

A. HANDSCHIN & H. KUNY.

RIBBON LOOM.

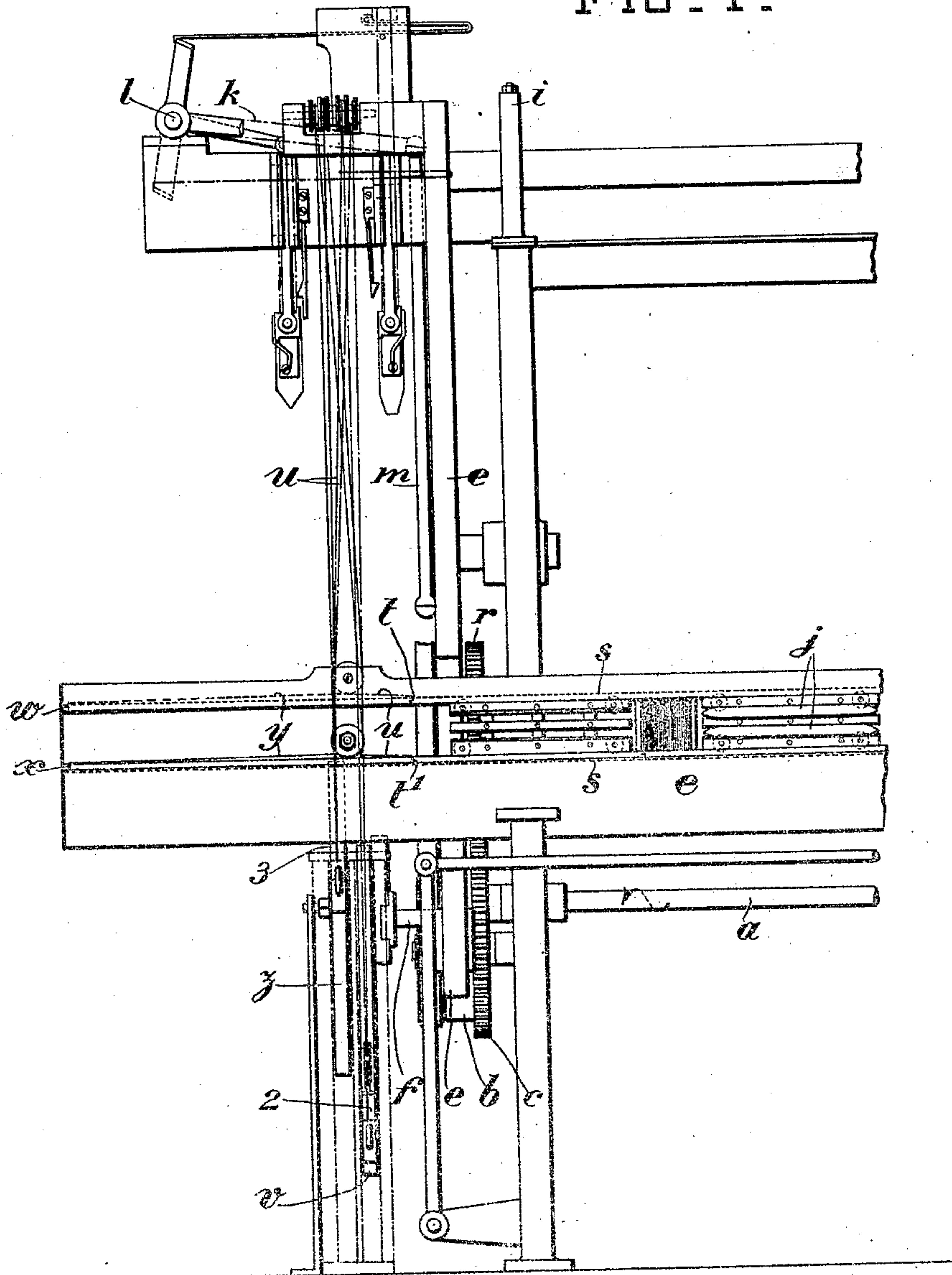
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Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

944,610.

FIG. 1.



