

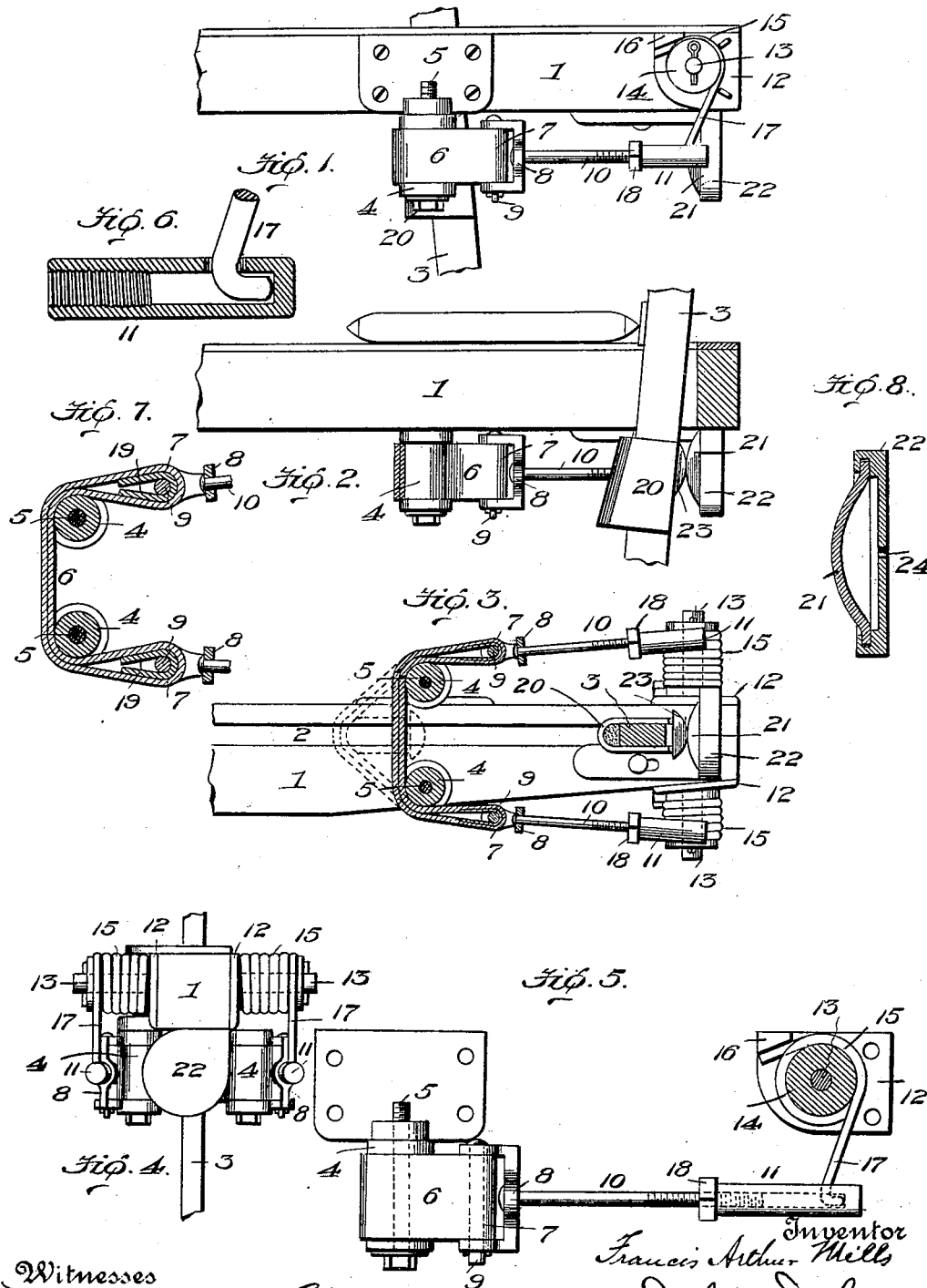
No. 676,658.

Patented June 18, 1901.

F. A. MILLS.
PICKER STICK BUFFER FOR LOOMS.

(Application filed Mar. 23, 1901.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

FRANCIS ARTHUR MILLS, OF METHUEN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO GROSVENOR B. EMMONS, OF SAME PLACE.

PICKER-STICK BUFFER FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 676,658, dated June 18, 1901.

Application filed March 23, 1901. Serial No. 52,467. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS ARTHUR MILLS, a citizen of the United States, residing at Methuen, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Picker-Stick Buffers for Looms, of which the following is a specification.

