

J. D. COTTRELL.
Loom.

No. 217,270.

Patented July 8, 1879.

Fig. 1.

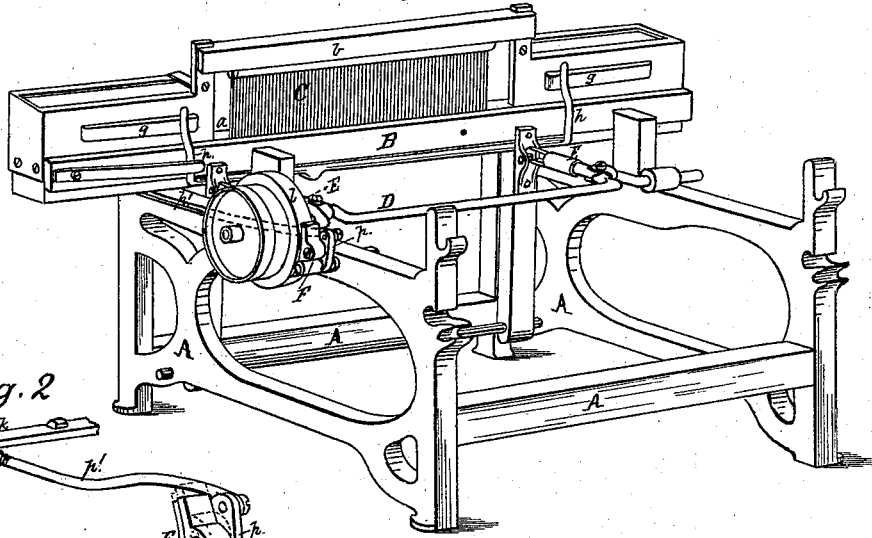


Fig. 2.

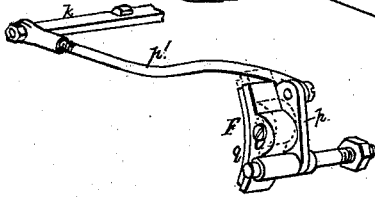


Fig. 4.

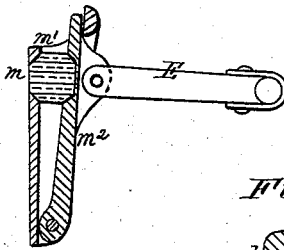


Fig. 7.

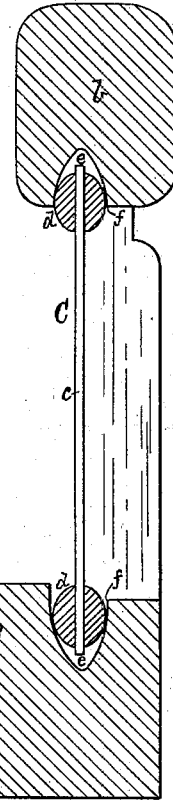


Fig. 3.

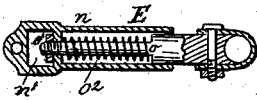


Fig. 6.

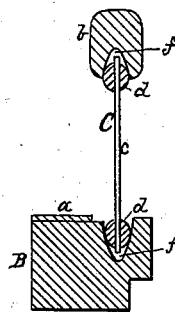
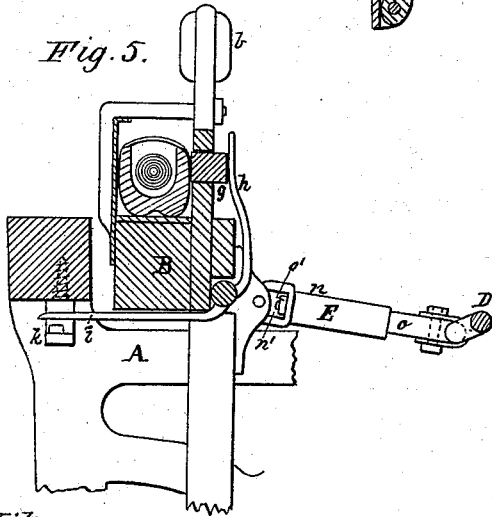


Fig. 5.



Witnesses

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IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. **217,270**, dated July 8, 1879; application filed February 6, 1879.

To all whom it may concern:

Be it known that I, JESSE D. COTTRELL, of Central Falls, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Looms; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a clear, true, and complete description of the several features of my invention.

My present improvements relate to high-speed looms, and they differ from certain improvements previously made by me in the same general connection in this: that although my former improvements were applicable largely to ordinary common-speed looms already in use, they involved considerable expense in rebuilding, while in accordance with my present invention ordinary looms may be cheaply provided with improvements by which their producing capacity can be largely increased, and, although such looms cannot generally be practically run at a speed equal to that with which a loom specially constructed to that end may be operated, the increased results in weaving accruing from these later improvements is of very considerable importance when considered with reference to the trifling outlay involved in their application.

Although my main object is to improve looms already in use, it is obvious that as a rule even better results can be attained on a loom newly constructed and embodying my present improvements than on an old loom provided therewith.