WITNESSES:

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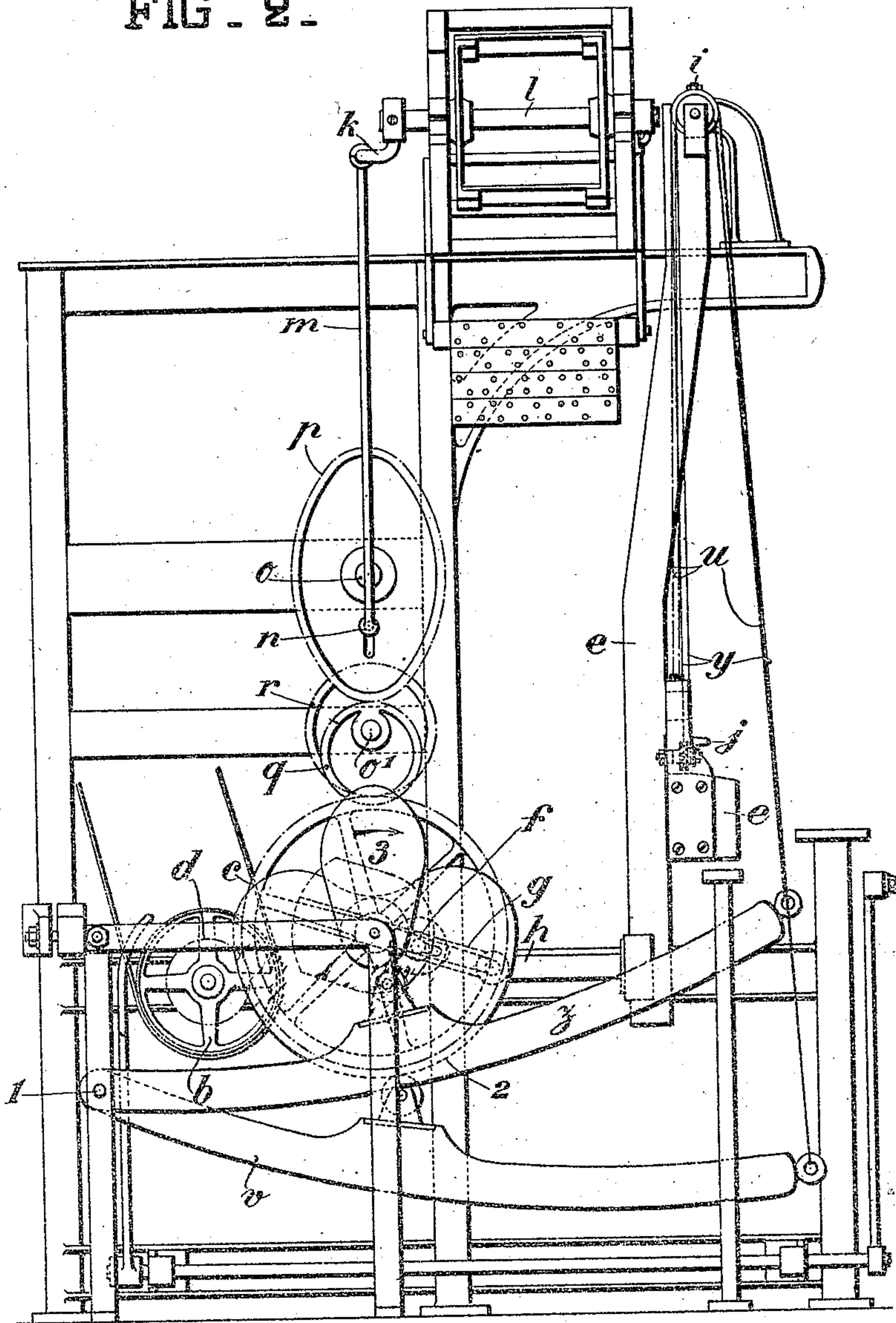
Arthur E. Hackett & Co.

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2 SHEETS—SHEET 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

ARNOLD HANDSCHIN, OF BASEL, SWITZERLAND, AND HANS KUNY, OF ST. LUDWIG, GERMANY.

RIBBON-LOOM.

944,610.

Specification of Letters Patent.

Patented Dec. 28, 1909.

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To all whom it may concern:

Be it known that we, ARNOLD HANDSCHIN, of Basel, Switzerland, and HANS KUNY, of St. Ludwig, Alsatia, Germany, both citizens of the Swiss Republic, have invented new and useful Improvements in Ribbon-Looms, of which the following is a full, clear, and exact specification.

