No. 748,084. PATENTED DEC. 29, 1903.

P. & E. LEROUX.

PILE FABRIC LOOM.

APPLICATION FILED APR. 30, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

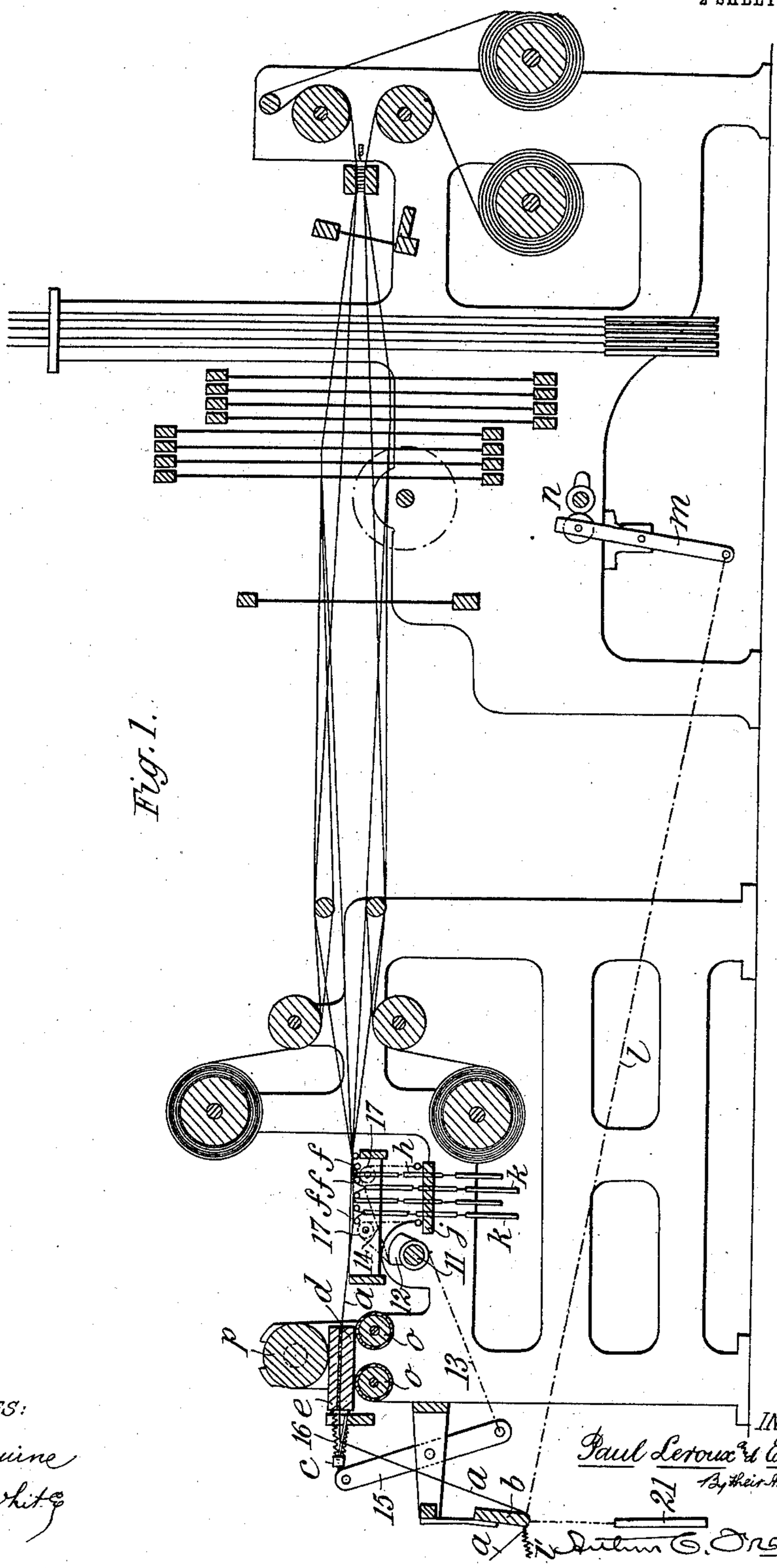

Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

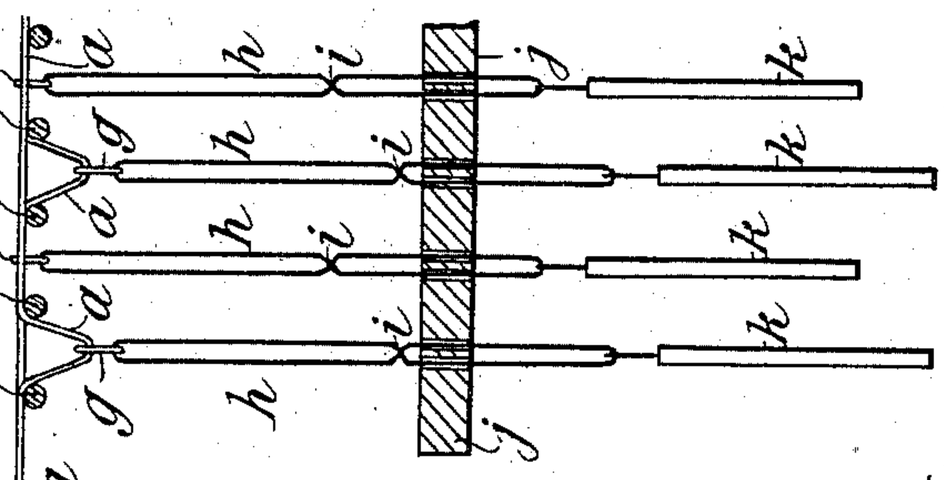


Fig. 2.