For the picker-stick motion of looms I have produced an improved strap-buffer and torsion-spring device for the impact of the picker-stick, whereby to cause a more accurate throw of the shuttle, to regulate the flight of the shuttle, and to prevent the destructive and deranging effects of the picker-stick motion in throwing the shuttle, and the precise improvement will be set out in the claims hereto appended in connection with the accompanying drawings, in which—

Figure 1 shows in front view a portion of the right end of the race-lay, the strap-buffer device thereon, and part of the picker-stick in the position it occupies after having thrown the shuttle. Fig. 2 is a vertical section of the same, the picker-stick in the position to deliver its impact upon the strap-buffer in throwing the shuttle. Fig. 3 is a horizontal section looking at the under side of the race-lay, showing the strap-buffer and its torsion-spring connections with the end of the race-lay. Fig. 4 shows an end view of the race-lay and its torsion-spring connections for the strap-buffer. Fig. 5 shows, enlarged, the strap-buffer and its torsion-spring coiled upon a loosely-mounted hub and having a long arm connecting the strap-buffer. Fig. 6 shows the bearing connection of the torsion-spring arm with the oil-socket of the arm which connects the strap-buffer. Fig. 7 shows in horizontal section the doubled strap-buffer and its loose mounting-rolls. Fig. 8 shows the pneumatic-buffer device in section.

The race-lay, its operating connections, and the picker-sticks and mechanism for actuating them for throwing and for receiving the thrown shuttle being well known in the art, it is deemed unnecessary to either show or to describe such mechanism or to particularly set out the necessity for giving the shuttle a true throw, as it is well known that the breaking of the cops and many other troubles re-

sult from the great force of the blows of the picker-stick in throwing the shuttle and receiving it.

Depending from the under side of the race-lay 1 and on each side of the slot 2 therein in which the picker-stick 3 moves are a pair of spools 4, mounted to turn freely on fixed studs 5 5, one directly opposite the other. On these spools is mounted the buffer-strap 6 in a doubled form, one layer upon the other, with the doubled ends forming loops 7 7, extending from the spools parallel to each other toward the end of the race-lay, so that the strap crosses the path of the picker-stick, the impact of which in throwing the shuttle is delivered upon the strap between the spools, and thereby drives it away from the spools. In receiving the blow of the picker-stick the impact side of the strap is supported by the outer layer, while the looped ends of the strap are separately connected to an adjusting device on each side of the lay. A yoke 8 connects by a bolt 9 each looped end of the doubled strap, and a rod 10 mediate-ly extending from each yoke terminates in a screw-thread. A tubular screw-threaded arm 11 engages each yoke-rod and extending to about the end of the lay is engaged by a spring device having a torsional action. At each side of the lay at its end is secured a plate 12, from which extends a horizontal stud 13, on which is loosely mounted a hub or roll 14, fastened by a pin in the stud. On each of these hubs or rolls is coiled a spring 15, one end of which engages a lug 16 on the plate 12, while the other end of the coil terminates in an arm 17, which depends from the front side of the coil and engages the outer end of the screw-threaded arm. The impact upon the strap-buffer in forcing the strap inward between its loose mounting-rolls is thereby caused to pull the looped ends of the strap back, and drawing the yoke-rods back will pull with them the depending ends of the spring-coils, and thereby cause a torsional action of the coils on their hubs or rolls, so that they are caused to rock with the coils on their fixed studs under each impact blow of the picker-stick upon the strap-buffer. This torsional action of the springs and the free rolling or rocking of their mounting-hubs gives

the important advantage of a uniform and perfect yielding action of the strap-buffer, which is necessary to its life and the proper throwing of the shuttle. This torsional action of the spring also better fits it for the adjustment of its torsional force to suit the requirements in throwing the shuttle with a greater or less tension upon the strap-buffer. This adjustment is made by the yoke screw-rod and the screw-threaded arm and is fixed by the nutlock 18, and by such adjustment the speed of the shuttle is increased or is diminished. A tightly-stretched strap will give a comparatively slow speed to the shuttle, while a less tautness of the strap will give a comparatively fast speed to the shuttle, and I find that the mounting of a torsional spring upon a freely-rocking support greatly conduces to satisfactory results in maintaining the effective capacity of the two springs in their conjoint action upon the strap and the action of the latter in yielding under the blow of the picker-stick in the throw of the shuttle.

