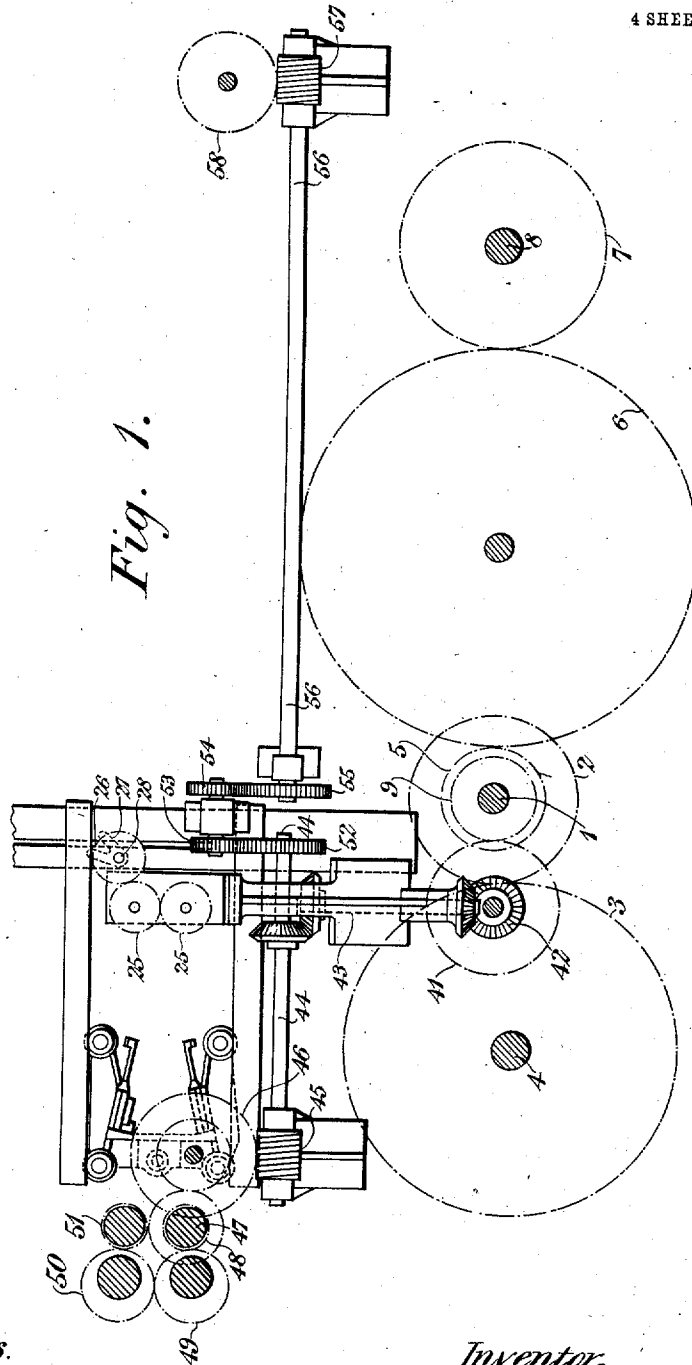


W. H. FORTY.
 LOOM FOR WEAVING COIR MATS AND THE LIKE.
 APPLICATION FILED JULY 25, 1910.

1,019,625.

Patented Mar. 5, 1912.

4 SHEETS—SHEET 1.



Witnesses.
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4 SHEETS—SHEET 2.

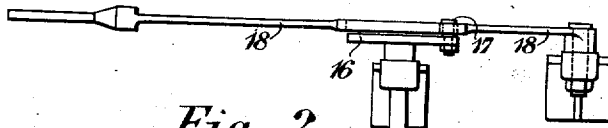


Fig. 2.