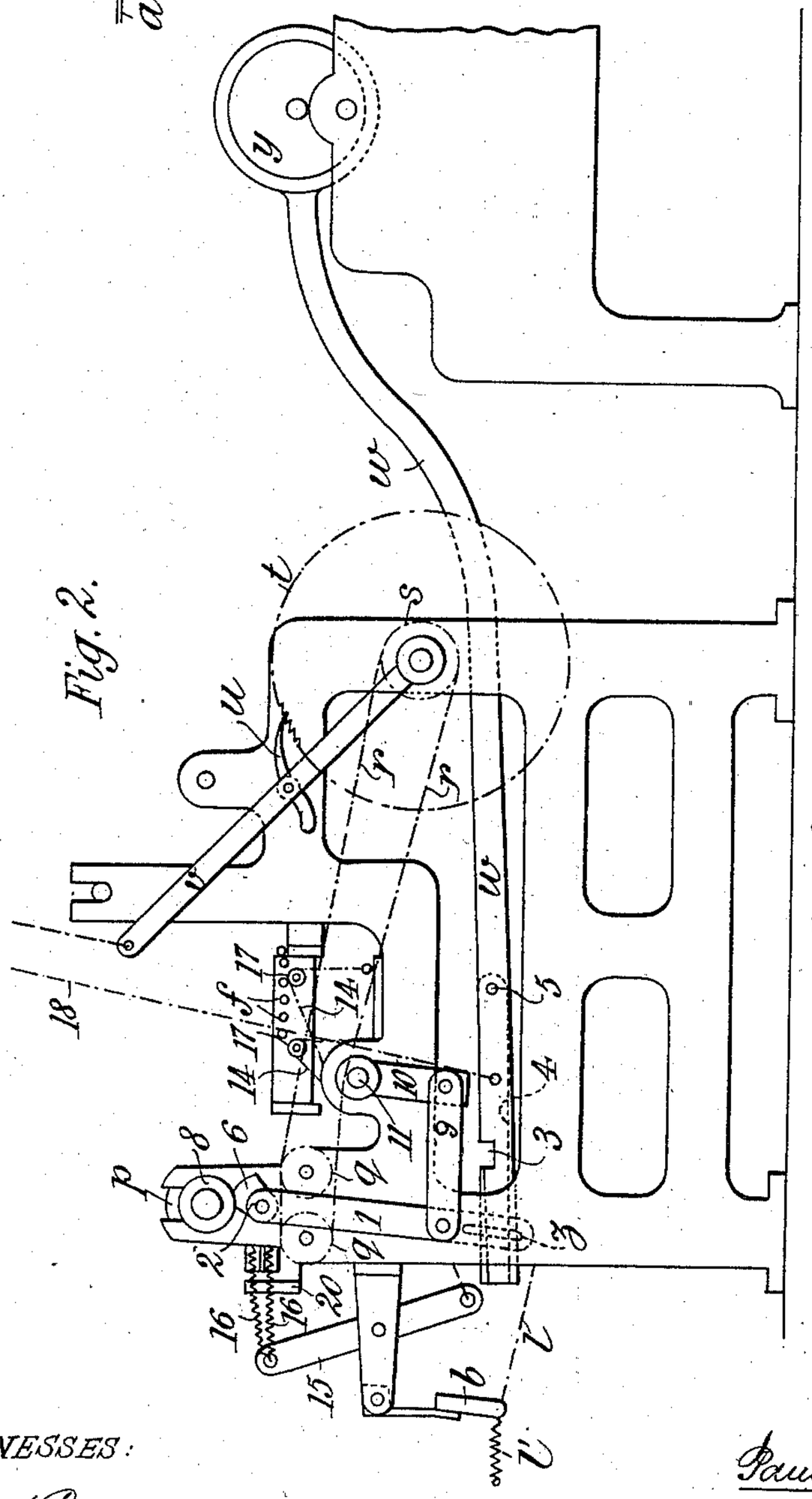


Fig. 4.

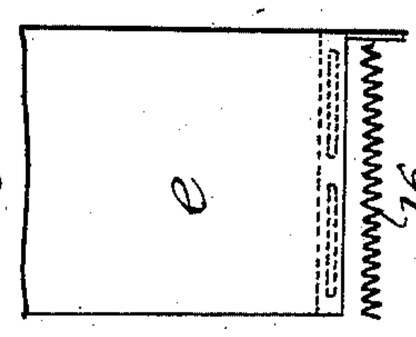
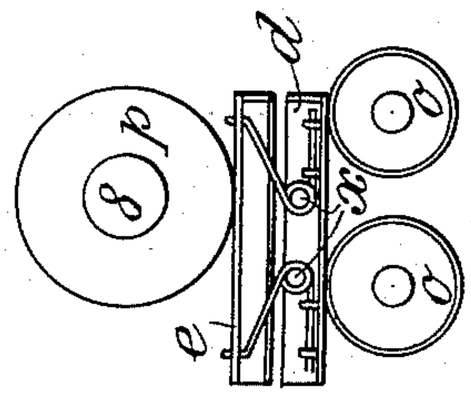


Fig. 3.



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No. 748,084. Patented December 29, 1903.

UNITED STATES PATENT OFFICE.

PAUL LEROUX AND EDMOND LEROUX, OF ROUBAIX, FRANCE.

PILE-FABRIC LOOM.

SPECIFICATION forming part of Letters Patent No. 748,084, dated December 29, 1903.

Application filed April 30, 1902. Serial No. 105,313. (No model.)

To all whom it may concern:

Be it known that we, PAUL LEROUX and EDMOND LEROUX, citizens of the Republic of France, and residents of Roubaix, (Nord,) France, have jointly invented certain new and useful Improvements in or Connected with Looms for the Manufacture of Face-to-Face Pile Fabrics, of which the following is a specification.

The improvement which we have effected in looms for weaving face-to-face pile fabrics consists of a special system of feeding the warp-threads which form the pile. These pile-warp threads are gripped between the two parts or members of a press which receives a number of successive advancing movements, during which the pile-warp threads are kept in tension at the rear of the press by weights acting upon them and in front of the press by other weights which cause the loops of the pile-threads not used to form pile to be lengthened. After a certain number of picks or successive advancing movements of the press, the parts or members of which move apart and release the pile-threads, all the pile warp-threads being released the longer or shorter loops which are in advance of the press are raised to the general or normal level or stretch of the series of pile-threads and the lengths of thread thus relieved or slackened and which would otherwise lie loose or float are taken up by the descent of the weights which act at the rear of the press, thus regulating the series or stretch of pile-threads throughout its entire extent from the reels to the lay.

