

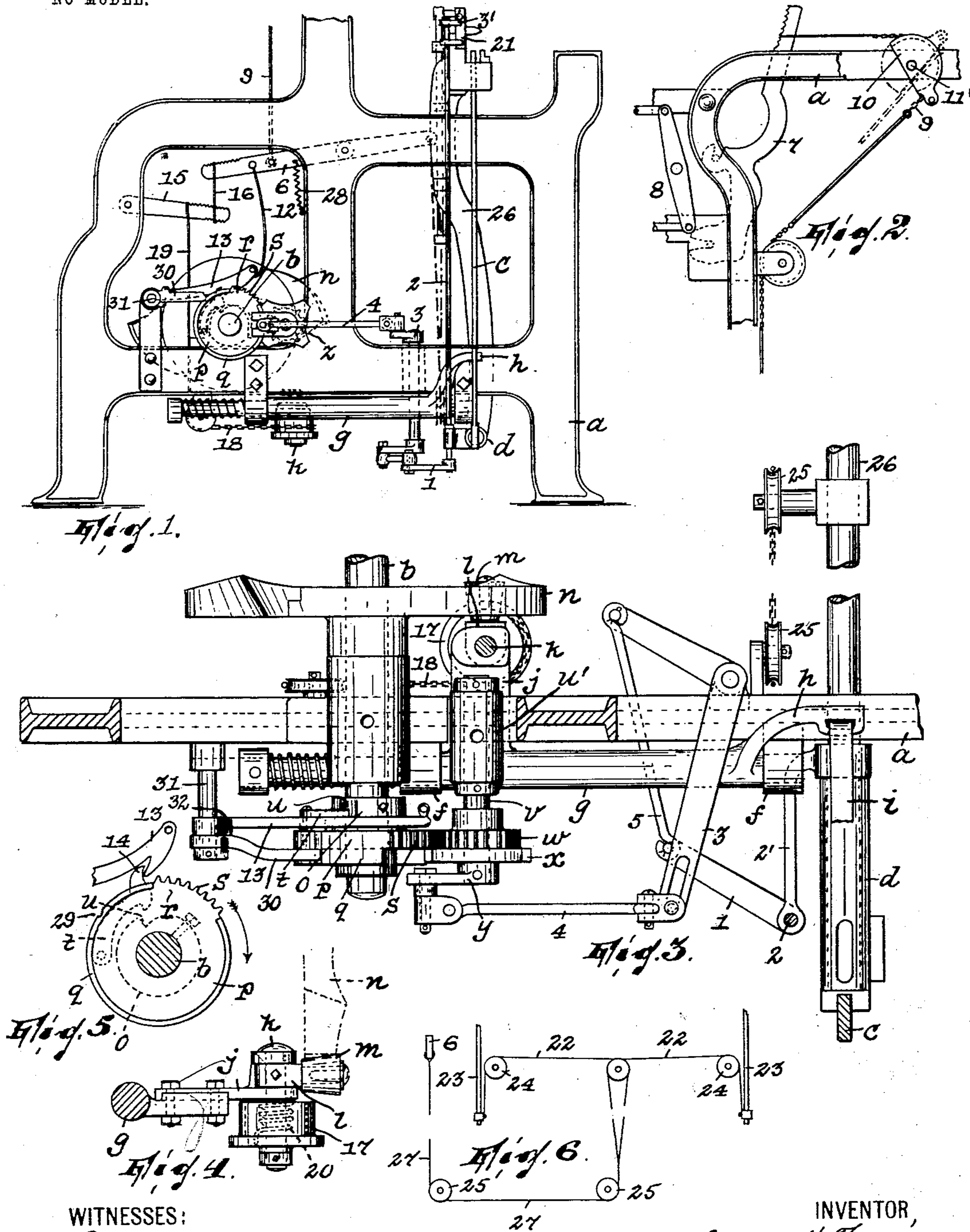
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J. H. FARRAR.
SWIVEL LOOM.