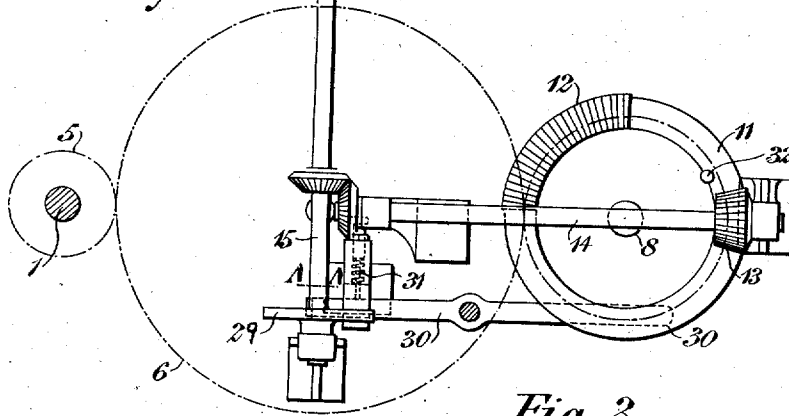
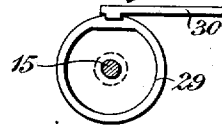


Fig. 3.



Witnesses.

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Fig. 5.

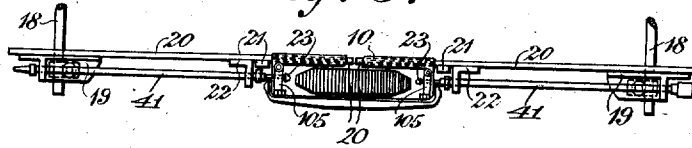
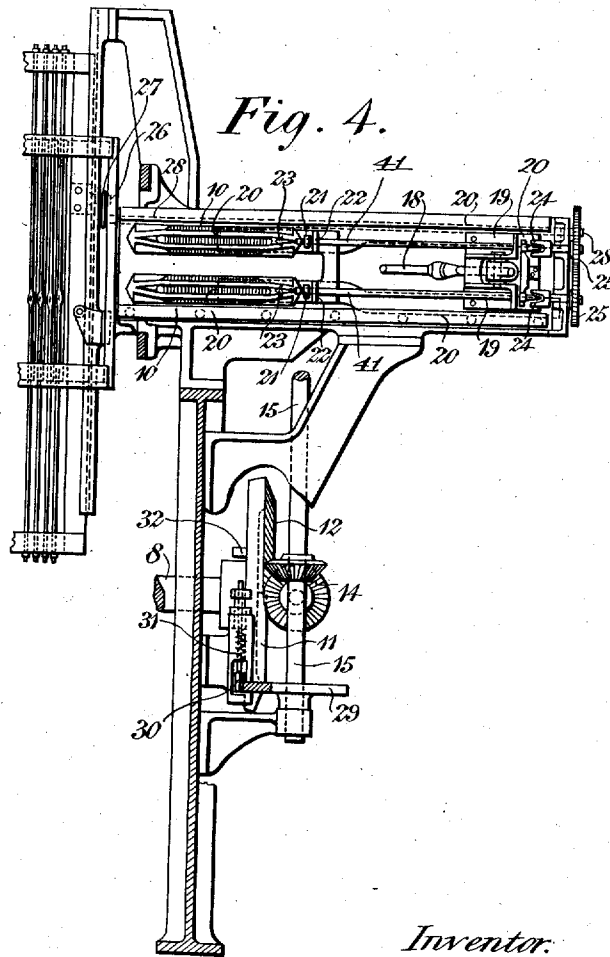


Fig. 4.



Witnesses.

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 W. E. Bunnell

Inventor.