The bearing of the torsion-spring arm is formed by a terminal bend which enters freely a hole in the arm and abuts against the end of the socket which intersects the hole, as in Fig. 6. The importance of this construction is that the socket will hold the oil and the graphite and cause the bearing-point of the spring to last a long time. This joint is easy to make and durable and the spring is set in place with only a free bearing connection at each end. The short arm of the spring stands tangentially from the coil with a free bearing against the under side of the lug 16, and it is against this lug that the coil has a torsional resistance under the pulling of the long arm 17 under the impact of the picker-stick upon the strap-buffer.

The torsion-spring is better for throwing the shuttle, because its connection with the strap-buffer is made by a long arm, which is quicker to act than a spiral spring, is more durable and cheaper to make, requires no fastenings, and can be quickly applied and removed. The mounting of the spring on a loosely-mounted hub gives freedom for the coils and the hub to rock together when the strain is put on the long arm. This loosely-mounted hub carries and holds the spring, so that its long and short arms form the acting parts held securely in engagement with their free bearings by the hub.

The rolling of the spools and the delivering of the impact of the picker-stick, so as to force the strap away from the spools, relieves them of undue strain and prevents wear of the strap at the rolls, while the doubled form of the strap gives it much greater durability to withstand the blows of the picker-stick. The looping of the looped ends of the strap in the yokes keeps the strap layers taut and in proper relation to the spools by the action of the springs. To relieve the wear upon the looped ends by the yokes, each yoke-rod is provided with a supplemental leather loop 19, prefer-

ably, its ends standing open between the strap layers, and this reinforcement forms the wear parts for the yokes, and over and upon them the strap can be set, changed, and reversed, as may be deemed best.

The impact of the picker-stick upon the strap-buffer is preferably made by a stuffed bunter 20, fixed on the stick, and cushions the blow on the strap.

Provision is made for cushioning the blows of the picker-stick at the end of its flight across the lay by means of a pneumatic rubber buffer 21, depending from the end of the race-lay in the path of the picker-stick. The rubber buffers are suitably secured and sealed in a casing 22, which forms an air-chamber behind the rubber buffer and into which chamber the rubber is collapsed without resilient effect by the impact of the button-bunter 23 on the picker-staff, and thereby prevents the rebound of the shuttle, the form of the buffer and the vent 24 in the bottom of the chamber coacting to produce such result.

Obviously the pair of torsion-springs and their mountings may be used with any suitably-supported strap-buffer; but the construction shown is preferred.

I claim—

1. In a loom and in combination with a picker-stick, and the race-lay, of a buffer device for the inward throw of the picker-stick comprising a suitably-supported strap, a rod connected to each end thereof, a fixed stud standing horizontally from each side of the lay, a hub or roll loose on each stud and a torsion-spring on each hub or roll having one end engaging the lay and its other end engaging the said strap-connected rod.

2. In a loom and in combination with a picker-stick and the race-lay, of a buffer device for the inward throw of the picker-stick comprising a suitably-supported strap, a rod connected to each end thereof terminating in a screw, a screw-threaded arm engaging said strap-connected rod, a pair of studs one fixed on each side of the lay, a hub or roll loose on each stud and a torsion-spring on each hub or roll having one end engaging the lay and its other end depending from said hub and engaging said arm.

3. In a loom and in combination with a picker-stick and the race-lay, a stud fixed to and standing horizontally from each side of the race-lay, a hub or roll loose on each stud, a torsion-spring coiled on each hub, having one end connected to the lay, its other end depending from the side of the hub, a strap mounted to receive the inward throw of the picker-stick, a rod connected to each end of the strap extending toward the end of the lay and terminating in a screw, a screw-threaded arm engaging the screw-rod and the depending end of the torsion-spring, and a jam-nut on the rod for locking its connection with the arm.

4. In a loom and in combination with a picker-stick and the race-lay, of a buffer de-

vice for the inward throw of the picker-stick
comprising a suitably-supported strap, a rod
connected to each end thereof terminating
in a screw, a tubular screw-threaded arm hav-
5 ing a transverse hole intersecting the bore of
the arm and a torsion-spring mounted on each
side of the race-lay having one end of the
coil engaging the lay, its other end depend-
ing from the coil forming an arm terminating

in a right-angled end adapted to engage the 10
bore of the arm at its intersecting hole and
form a bearing against the end of the bore.

In testimony whereof I affix my signature
in presence of two witnesses.

FRANCIS ARTHUR MILLS.

Witnesses:

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CHAS. L. BURNHAM.