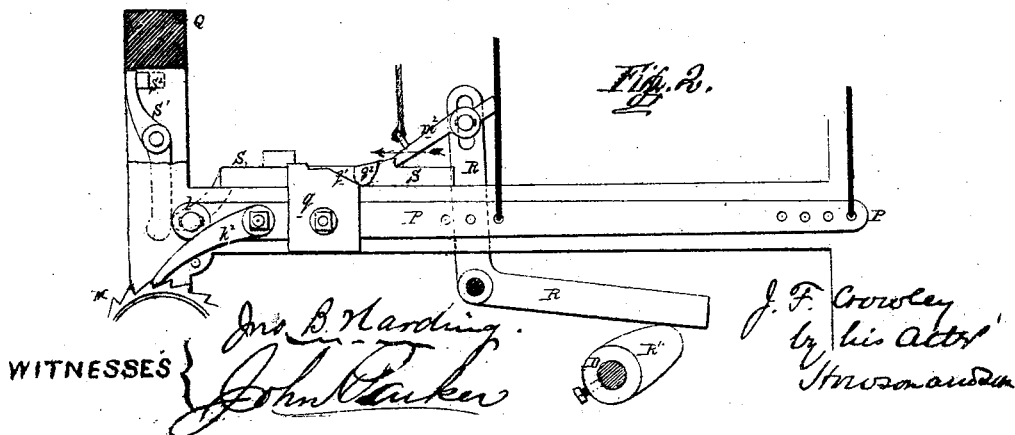