APPLICATION FILED OCT. 1, 1903.

NO MODEL.



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SWIVEL-LOOM.

SPECIFICATION forming part of Letters Patent No. 751,725, dated February 9, 1904.

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To all whom it may concern:

Be it known that I, JAMES H. FARRAR, a citizen of the United States, residing in Dundee Lake, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Swivel-Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to swivel-loom, and it has reference particularly to that part of the mechanism of such looms which comprises the means for driving the main or fly shuttle, the means for driving the swivel-shuttles, and the means for throwing the one of said driving means into and the other out of action, according as the one or the other is called.

The invention will be found fully illustrated in the accompanying drawings, wherein—

Figure 1 is a view in side elevation of a portion of a swivel-loom constructed in accordance with my invention. Fig. 2 is a view in front elevation of the upper portion of the loom, showing a dobby or other form of head motion from whence the "calling" of the respective classes of shuttles is effected. Fig. 3 is a top plan view of the near end of the loom as shown in Fig. 1 and illustrating some essential parts of the invention. Fig. 4 is a front view of a detail showing a portion of what is seen in Fig. 3. Fig. 5 is a view in side elevation of a certain clutch, and Fig. 6 is a diagrammatic view illustrating the means for raising and lowering the swivel-batten.

In the loom-frame *a* is journaled the usual cam or tappet shaft *b*.

c is one of the picker-sticks pivoted in a rocking frame *d*. In bearings *f* is journaled a shaft *g*, which carries an upwardly-projecting crank *h*, connected with the picker-stick in the usual manner by a strap *i*. On this shaft *g* is an arm *j*, projecting inwardly and having its free end bifurcated. In the bifurcated portion of the arm is a pivoting bolt *k*,

on which is fixed a block *l*, which carries an antifriction-roller *m*. When the block and its roller form an alined or longitudinal extension of the arm *j*, the cam *n* on cam-shaft *b* will as it rotates impinge against the roller and depress the arm, thus rocking the rock-shaft *g* and vibrating the picker-stick in an obvious manner. When the block is turned on its pivot in arm *j* to the right sufficiently to clear the cam *n*, the shaft *g* will cease to be rocked, and consequently the picker-stick will stand idle. The means for controlling the position of block *j* will be later described.

On the cam-shaft *b* is fixed a collar *o*, and arranged to turn on the shaft is a mutilated gear *p*, having a lateral flange *q*. The flange is formed with a break or opening, as at *r*, the same being disposed adjacent the teeth *s* (relatively few in number) of the mutilated gear.

t is a hook-pawl pivoted on the inner face of the gear *p* and adapted to engage in a notch *u* in the collar *o*, so that when the shaft is rotating in the direction of the arrow in Fig. 5 the collar will drive the gear. In a bracket *u'* is journaled a stub-shaft *v*, on which is fixed a pinion *w*, a star-wheel *x*, and a crank *y*. The pinion is adapted to be engaged by the teeth of the mutilated gear *p*, so that the shaft *v* may be driven from shaft *b*, and the star-wheel *x* has the peripheral indentations *z* thereof formed to fit the periphery of the flange *q* of gear *p*, so that between the pinion and star-wheel and the gear *p* and its flange is produced the mechanical movement known as the "Geneva stop-motion." The crank *y* is connected with a crank 1 on the lower end of a rod 2, journaled in a bracket 2', projecting from the rocking frame *d*, in which the picker-stick is fulcrumed by a system of levers comprising a bell-crank lever 3, fulcrumed in the frame *a*, a link 4 connecting one end of said bell-crank lever with the crank *y* and a link 5 connecting the other end of said bell-crank lever with the crank 1. The rod 2 carries at its upper end a crank 3', which is in turn connected, as by a link or otherwise, with the swivel-shuttle rack in a manner well known. (See United States Letters Patent No. 691,927.)