My invention partially consists in the combination, with a swinging lay having a reed rigidly mounted therein, a protector-bar, and a friction-brake operated through the protector-bar by the driving force of the lay, of cushioned pitmen for connecting the crank-shaft of the loom to the lay, whereby the liability of "smashes" in the warp and all undue shock as between the lay and protector-bar are obviated and the friction-brake operated under a yielding pressure.

I am aware that cushioned pitmen are not new, and that friction-brakes operated through the protector-bar by the driving force of the lay have been used before, and that such brakes

have been operated under a yielding pressure, and also that the driving force of the lay as against the protector-bar has been heretofore modified by the employment either of a spring-dagger or a spring-reed frame capable of movement independently of the lay; but I am not aware that all of the advantages above recited were ever attained prior to my present invention without a swinging or spring reed frame, which is the particular feature I seek to avoid, such a reed-frame not being used on ordinary looms, and being difficult of addition to such looms as were originally constructed with lays which rigidly carry their reed.

While it is important that the individual elasticity of the dents of the reed be preserved as far as possible, it is equally important that the reed, as a whole, be firmly held by the lay; and to attain that end the lay-plate, or the edge of the lay which corresponds in its position with the rear upper edge of a lay-plate, has been usually heretofore made to serve as a fulcrum, against which the reed will bear when, after its insertion into its bed in an inclined position, it is turned upward into its proper vertical position and confined by the top bar or hand-rail. It is also well known that the dents of the reed project through their binders, and that vertical pressure applied to the reed when fitted to the lay as heretofore causes the dents to bend to the right or left, and to stand in curved lines instead of being straight and parallel with each other, as when in their normal condition. In this connection my invention further consists in a lay-bed and a hand-rail provided with longitudinal recesses having tapered sides, whereby, when a reed is contained in said recesses, and vertical pressure is applied for firmly securing it therein, the dents of the reed will be free from end pressure.

It is obvious that if the lay-recess only had inclined sides, while that in the hand-rail was as heretofore, the dents would not be so liable to be bent as if pressure was applied to both ends of the dents, because of a slight possible endwise self-adjustment; but this is objectionable, as tending to loosen the dents in their binding.

With recesses of the character stated reeds

may be securely held, regardless of the varying bulk of the binding employed in their construction.

Looms, when run at ordinary speed, as a rule require no braking mechanism for operating auxiliary to the usual stopping mechanism; but in proportion as the speed is increased the necessity for a brake is obviously augmented. With high-speed looms as heretofore devised by me, braking mechanism is employed proportionate in its capacity to the extraordinary high speed of the looms; but for use with looms now in use, when changed as herein set forth, a less powerful brake will be actually required, because of the comparatively moderate increase of speed at which I propose to operate them, and it is also desirable that said brake be simple, inexpensive, and easily released. In this connection my invention further consists in the combination, with a friction-drum on the crank-shaft in a loom, of a brake-shoe provided with a slot and a lever, on which said shoe is mounted by means of a stud in its slot, and which is controlled by the daggers of the stopping mechanism.

The friction-brake constructed and controlled as described is of particular value in connection with spring-cushioned pitmen or sweeps, because, when the loom is brought to a dead stop, the spring-cushion of the pitmen causes a slight rotary movement of the friction-drum in a direction contrary to that in which it had been driven, and this slight movement of the drum is sufficient to effect a release of the brake. When the brake-shoe is thrown against the drum by the lay striking with its dagger against the protector-bar the shoe has a tendency to rise on its stud, because the brake-shoe-stud slot is inclined upward and rearward from the concave face of the shoe; but the drum with its periphery moving in an opposite direction more or less overcomes the rising tendency of the shoe, and the friction of the coincident surfaces, increased as it is by the tendency of the shoe to rise, promptly stops the loom. The springs of the sweeps being compressed when the loom stops serve to slightly rotate the crank-shaft and drum in the opposite direction from that in which it had been before revolving, and this slight movement causes the shoe to rise on its stud, and by reason of the inclined slot it retires as it rises from close contact with the drum, thereby permitting the lay to be freely thrown rearward by hand.

To more particularly describe my invention I will refer to the accompanying drawings, in which—

Figure 1 represents, in perspective, so much of a loom as is necessary to illustrate my improvements. Fig. 2 represents the brake of the loom detached. Figs. 3 and 4 represent, partially in section, cushioned pitmen detached. Fig. 5 represents the breast-beam and one shuttle-box in vertical lateral section, showing well-known dagger-stopping mechanism.

Figs. 6 and 7 represent, respectively, in lateral section, and on an enlarged scale, the lay with reed mounted thereon.

The frame A of the loom is as heretofore. The lay B is provided with a lay-plate or race-plate, *a*, and hand-rail *b*, as heretofore; but the recesses in the lay and hand-rail for receiving and rigidly holding the reed C are of novel construction.