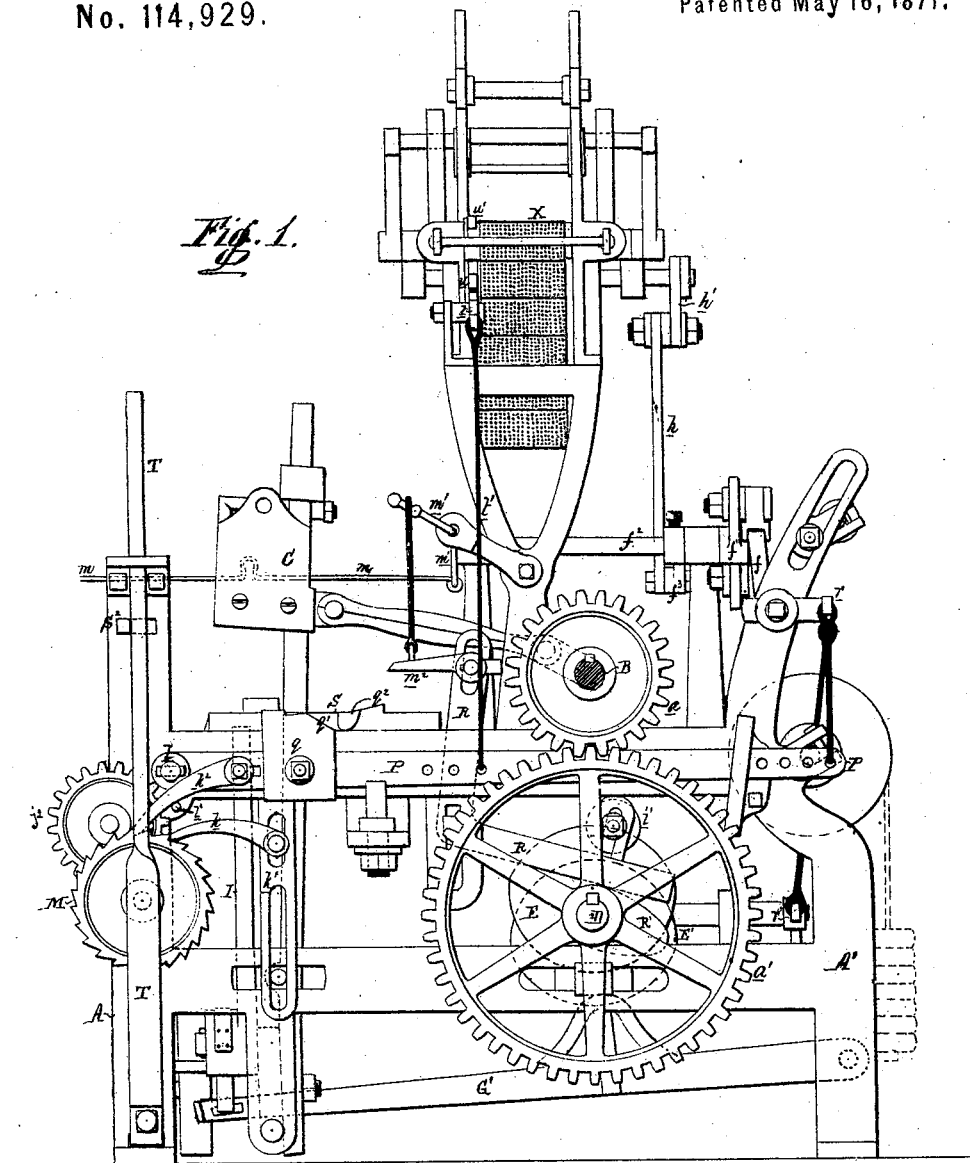