From the foregoing it will be seen that so long as the pawl *t* is permitted to lock the collar and gear *p* an intermittent reciprocating and dwell motion will be imparted to the shuttle-rack. If the pawl *t* is disengaged, however, from the collar *u*, the latter will continue to rotate with the shaft without driving the gear *p*, and by consequence without oscillating the rod 2 through the mechanism which connects said gear with the rod.

6 is a lever fulcrumed in the loom-frame *a*. This lever is controlled from one of the jacks 7 of the dobby or other form of head-motion 8 through a flexible connection 9, passing over a segment 10, fulcrumed at 11 in the frame *a*. To one arm of lever 6 is connected the upper end of a flexible connection 12, which is in turn connected to the free end of a dog 13, which hooks over the free end or point 14 of the pawl *t*. The same arm of lever 6 is connected with a lever 15, fulcrumed in frame *a* by a link 16. On the pivoting-bolt *k* is fixed a drum 17, to which the end of a chain 18 is fixed and around which said chain is adapted to extend. This chain is connected with the lever 15 by a link 19. A spring 20, coiled about the bolt *k* and inclosed in the drum, tends to turn the same, so as to wind the chain thereon, one end of said spring being for this purpose fixed to the arm *j* and the other end to the drum.

The swivel-batten 21 acts by gravity to drop into working position. It is adapted to be elevated by flexible devices 22, which are connected at their free ends to the guide-rods 23 of the swivel-batten and extend over rollers 24 and under rollers 25 on the main batten structure 26, whereupon they merge into a common flexible connection 27, which is connected to the lever 6.

28 is a spring connecting the lever 6 with the frame in such manner as to pull up on the connection 27, and so tend to normally keep the swivel-batten elevated.

Before describing the operation it should be particularly remarked, with reference to the operation of dog 13 and pawl *t*, that when the former is allowed to drop by the lowering of the adjacent end of lever 6 it acts to lift pawl 14 out of engagement with collar *o*, but that when it is raised it clears the pawl and permits the latter to stand interlocked with the collar *o*. This effect is the result of that disposition of the two fulcrums—*i. e.*, of the dog and pawl—at the time when the pawl is most proximate the dog, whereby if the dog is lowered sufficiently to engage the pawl the latter as it rotates with the gear *p* will have its end 14 caught by the dog, and so drawn out of engagement with the collar *o* in the manner indicated in Fig. 5, whereas if, on the other hand, the dog is lifted sufficiently to clear the pawl the latter will continue to interlock the collar and the gear as they rotate.

As the parts are shown in Fig. 1 the jack 7

stands in the position where the left-hand end of lever 6 is lowered. The swivel-batten is therefore elevated, so that its shuttles are clear of the shed, and dog 13 is also lowered, thus acting to hold pawl *t* disengaged from collar *o*, while spring 20 is permitted to act to throw the block *l* into aligned disposition with reference to arm *j*, so that the roller *m* is in position to be impinged by the cam *n*. If shaft *b* is rotating, cam *n* will now act through the arm *j* to rock shaft *g*, and so work the picker-stick and consequently the main or fly shuttle. Upon jack 7 being actuated to pull on flexible connection 9 the left-hand end of lever 6 will be raised, causing in an obvious manner the depressing of the swivel-batten into working position and the raising of dog 13 out of engagement with pawl *t* and the turning of block *l* on its pivot *k* far enough so that its roller is clear of cam *n*. Thus rock-shaft *g* will not be vibrated, and consequently the picker-stick and the fly-shuttle will stand idle, while pawl *t* will be permitted to drop down onto the periphery of collar *o*, so that as the latter rotates the pawl will be brought into engagement with notch *u*, and thus interlock the collar and the gear. So long as the dog is permitted to stand elevated the rotary action of shaft *b* will act to oscillate rod 2 through the parts now made to connect said rod with the shaft in an obvious manner, with the result that to the swivel-shuttle rack will be imparted the desired reciprocating and dwell movement.

