the auxiliary shaft.

13. In a loom, the combination of a crank shaft for operating the lathe, a head motion located at the head end of the loom, a clutch for connecting the head motion with the crank shaft, an auxiliary shaft, means

for operating the auxiliary shaft independently of the crank shaft, and a friction drive for connecting the auxiliary shaft with the head motion shaft, whereby it may be operated either by the crank shaft or the auxiliary shaft.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

LOUIS H. LANDRY.

Witnesses:
ALBERT E. FAY,
C. FORREST WESSON.