J. F. CROWLEY.
Improvement in Looms.

No. 114,929.

Patented May 16, 1871.

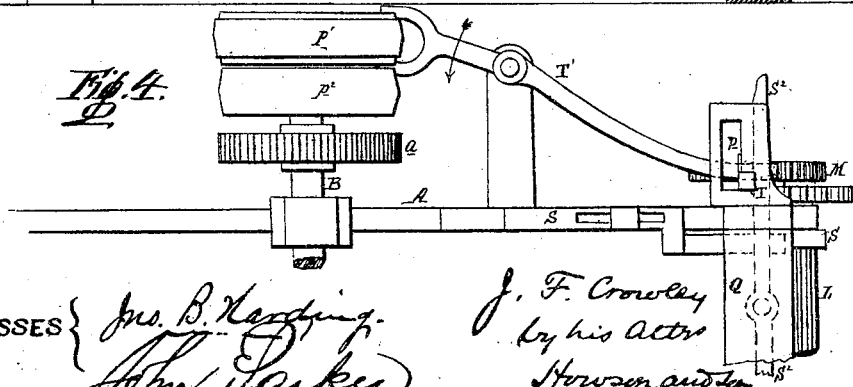
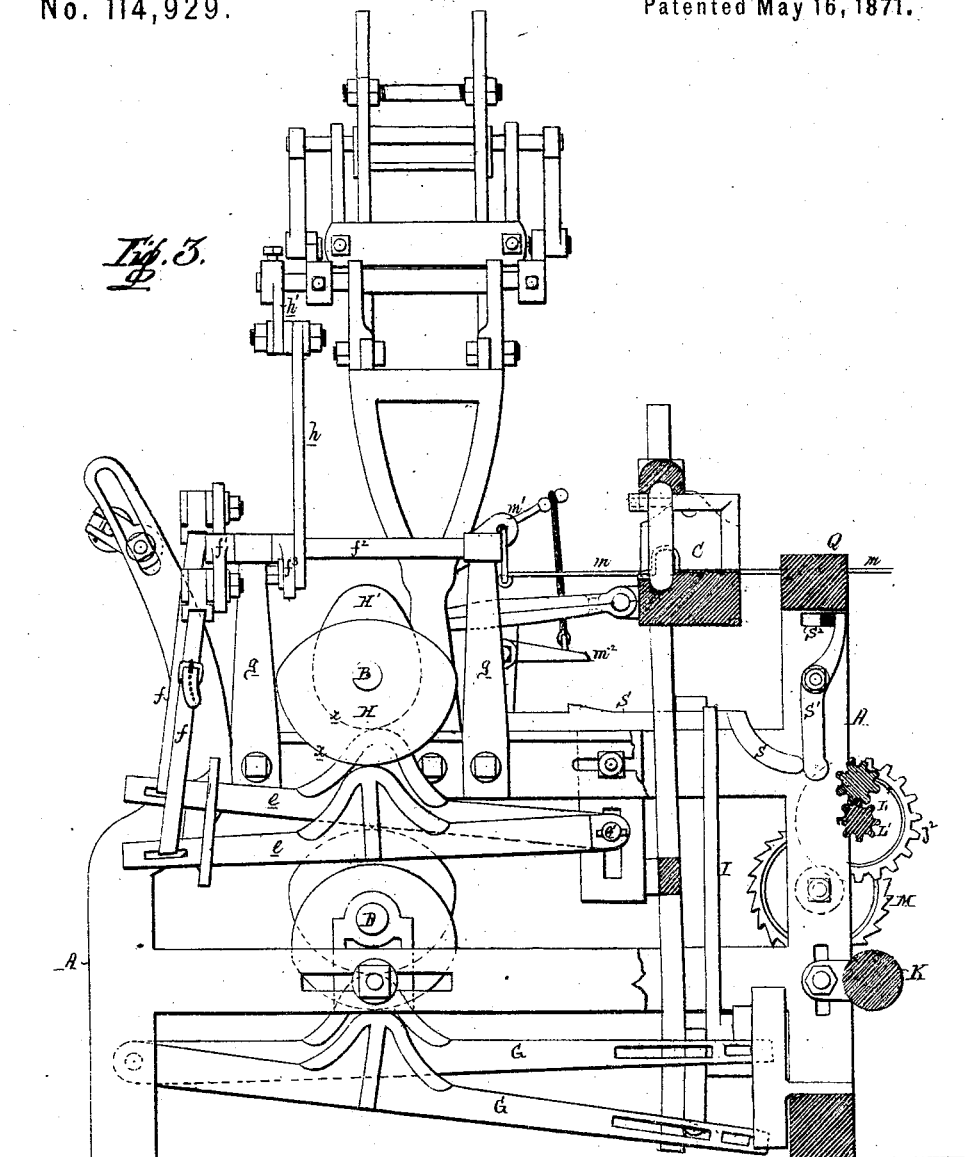