In Figs. 6 and 7 it will be seen that the dents *c* of the reed project through the binding *d* at top and bottom of the reed, forming longitudinal projections or ribs *e*. The recesses *f* in lay and rail, instead of having a full rounded surface at the bottom, as heretofore, have inclined sides, so that the binding of the reed takes a bearing wholly at the sides thereof and not at the ribs *e*, formed by the projecting dents.

It will be seen that the ordinary variation in the bulk of the reed binding will not prevent their being firmly held on the lay, and that, there being no pressure upon the ends of the dents, they cannot be crippled or bent, as is frequently the case when mounted in recesses constructed or formed as heretofore.

The race-plate *a*, instead of having its rear edge projecting over the recess, so as to bear against the front face of the reed when in position, as usually heretofore, is so proportioned to the bed of the lay, and so set thereon, that its rear edge is not in contact with the dents of the reed, thereby permitting them to spring freely while working over knots in the warp.

The shuttle-box, swells *g*, levers *h*, daggers *i*, and protector-bar *k* are all as heretofore.

The crank-shaft D is provided with the usual fast and loose pulleys, and it has also the friction-drum *l*, as heretofore.

The crank-shaft and lay are connected by cushioned pitmen or sweeps E, two varieties of which are shown in the drawings.

In Fig. 3 a pitman is shown as heretofore constructed. Therein is a tubular socket, *n*, which is provided with an eye for connection with the lay and a slot, *n'*, at the same end; also, within the socket a spring and a bolt, *o*, which at one end is provided with the usual box and strap for connection with the crank-shaft, and at the other end with a screw-thread, which passes through the end of the socket, and receives a nut, *o'*, which is within the slot *n'*, and thereby prevented from turning. The spring *o*² abuts against the inner end of the socket and an annular shoulder on the bolt, thus affording a cushion for the pitman. In Fig. 4 I show how the ordinary wooden pitmen, if slightly shortened, may be cushioned.

The cushion *m* is located within a recess in a spring-holder, *m*¹, secured to the rear side of the lay. A plate, *m*², with ears drilled to receive a pin, is hinged or pivoted to the lower portion of the spring-holder, and this plate has a rear bearing against the cushion *m*. The upper end of plate *m*² projects through an opening in the top of the spring-holder, which admits of such movement of the plate on its

pivot as the spring or cushion *m* will permit. The pitman is connected with the plate by means of a pin through the ears and to the crank-shaft in the usual way. The force of the springs or cushions may be regulated in any desirable manner. The socketed pitman requires to be disconnected at either end, and then rotated to tighten or relieve the spring. The force of the cushion *m* may be regulated by the employment of any obvious means—as, for instance, a screw through the lay, which will engage with a back plate at the rear of the spring, so that the latter may be compressed or relieved from pressure, according to requirements.

The brake *F* is composed of two main parts—a lever, *p*, pivoted to the side of the frame near the friction-drum *l*, and a shoe, *q*, usually clad on its concave face with leather or other suitable material. The lever *p* is connected from its upper end by a rod, *p'*, with the protector-bar *k*, so that when the latter is moved by the daggers the lever will move toward the periphery of the friction-drum. The shoe *q* is loosely pivoted upon the lever *p* by means of a stud which occupies a slot which is diagonal to the curved face of the shoe.

When the brake-shoe is in its normal position it is depressed and supported by the upper end of its slot resting upon its stud, but when elevated it occupies the position shown in dotted lines. It will be seen that one side of the diagonal stud-slot is inclined upward and rearward from the concave face of the shoe. When the brake-shoe is carried forward against the drum by the protector-bar the shoe has a rising tendency, but the oppositely-moving surface of the drum more or less overcomes this tendency. When the loom has been stopped the slightest backward movement of the drum permits the rising tendency of the shoe to prevail, and in rising it retires from holding contact with the drum. The lay being then free to be easily moved rearward releases the protector-bar, and the shoe moving rearward with its stud falls to its normal position.

With the spring-sweeps the rearward rotary movement of the drum is effected by the expansive power of the springs or cushions, and the release of the drum from the power of the brake is therefore automatic.

The operation and effect of the several features of my invention having been sufficiently described in connection with the detailed description, it is deemed unnecessary to describe the operation of the loom as a whole.

With my improvements applied to ordinary low-speed looms I have been enabled to safely increase the speed, so as to augment the production at least ten per cent. net, although the average increase is much greater than that, while the cost of the improvements as so applied is so low that the gain accruing from their use results in a speedy reimbursement.

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

1. The combination, with a swinging lay having a fixed reed mounted thereon, a protector-bar, and a friction-brake operated through the protector-bar by the driving force of the lay, of cushioned pitmen for connecting the crank-shaft and lay, substantially as described.

2. The lay and hand-rail provided with reed recesses having inclined sides, substantially as described, whereby a reed may be mounted and secured without pressure on the dents thereof, as set forth.

3. The combination, with the lever, the protector-bar, and the friction-drum on the loom crank-shaft, of a brake-shoe, which is mounted by a slot and stud on the lever, substantially as described, whereby, after stopping the loom, and the crank-shaft is moved slightly backward, the shoe will rise on its stud free from the drum, as set forth.

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