Such is the characteristic feature of our new loom, which we will now proceed to describe with reference to the annexed drawings.

Figure 1 is a longitudinal section of a loom for weaving face-to-face pile fabrics arranged in accordance with our invention. Fig. 2 shows the mechanism for driving the parts of the apparatus. Figs. 3 and 4 show in end view and plan, respectively, the two boards or plates forming the press which feeds the pile-threads. Fig. 5 is a detail showing a number of the auxiliary pile-warp healds hereinafter described, which healds form the magazine or reserve for the pile-warp threads which do not act.

The threads *a*, which are to form the pile upon the fabrics, are drawn from reels on which they are wound by a bar *b*, which regulates their length before their passage into the holes of a plate *c*, whence they pass between two boards or plates *d e*, which form a kind of movable press for feeding the pile-threads necessary for the formation of the fabrics. Each of the threads *a* then passes over a rod *f*, Fig. 5, then into one of the eyes *g* of a series of auxiliary pile warp-healds, and thence over a second rod *f* before passing to the main healds of the loom. Each eye *g* is connected to a double thread *h*, the two members of which are knotted at *i*. Below these knots the separate members of the thread pass into holes formed in a vertically-movable board or plate *j*, and they carry tension-weights *k*. The regulator-bar *b* is pivoted to the frame of the machine, as shown, and has a regular oscillating motion imparted to it through the medium of a retracting-spring *l'* and a strap *l*, fixed to the lower end of a rocking-lever *m*, actuated by a cam *n*.

The press above referred to is composed substantially of two boards or plates *d* and *e*, the lower of which, *d*, is smooth and rests upon two operating-cylinders *o*, while the upper one, *e*, which is covered with cloth, exerts pressure upon the pile-threads, which pass over the other plate *d* under the action of a heavy roller *p*, free to turn in its bearings.

The feed of the pile-threads which have to coöperate in the formation of the figured fabrics is effected by the advance of the boards *d e*, which are operated by the cylinders *o*, carrying chain-wheels *q q*, driven by a chain *r*, which is set in motion by a chain-wheel *s*, mounted on the same shaft as a ratchet-wheel *t*, which moves round a certain distance at each pick under the action of a pawl *u*, carried by a rocking lever *v*, connected to a hook of the jacquard mechanism.

The threads *a* which form pile are taken exactly of the length which has been given by an advancing motion of the press, while those which do not act to form pile descend under the action of the weights of the auxiliary pile-warp healds, Fig. 5, and these threads, which form a magazine or reserve, are returned to the old reserve when the two boards *d e* move apart under the action of