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John Parker

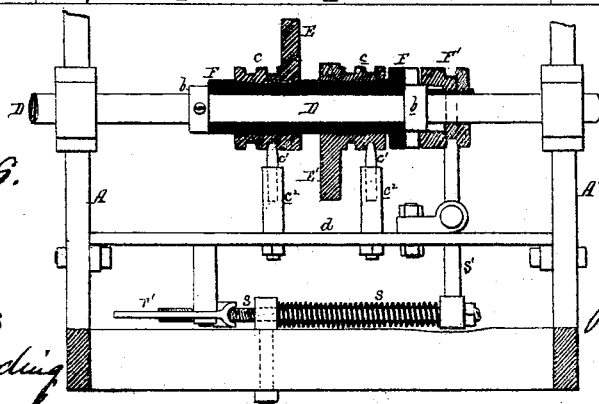
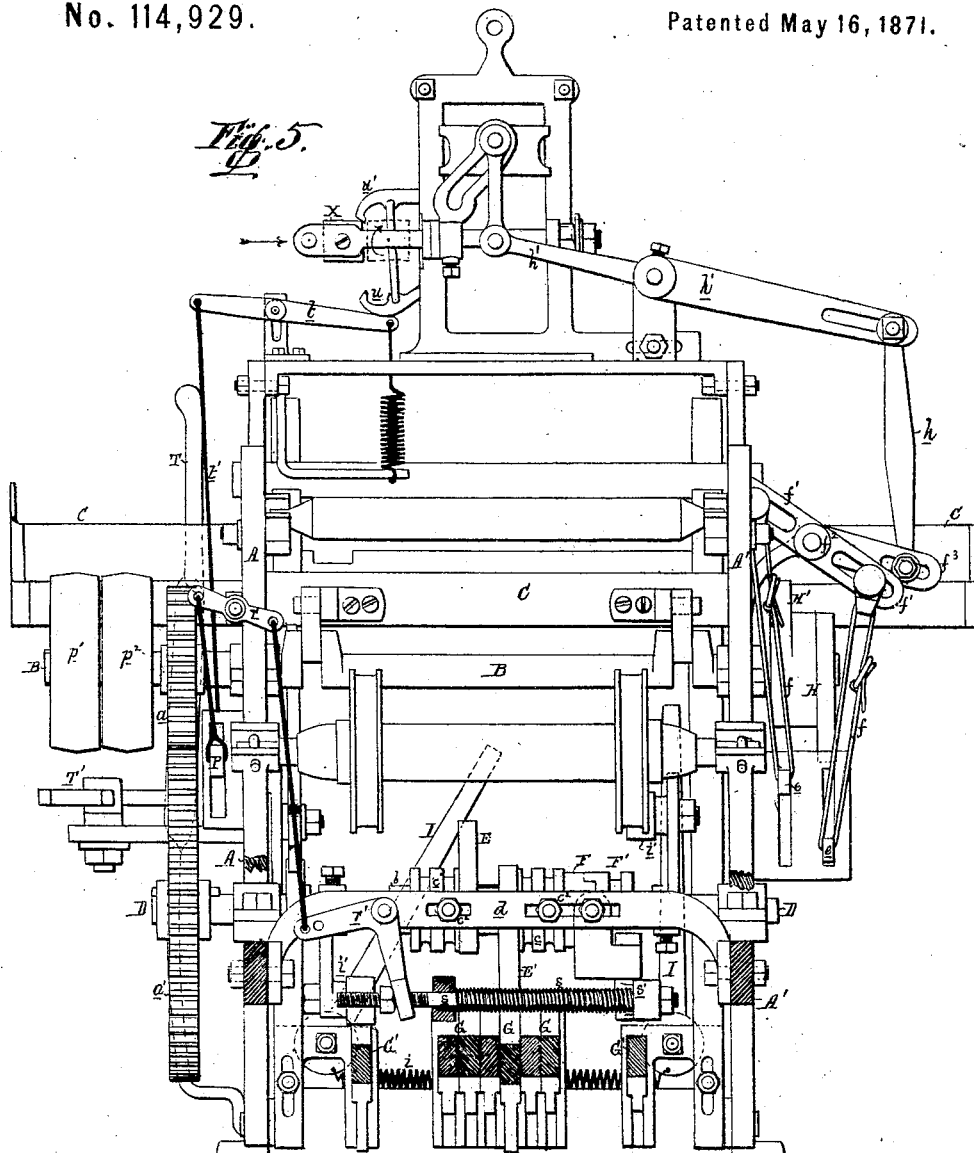
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J. F. CROWLEY.