This invention relates to a loom for weaving ribbon, particularly velvet ribbon in which the driving mechanisms for the healds (harness) and for the shuttles are so arranged with reference to that of the lay that for each stroke of the lay the shed is twice opened and the weft laid in twice. In consequence of this arrangement it is possible for our ribbon loom to work more quickly and to furnish a greater length of ribbon in a given time than the ordinary ribbon loom.

In the accompanying drawings: Figure 1 is a partial front view and Fig. 2 a side elevation of an embodiment of the invention.

The main shaft *a* of the loom is driven from the pulley device *b* by means of the toothed wheels *c*, *d*. To operate the lay or batten *e* there is an adjustable crank pin *f* on the wheel *c* which is mounted upon the main shaft *a*, and this crank pin is connected by a connecting rod *g* with the arm *h* of the lay or batten *e* which is pivoted at *i* in such a way as to be compelled to partake of its motion. Thus for each rotation of the main shaft *a* or of the wheel *c*, the lay or batten *e* executes a to-and-fro movement, that is to say a beating-up and a return stroke.

The jacquard of the loom for controlling the heddles or healds is a double acting machine of the usual type with two blades, two sets of wires and two jacquard rollers, so that its various parts need not be represented and described in detail for the present purpose. It suffices to state that the heddles or healds are attached to oscillating members connected to two horizontal rows of hooked jacquard wires alternately controlled, through the medium of two series of lifting wires, by the two jacquard rollers in such a way that each time that jacquard blade which moves forward draws with it the jacquard wires which have not been lifted by the corresponding lifting wires and thus

produces the opening of the shed. As regards its particular operation, the arm *h* of the blade shaft *l* is connected by a driving rod *m* with the crank pin *n* of an elliptical toothed wheel *p* having its pivot at *o* in such a way as to be compelled to partake of its motion, and the toothed wheel *p* engages with a toothed wheel *q* mounted eccentrically upon the pin *o*¹, while a spur wheel *r* connected with the toothed wheel *q* engages with the wheel *c* mounted upon the main shaft *a* of the loom. The proportions of translation in this gear are so chosen that the blade shaft *l* of the double acting jacquard machine is swung to and fro once so that the two jacquard blades are alternately moved forward and the corresponding healds or heddles are actuated to open the shed twice, in accordance with the pattern determined by the cards of the jacquard, at each revolution of the main shaft *a* of the loom, or at each working stroke of the batten or lay. Indeed, as will be seen from the drawing, the diameter of the wheel *c* is double that of wheel *r*, and the number of teeth of *q* is half that of *p*, so that at each rotation of the main shaft *a* the elliptical toothed wheel *p* is turned once and consequently each jacquard blade is swung to and fro once and the shed thereby twice opened.

As will be seen from Fig. 1, the batten or lay *e* is a so-called double batten *i. e.* a batten with two rows of shuttles *j* lying one above another. The shuttles *j* of each row are moved to and fro in their paths in the known way by means of a toothed rack *s* moving to and fro. The toothed racks *s* for the two rows of shuttles are connected at *t* and *t*¹ respectively with a treadle *v* by means of two ties *u* secured to them at those points and shown by dotted lines, these ties being carried upon rollers, both upon the batten itself and at the points of suspension of the latter. The said racks are similarly connected at *w* and *x* by two ties *y* (indicated by full lines) secured to them at those points with a treadle *z*, these ties being carried on rollers on the batten in a direction opposite to that of the ties *u*, and above also over rollers. These treadles *v*, *z* are articulated to the framing of the loom at 1 and have an alternate up and down motion im-

parted to them by the action of two cams 2, 3. The cams 2, 3 are mounted directly upon the main shaft α of the loom. They have a different shape of so to speak complementary form and are so arranged relatively one to another than when one treadle (z for example in Fig. 2) is at its highest point, the other treadle is held at its lowest position by its own cam, with the result that the shuttles of both rows stand at one end of their stroke, and upon reversal of the position of the treadles are carried to the other end of their stroke. Thus at each rotation of the main shaft α from which a stroke of the batten or lay results the treadles v and z are each alternately moved up and down once by the cams 2 and 3, which together with the treadles v and z , and the parts combined with them represent the driving mechanism for the shuttles, acting positively in every sense so that the shuttles of the two rows are simultaneously moved once to and fro, so as to lay in two shots on each occasion, the arrangement being so contrived that the motion of the shuttles in one direction follows immediately upon one of the two openings of the shed brought about for each stroke of the batten by the jacquard driving mechanism, and the moving of the shuttles in the reverse direction immediately after the second opening of the shed.