springs x in consequence of the upper cylinder p being raised. The mechanism which lifts the cylinder p at same time causes the board or plate j to rise, which latter serves to lift the weights k and permit the weights 21 to return to the old reserve the pile-threads which have not acted. This mechanism can be driven in any suitable way—for example, as shown in Fig. 2 of the annexed drawings. Upon one of the shafts of the loom and at one side thereof is mounted an eccentric y, which actuates a bar w, the free extremity of which rests in a transverse ring z, fixed to a lever 1, pivoted at 2. The bar w is provided with a notch with which corresponds another notch of the same shape 3, formed on a small bar 4, pivoted at 5 upon the large bar w. On the other side of the loom is arranged another lever 1 not having a ring z, and these two levers each carry at their upper extremities a cam 6, which acts below each journal 8 of the heavy roller p. The levers 1 are connected, on the other hand, by links 9 with rocking levers 10, mounted on a shaft 11, passing across the loom. At each extremity of this shaft is keyed a cam 12, on which are fixed cords or chains 13 14 14. The cord 13 actuates a rocking lever 15, at the upper end of which are attached coiled springs 16, which form a yielding connection between the lever 15 and the plates d and e to draw back the boards or plates d and e at the desired moment. The other cords 14 14 pass over rollers 17, fixed to the support of the rods f, and their free ends are fixed to the plate j, which they thus hold suspended. In this combination of loom the press formed by the two boards or plates d and e instead of returning to its place after each pile-pick is moved toward the fabric by the cylinders o o during several picks of pile, according to the kind of article to be made. After weaving two, three, four, or more picks, according to the goods, the jacquard mechanism lifts the cord 18, attached to the bar 4, which rises when its notch 3 has passed the ring z. The eccentric y then causing the bar w to move back, the notch 3 engages or catches the ring z and the two levers 1 are together moved or rocked toward the front of the loom by means of the links 9, levers 10, and shaft 11. In this movement the cams 6 lift the heavy cylinder p. The boards d and e which are thus released, move apart under the action of the springs x and are returned backward by the springs 16 until they come against stops fixed to the board 20. At the same moment the cords 14 are pulled, lifting the board or plate j, the holes of which coming against the knots i lift the threads h, which are thus relieved of the load of the weights k. The threads a, which have formed longer or shorter V's in the auxiliary pile-warp healds—according as they have operated once or twice for four advancing motions of the press, for example—then return automatically to the old reserve under the action of the weights 21, slipping over the lower board d. The threads a all pass under the edge of the bar b, which by its backward-and-forward movement regulates the lower point of the angle formed by the threads. The heavy cylinder p being away from the cams 6, brings the two plates d and e together again to grip the pile-threads, and the sequence of movements is now again at the starting-point.

We claim—

1. In a mechanism for feeding pile-warp threads for weaving pile fabrics, the combination of a device for gripping the threads, means for giving the same a progressive advancing movement, a tension device in advance of said gripping device acting on each thread to take up the slack of those threads which are not caught by the weft, and a tension device in the rear of said gripping device.

2. In a mechanism for feeding pile-warp threads for weaving pile fabrics, a device for gripping and advancing the threads comprising in combination upper and lower plates between which the threads run, a roller p for depressing the upper plate, actuating-cylinders upon which the lower plate rests, and means for giving said cylinders movement to advance the plates and threads while the upper plate is depressed.

3. In a mechanism for feeding pile-warp threads for weaving pile fabrics, a device for gripping and advancing the threads comprising in combination upper and lower plates between which the threads run, a heavy roller bearing on the upper plate for depressing the same, means for advancing the plates and threads while the upper plate is depressed, springs tending to lift said upper plate, and mechanism controlled from the jacquard for lifting said roller to permit said springs to lift said upper plate.

4. In a mechanism for feeding pile-warp threads for weaving pile fabrics, the combination of a device for gripping the threads, means for giving the same a progressive advancing movement and a tension device for taking up the slack of those threads which are not caught by the weft comprising healds having eyes through which the threads pass, transverse rods at the sides of said healds over which the threads pass, and weights carried by said healds to draw the threads which are not caught down in the form of loops between said rods.

5. In a mechanism for feeding pile-warp threads for weaving pile fabrics, the combination of healds for taking up slack in said threads, each of said healds being formed of a loop of two threads tied together at an intermediate point, a vertically-movable plate below said intermediate point and having separate holes through which the threads of said healds pass, whereby all said healds may be lifted at once to release the slack taken up and permit the same to be drawn back.

6. In a mechanism for feeding pile-warp threads for weaving pile fabrics, a tension de-

vice for taking up the slack of those threads which are not caught by the weft, means for releasing such slack, and tension-weights arranged to draw back the slack thus released.

7. In a mechanism for feeding pile-warp threads for weaving pile fabrics, the combination of tension-weights arranged to draw thread from the reels, and means for equalizing the lengths of thread accumulated comprising a transverse bar and means for moving the same forward at each beat up of the lay.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

PAUL LEROUX.
EDMOND LEROUX.

Witnesses:
ALFRED C. HARRISON,
NOËL DHULRT.