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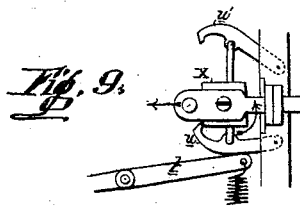
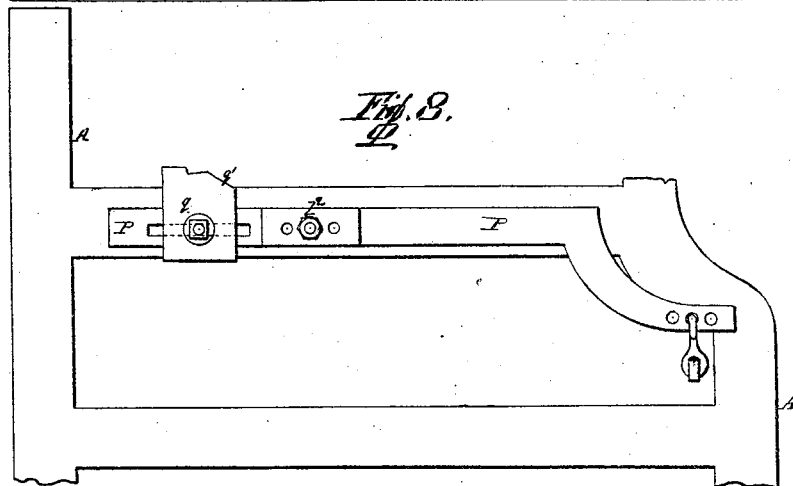
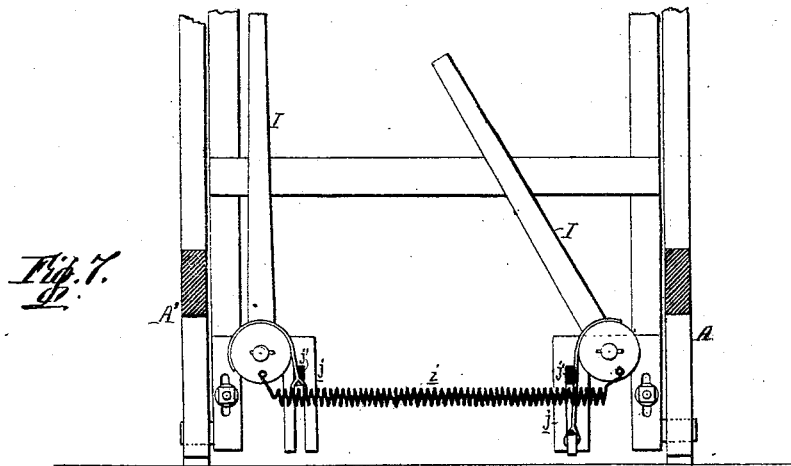
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by his Attys
Hewson and Son

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Andrew Anderson

United States Patent Office.

JEREMIAH FRANCIS CROWLEY, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 114,929, dated May 16, 1871.

IMPROVEMENT IN LOOMS.

The Schedule referred to in these Letters Patent and making part of the same.

I, JEREMIAH FRANCIS CROWLEY, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improved Loom, of which the following is a specification.

Nature and Object of the Invention.

My invention consists of certain improvements, too fully described hereafter to need preliminary explanation, in that class of looms in which both a Jacquard apparatus and treadles operated by cams are employed.

Description of the Accompanying Drawing.

Figure 1, sheet 1, is a side elevation of my improved loom;

Figure 2, a detached view of a portion of the same, partly in section;

Figure 3, sheet 2, a longitudinal section viewed from a side opposite to that shown in fig. 1;

Figure 4, a plan view of the driving-gear and belt-shifter;

Figure 5, sheet 3, an end view of the loom, partly in section;

Figure 6, a transverse sectional view of the lower portion of the loom through the cam-shaft; and

Figures 7, 8, and 9, sheet 4, detached views illustrating portions of my invention.

General Description.

The frame of the loom is of the usual form and construction, and consists of side pieces A and A' suitably connected together, and supporting the driving or crank-shaft B, which operates the lathe C in the usual manner, and communicates motion, through cog-wheels *a* and *a'*, to the cam-shaft D.

There are, in the present instance, two cams, E and E', upon the cam-shaft.

These cams, however, instead of being hung directly to the shaft, are attached to and arranged to slide longitudinally upon a feathered sleeve, F, which can turn loosely upon the shaft between collars *b b* of the same, or be made to revolve with the said shaft when held by a clutch, F', as hereafter described. (See fig. 6.)

The cams are intended to operate the treadles or levers G G G in the usual manner, and at one side of each of the said cams is a scroll-wheel, *c*, to which is adapted a caster-pin, *c'*, of a rod, *c''*, hung to a cross-bar, *d*, of the frame of the loom, the object of this arrangement being to cause the cams to slide upon the sleeve F and across the treadles as they are rotated, in order that they may successively depress the said treadles.

In addition to the cams and treadles the loom is also provided with a Jacquard apparatus of ordinary construction.