The driving of the double action jacquard machine by means of the elliptical toothed wheel p has the advantage that the healds are so actuated that the shed is rapidly opened and closed upon each occasion, and every time affords a proportionately long open condition of the shed, so that all contact of the shuttles with the threads of the warp is prevented.

What we claim is:

1. In a ribbon loom, the combination with healds, shuttles and a lay of a driving mechanism for the said lay and driving mechanisms for the said healds and shuttles adapted to open and shed twice and to lay the weft in twice for each to-and-fro movement of the lay.

2. In a ribbon loom, a main shaft, a lay, healds and shuttles, a device actuated from the said main shaft to give to the lay a to-and-fro movement at each revolution of the said main shaft, and devices operated by this latter to actuate the shuttles and healds twice at each revolution of the main shaft.

3. In a ribbon loom, a main shaft, a lay, healds, shuttles and shuttle drivers, a device actuated from the said main shaft to give to the lay a to-and-fro movement at each revolution of the said main shaft, two cams mounted on said main shaft, two treadles arranged respectively so as to be operated by these cams and connected to the shuttle

drivers, said cams being so arranged relatively to one another that at each revolution of the main shaft they may produce a to-and-fro movement of the shuttles, a blade jacquard machine for controlling the healds, a driving mechanism for the said jacquard machine actuated from said main shaft and connected to the blade shaft of the said jacquard machine, said driving mechanism being so constructed that at each revolution of the main shaft said blade shaft may be operated so as to open twice the shed.

4. In a ribbon loom, a main shaft, a device actuated from this latter to drive the lay, two cams mounted on said main shaft, two treadles arranged respectively so as to be operated by these cams and connected to the shuttle drivers, said cams being so arranged relatively to one another that at each revolution of the main shaft they may produce a to-and-fro movement of the shuttles, a double blade jacquard machine, a drive gear for this latter actuated from said main shaft and connected to the blade shaft of the jacquard machine, said drive gear comprising a driving toothed wheel upon the main shaft, a driven toothed wheel connected by a crank pin and rod to the blade shaft of the jacquard machine and an intermediate gearing connecting said toothed wheels so as to transmit motion from the driving wheel to the driven wheel in such a manner that at each revolution of the driving wheel upon the main shaft the said driven wheel may be rotated once and thus cause the blade shaft of the jacquard machine to swing to-and-fro with the result that the shed is twice opened, substantially as hereinbefore described.

5. In a ribbon loom, a main shaft, a device actuated from this shaft to drive the lay, two cams mounted on said main shaft, two treadles arranged respectively so as to be operated by these cams and connected to the shuttle drivers, said cams being so arranged relatively to one another that at each revolution of the main shaft they may produce a to-and-fro movement of the shuttles, a double blade jacquard machine, a drive gear for this latter actuated from said main shaft and connected to the blade shaft of the jacquard machine, said drive gear comprising a driving toothed wheel upon the main shaft, an elliptical driven toothed wheel connected to the blade shaft of the jacquard machine, an intermediate spur wheel intermeshing with said driving wheel and having half a diameter thereof, and an eccentrically mounted intermediate toothed wheel firmly connected to the first intermediate wheel, gearing with the said elliptical driven toothed wheel and of which the number of teeth is half that of this latter wheel, so that at each revolution of the driving wheel upon

the main shaft the said driven wheel may be rotated once and thus cause the blade shaft of the jacquard machine to swing to-and-fro with the result that the shed is twice opened by a rapid opening movement and with a relatively long open condition, substantially as hereinbefore described.

In witness whereof we have hereunto

signed our names this 19th day of October 1908, in the presence of two subscribing witnesses.

ARNOLD HANDSCHIN.
HANS KUNY.

Witnesses:

GEO. GIFFORD,
AMAND RITTER.