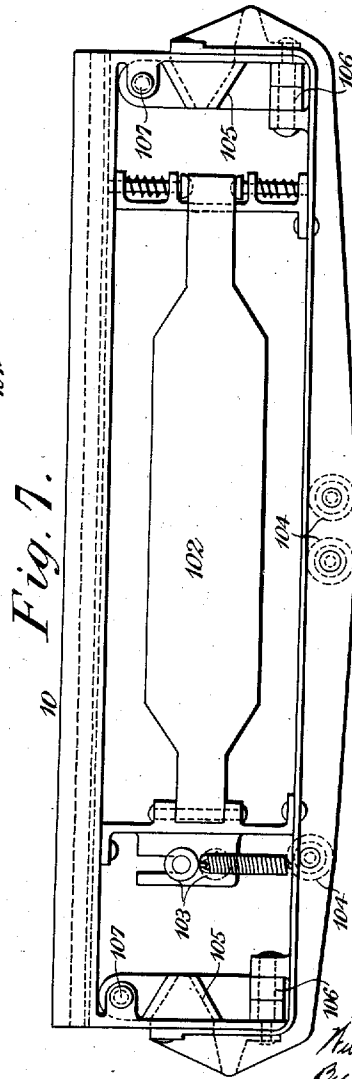
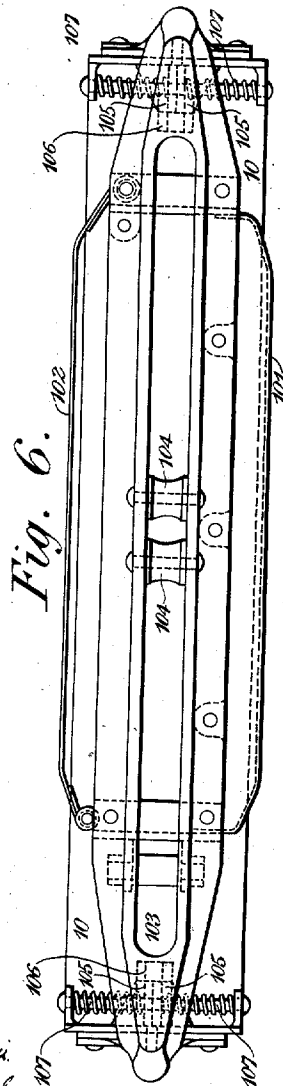
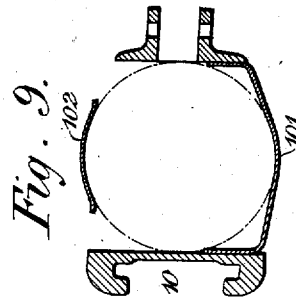
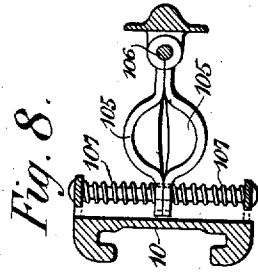
William H. Forty
 by his Attorneys,
 Baldwin Wright

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Patented Mar. 5, 1912.

4 SHEETS—SHEET 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

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LOOM FOR WEAVING COIR MATS AND THE LIKE.

1,019,625.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed July 25, 1910. Serial No. 573,786.

To all whom it may concern:

Be it known that I, WILLIAM HENRY FORTY, a subject of the King of Great Britain, residing at Upper Highway, Kings Langley, in the county of Hertford, England, have invented new and useful Improvements in Looms for Weaving Coir Mats and the Like, of which the following is a specification.

These improvements relate to positive shuttle motions and are designed more especially for use in looms for weaving mats face to face as double pile fabrics as described in the specification of a prior United States Patent No. 728,158.

The coir yarns used in the manufacture of mats being of a stiff unyielding nature special means have to be provided for keeping the wefts tightly strained.

The improvements are shown in the drawings annexed.

Figure 1 is a side elevation of some of the parts of a loom for weaving mats face to face as double pile fabrics. Fig. 2 is a side elevation of some of the parts for operating the shuttles. Fig. 3 a section on the line A—A, Fig. 2. Fig. 4 is a section and Fig. 5 a plan showing the means used for giving motion to the shuttles. Figs. 6, 7, 8 and 9 show separate views of the shuttle itself to an enlarged scale.