The Jacquard, however, instead of being operated by cranks or eccentrics on the driving or lathe-shaft B, as usual, receives its motion from cams H and H' of a peculiar shape, hung to the end of the said shaft, outside of the frame A' of the loom.

These cams act upon levers or arms *e e* hung to a stud, *e'*, of the frame, and the outer ends of the said arms are connected by cords or straps *f* to a lever, *f'*, of a rock-spindle, *f''*, hung to standards *g g* of the stationary frame.

An arm, *f'''*, of the rock-spindle, through the medium of a connecting-rod, *h*, communicates the required reciprocating motion to the operating-lever *h'* of the Jacquard.

I propose, in some cases, to dispense with the lever *f'*, rock-spindle *f''*, and connecting-rod *h*, and to connect the straps *f* directly to operating-arm *h'* of the Jacquard, one of the said straps being in such case passed over a pulley above the operating-arm, so that it may raise the latter while the other serves to depress it.

It will be observed, on reference to fig. 3, that the cams H and H' are of such a form that they only act upon the levers *e e* during a portion of their revolution, the levers remaining stationary during the time that they are in contact with the portions *x x* of the cams, which are of a curve described from the center of the shaft.

When the levers remain stationary the Jacquard is also inoperative, and this occurs at a time when the shed is open for the throwing of the shuttle, and when it is, therefore, important that the heddles should not be raised or lowered.

It will thus be seen that by the employment of the special cams H and H', and devices connected therewith, an intermittent motion of the Jacquard apparatus can be much more readily obtained than by cranks or cams, as heretofore arranged, so that the cloth can be better covered or crossed than usual, while the Jacquard, instead of being permitted to fall suddenly, as in ordinary looms, is gradually lowered by the cams.

The arms or picking-sticks I I for operating the cords, and other devices for throwing the shuttles, are hung to short spindles or studs of the stationary frame, are connected together by a spring, *i*, fig. 7, and are operated in the usual manner by levers or treadles, G', which receive their motion from cams or arms *i'* of the cam-shaft D.

The outer ends of the treadles G' pass through and are guided by slotted plates *j*, to which are fixed buffers *j'*, of leather, gum, cloth, or other suitable material, against which the ends of the said treadles strike when they are released by the arms of the cam-shaft, and raised by the action of the spring *i* simultaneously with the throwing back of the sticks I.

The jarring of the parts and disagreeable noise occasioned by the striking of the ends of the treadles is thus avoided.

In weaving with my improved loom the cloth is not wound at once upon the cloth-roller K, or, after having been passed between plain rollers, but is first passed between take-up rollers L and L', fig. 3, the surfaces of which are broken by longitudinal ribs arranged at equal distances apart, and which mesh into each other in the same manner as the teeth of cog-wheels.

These rollers, which effectually prevent any slipping of the cloth, are driven by a cog-wheel, P, on the journal of the lower roller L', which gears into a pinion on a short spindle, to which is also hung a ratchet-wheel m, the latter being driven by a pawl, k, hung to an arm, k', which is pivoted to the stationary frame and attached to the lathe C.

The slipping of the ratchet is prevented by a second pawl, k², hung to a lever P, which is pivoted to the side-frame A at the point l, the said pawl being raised from between the teeth of the ratchet-wheel by a fixed pin, l', when the lever P is lowered, for a purpose described hereinafter.

The stop motion which I prefer to employ is of the ordinary character, and in connection therewith I use a combination of devices, hereafter described, by which the motion of the cams, Jacquard apparatus, and take-up rollers may be instantly arrested, and thus be prevented all injury to the work, owing to a continuance of the motion of these parts after the belt has been shifted onto the loose pulley of the driving-shaft.

The stop motion consists of a bent rod or wire, m, fig. 1, hung to one arm of a lever, m', and extending over the lathe and breast-beam Q.