It will be observed that adhesion between parts *p* and *b* as the former rotates and the checking of any tendency toward consequent movement of part *p* with part *b* by the pawl's engaging with dog 13 would operate more or less to induce a vibratory action in part *p*. This may be prevented by providing a notch 29 in the periphery of the gear *p* and a check-pawl 30 to engage said notch. This check-pawl is pivoted on a stud 31 (on which dog 13 is also pivoted) and is so disposed that at the limit of upward movement of the pawl *t* when engaged by dog 13 it takes in the notch and stops the vibratory effect.

32 is a pin carried by check-pawl 30 and extending over the dog 13, so that when the latter is lifted by lever 6 the check-pawl will be lifted.

The function of the segment 10 is to protract the length of time that the swivel-batten is in working position, so as to give the swivel-shuttles full opportunity to act. The result obtained is due to the fact that when the jack is pulling upwardly on the flexible connection 9 and while it is approaching its limit in this direction said connection 9 is opposed to the flat surface of the segment, with the consequence that the movement slows down more gradually and sooner than if part 10 were perfectly circular, and, vice versa, on the return movement the action is slow at first and then relatively quick.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a swivel-loom, the combination of the
5 frame, a rotary shaft, an oscillatory swivel-shuttle-rack-driving rod, means for transmitting motion from the shaft to the rod comprising a part arranged to turn loosely on the shaft, a peripherally-notched collar fixed on
10 the shaft, a pawl carried by said part and adapted to engage in said notch to interlock said part and the collar, and a dog having a pivot remote from that of the pawl and movable into engagement therewith to disengage
15 the same from the collar, substantially as described.

2. In a loom, the combination, with the frame, of the cam-shaft, a picker-stick, a vibratory part, operative connecting means between the vibratory part and the picker-stick,
20 and another part carried by said vibratory part and pivoted in the same, said part being movable into and out of the path of movement of the cam on said cam-shaft, substantially as described.
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3. In a loom, the combination, with the frame, of the cam-shaft, a picker-stick, a vibratory part, operative connecting means between the vibratory part and the picker-stick,
30 another part carried by said vibratory part and pivoted in the same, said part being movable into and out of the path of movement of the cam on said cam-shaft, and means for normally holding said last-named part in the path
35 of said cam on said cam-shaft, substantially as described.

4. In a loom, the combination, with the frame, of the cam-shaft, a picker-stick, a vibratory part, operative connecting means between the vibratory part and the picker-stick,
40 another part carried by said vibratory part and pivoted in the same, a spring connecting

the pivoted part and the vibratory part and normally holding the former in a given position, and means for moving the pivoted part
45 against the tension of its spring, substantially as described.

5. In a swivel-loom, the combination of the frame, a rotary shaft, an oscillatory swivel-shuttle-rack-driving rod, means for transmitting motion from the shaft to the rod comprising a part arranged to turn loosely on the shaft, a peripherally-notched collar fixed on the shaft, a pawl carried by said part, adapted to engage in said notch to interlock said part
55 and the collar and having its free end projecting in the direction of rotation of the shaft, a dog pivoted independently of said part and adapted to project into the path of movement of the pawl to engage the same and cause the
60 unlocking of said part and the shaft and the stopping of rotation of the former, and a check-pawl engageable with said part and acting thereon reversely to said dog, substantially as described.
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6. In a swivel-loom, the combination of the frame, the main batten structure, the elevatory swivel-shuttle batten arranged in said main batten structure, an actuating means, a flexible connecting means between the swivel-shuttle batten and said actuating means, and
70 a segment pivoted in said frame, said flexible connection being extended around the segment and having a movement with the actuating part sufficient to bring the flat side of the segment adjacent said flexible connection, substantially as described.
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In testimony that I claim the foregoing I have hereunto set my hand this 29th day of September, 1903.

JAMES H. FARRAR.

Witnesses:

JOHN W. STEWARD,
ROBERT J. POLLITT.