In the loom described in the former patent above referred to, the back of each shuttle had a dovetail projection upon it which as the shuttle was passed across the loom slid in corresponding notches in the face of the blades of the reed or slay and the shuttle was thereby supported as it was moved across the loom. These notches are now done away with and the shuttles are carried to and fro across the loom quite independently of the reed or slay while at the same time provision is made for insuring that the weft shall be kept tightly stretched after each traverse of the shuttle until it has been beaten up and the warps again crossed.

Two transverse horizontal slides are provided at the two sides of the loom. Each slide has fast with it two horizontal bars projecting from it toward the center of the loom one for carrying one shuttle the other for carrying the other. Normally each shuttle is supported by being slid for half its length on to the end of one of the bars at one side of the loom. When the

shuttle is to be passed across the loom the slides at the two sides of the loom are moved toward one another until the ends of the bars fast with one slide come against the ends of the bars fast with the other and half the length of each shuttle is then upon the ends of two bars. As the shuttle carried at the end of one bar is pushed onto the end of another bar it becomes locked to this latter bar and is carried by it to the opposite side of the loom when the bars are moved back to their former positions. The parts by which the slides are operated are then locked and absolutely restrained from all movement by a catch which then comes into action so that the weft is securely held under tension.

In Fig. 1, 1 is the driving shaft having upon it a toothed wheel 2 driving at half its speed a toothed wheel 3 on a cam shaft 4. The driving shaft also has upon it a toothed wheel 5 which through a toothed wheel 6 drives a toothed wheel 7 on a cam shaft 8 also at half the speed of the driving shaft. From another toothed wheel 9 on the driving shaft motion is given to the warp let off mechanism and the mechanism for taking up the woven fabric as hereinafter explained.

The manner in which the shuttles 10 have motion given to them from the cam shaft 8 is shown separately in Figs. 2, 3, 4 and 5.

The cam shaft 8 extends across from one side of the loom to the other and at each of its ends has fast upon it a wheel 11 on the outer face of which is a toothed segment 12 which at each revolution of the shaft engages with the teeth of a pinion 13 and causes it to make one complete revolution. The pinion 13 is fast on a shaft 14 which by bevel wheel gears drives a vertical shaft 15 the upper end of which has fast with it a disk 16 which has a crank pin 17 extending up from it. This crank pin transmits a to and fro rocking movement to a horizontal rocking lever 18 one end of which turns on a fixed fulcrum the other engages with a swivel joint on a slide 19 (see Figs. 4 and 5) which can be slid to and fro transversely of the loom in fixed guides secured to the framing of the loom. The slide 19 has projecting inward from it toward the center of the loom two bars 20 one for each shuttle.

When the slides 19 at the two sides of the loom are moved inward toward one another, the ends of the bars 20 projecting from one

slide approximately meet the ends of the bars 20 which project from the other slide as indicated in the plan view Fig. 5. The back of each shuttle 10 is so formed that it can slide to and fro along the ends of the bars 20. The shuttle itself is as shown in Fig. 9 formed to hold a cop of yarn. The cop when in the shuttle rests on its bottom plate 101 and is prevented from rising by a lid 102 which can be turned up on a hinge joint at one end when a new cop is to be inserted. The thread passes from the interior of the cop between friction rollers 103 and then over guide rollers 104. When the bars 20 which project from the slides 19 at the two sides of the loom are made to meet approximately at the center of the loom each shuttle will have half its length slid onto the end of one bar and the other half of its length onto the end of the other bar. When the slides 19 are moved away from one another and brought back to the sides of the loom each shuttle which previously had been carried upon one bar 20 from one side of the loom toward the center will be retained on the other bar and will be carried along with it and so be made to complete its travel across the loom.

When one end of a shuttle has been slid onto the end of a bar 20 the end of the shuttle rests against an elastic buffer 21 interposed between it and a bracket 22 which projects from the bar. When the bar is moved inward toward the center of the loom the buffer pushes the shuttle forward along with it.

The locking of the shuttle to the one slide 19 or to the other is effected in the following manner. Parallel with each bar 20 is a stem or rod 41 having a hook 23 on its inner end.