To the opposite arm of the lever m' is connected, by means of a cord, a pawl, m², which is hung to a bell-crank lever, R, operated by an arm, R', of the cam-shaft in such a manner as to throw the pawl forward in the direction of the arrow, fig. 2, on every revolution of the said cam shaft.

So long as the shuttle-thread remains entire the bent wire m will be drawn forward by the same, and the pawl m² will be consequently raised, as shown on figs. 1 and 3.

Should the thread become broken, however, the wire will remain at rest, so that when the pawl is pushed forward it will strike and move a sliding bar, S, in the stationary frame, which bar so operates two levers, S¹ and S², figs. 3 and 4, as to throw the end of the spring-bar T, to which the belt-shifter T' is attached, out of the notched end of the slot p, on which it had been previously held.

The belt-shifter will be consequently turned in the direction of the arrow, fig. 4, so as to shift the belt from the fast pulley p¹ onto the loose pulley p² of the driving-shaft.

The devices connected to the above stop-motion for instantly and simultaneously stopping the cams on the cam-shaft, the Jacquard, and take-up rollers, form an important feature of my invention, and are as follows:

The side lever P, previously alluded to, has secured to it an adjustable block, q, the inclined edge q' of which is struck by a projection, q², of the sliding bar S when the latter is moved in the direction of its arrow, fig. 2.

The outer end of the lever P is connected by a cord or strap to one arm of a short lever, r, fig. 5, the opposite arm of which is similarly connected to a bell-crank lever, r', and the latter is attached to

a spring rod, s, to which the clutch-lever s' is secured.

These several devices so operate together that when the side lever P is depressed, in consequence of the breaking of a thread and motion of the sliding bar, the clutch F', before alluded to, will be disengaged from the end of the sleeve F, so that the latter and its cams may remain stationary, while the shaft D continues to revolve until its momentum is overcome. (See fig. 6.)

In operating upon the Jacquard the side lever P not only stops the motion of the barrel or axis X, which carries the pattern-cards, but reverses the same to the extent of one-quarter or one-sixth of a revolution, according as the barrel is four or six-sided, so that when the break is repaired and the loom again started the same card may be presented to the needles and the pattern be continued uninterruptedly.

The devices by which this result is obtained consist simply of a spring lever, t, connected to the lever P by a wire, t', and arranged to press against and raise the catches u and u' from the position shown in fig. 5 to that illustrated in fig. 9, and thus reverse the motion imparted to the barrel, as indicated by the arrows.

The motion of the take-up rollers is arrested simultaneously with the stopping of the cams and Jacquard by the fixed pin e', which, when the lever P is lowered, raises the pawl k² from between the teeth of the ratchet-wheel, and thus prevents the latter from turning, the said ratchet-wheel merely moving backward and forward with the motion of the pawl k until the momentum of the lathe and crank-shaft is overcome.

Instead of the lever P the modified form of lever shown in fig. 8 may be employed.

In this case the fulcrum of the lever is changed to the point l', so that the devices described, or their equivalents, for operating the clutch and cams, are actuated by an upward instead of a downward movement of the lever.

Claims.

1. The side lever P, hung to the stationary frame at either of the points l or l', operating the sliding cam-shaft or Jacquard, or either, as set forth, and arranged to be operated by the stop motion of the loom, substantially in the manner described.
 2. The adjustable block q of the said lever, with its inclined edge q', in combination with the projection q² of the sliding bar S.
 3. The said lever P, in combination with the fixed pin l', for withdrawing the pawl k² from between the teeth of the ratchet-wheel m, and thus stopping the motion of the take-up rollers.
 4. The said lever P, arranged and operating substantially in the manner described, so as to simultaneously stop the motion of the cams, the Jacquard apparatus, and the take-up rollers.
 5. The combination and arrangement, substantially as herein described, of the cams B and B', the feathered sleeve F on the cam-shaft, and the clutch F', operated by the stop motion of the loom, as specified.
- In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. F. CROWLEY.

Witnesses:

WM. A. STEEL,
JNO. B. HARDING.