The hook passes between two blades 105 hinged at 106 to the ends of the shuttle and pressed toward one another by springs 107. The central portion of the outer side of each blade 105 is curved outward and these curved portions when the other parts of the blades are bearing against one another form a conical funnel mouth for the forward ends of the hooks to pass into. When the shuttle is slid onto the end of the bar 20 the hook passes between the two blades pressing them apart one from the other. If then the hooked end is at right angles to the blades the shuttle cannot be drawn off from the hook but if the hook is parallel with the blades the shuttle can be drawn off freely from it.

When a slide 19 is at one side of the loom the outer ends of the hook stems engage with sockets 24 which are on the inner ends of short spindles which are geared to one another by toothed wheels 25. A quarter turn can be given to these wheels to give a quarter turn to the hooks so as then to

turn the hooks into position either to lock the hooks to the shuttles or to turn them into positions in which the shuttles can be drawn off from them. This quarter turn can be given to the hooks at the proper time by a pin 26 projecting from one of the heddles which as the heddle is moved up or down strikes against one or other arm of a piece 27 fast on an axis 28 which at its outer end has upon it a pinion which gears with one of the toothed wheels 25.

If a shuttle has been drawn to one side of the loom by one hook, the hook has a quarter turn given to it while the shuttle is at rest at that side of the loom so that when the shuttle is again moved toward the center of the loom the hook is in such a position that the shuttle can be drawn off from it while the hook on the opposite side of the loom is turned into such a position that when the end of the shuttle is pressed onto it, it will when drawn back draw back the shuttle along with it. Thus at each revolution of the vertical shafts 15 at the two sides of the loom the two slides 19 move toward one another and meet approximately at the center of the loom, and afterward the slides return to their original position.

The shuttles carried on the ends of the bars 20 which project from one slide are carried half way across the loom upon these bars and their forward ends made to slide onto the ends of the bars 20 of the other slide. The hooks 23 of this latter slide are so made to press aside and pass between the two spring blades at the forward end of the shuttle and being at right angles to these blades they draw the shuttle along with them as the two slides are drawn back away from one another and the shuttles are so made to complete their traverse across the loom and are for a time held fast by the hooks until the weft has been beaten up and until the heddles are operated to cause the warps which were up to be lowered and the warps which were down to be raised and then the hooks have a quarter turn given to them so that the hooks which were previously holding on to the shuttles are turned into positions in which the shuttles are free to be drawn off from them.

To lock the slides 19 whenever they come to rest at the end of their outward travel and so insure that the weft shall be kept tightly stretched each vertical shaft 15 has fast with it a disk 29 (see Figs. 2, 3 and 4) in the circumference of which is a notch into which a projection on a lever 30 enters when the notch comes below it and the end of the lever which has this projection formed upon it being pressed downward by a spring 31. When the vertical axis is thus locked the pinion 13 on the shaft 14 is locked also in such a position that when the toothed segment 12 again comes around to

gear with it the teeth of the segment shall mesh properly with the teeth of the pinion. Exactly at the time when the segment and pinion commence to gear with one another a pin 32 on the wheel 11 acting against the tail end of the lever 30 causes the projection on this lever to be lifted out of the notch in the disk 29 and so allows of the vertical shaft 15 being again caused to make one complete revolution.

What I claim is:—

The hereinbefore described combination of mechanism for passing a shuttle to and fro across a loom consisting of two horizontal slide ways in line with one another at opposite sides of the loom, slides 19 capable of being slid to and fro along the slide ways, bars 20 extending inward from the

slides which when the slides are moved inward toward one another meet approximately end to end, a shuttle 10 means for supporting the shuttle by one half of its length alternately first by the end of one of said bars 20 and then by the end of the other bar, a rod 41 extending along each bar 20, means for locking the inner end of the rod to or disengaging it from one end of the shuttle, and means for giving a partial turn to each rod just before the slides are to be moved inward toward one another to turn one into engaging and the other into disengaging positions.

WILLIAM HENRY FORTY.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."