

R. & J. DANTZER.
WEAVING LOOM.
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1,127,601.

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2 SHEETS—SHEET 1.

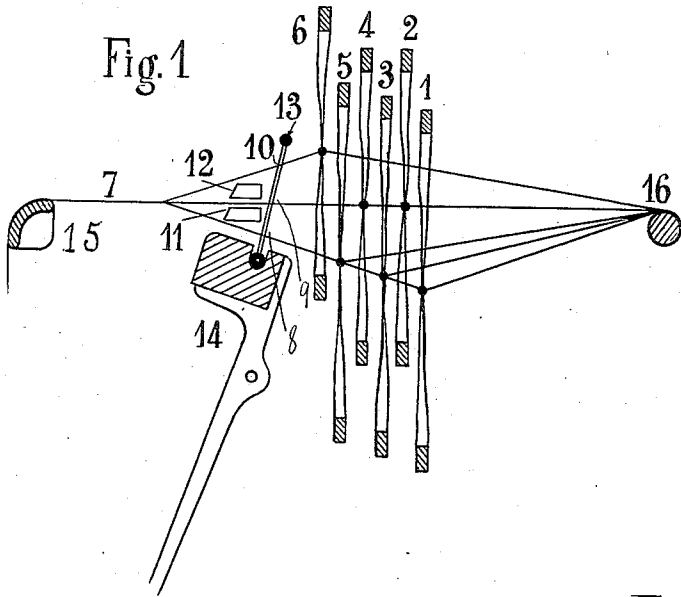
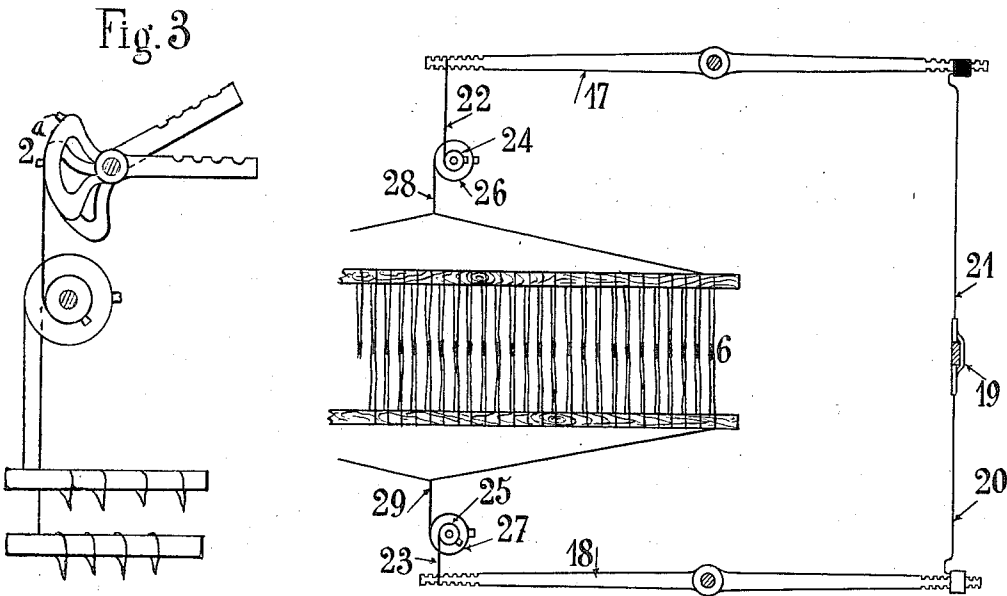


Fig. 2



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UNITED STATES PATENT OFFICE.

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WEAVING-LOOM.

1,127,601.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, ROBERT DANTZER and JAMES DANTZER, both citizens of the French Republic, residing at 85 Rue Brûle Maison, Lille, in the Department of Nord, France, have invented a new and useful Improved Weaving-Loom, of which the following is a specification.

The present invention relates to a loom for weaving weft-pile fabrics. It may also be used for weaving "double-faced" fabrics, known as "1 to 1 wefts"; in such fabrics, as in the class of pile fabrics above indicated, there are contiguous weft threads which can be shot simultaneously. Accordingly, in this novel loom, the desired effect is produced by causing two shuttles to be simultaneously shot through two superposed sheds of a single warp.

It may be pointed out that pile fabrics may be produced in two ways entirely distinct one from the other, the one method producing what are known as "warp-pile" fabrics, the other producing "weft-pile" fabrics. Looms for making warp-pile fabrics are constructed to weave two separate tissues simultaneously, one closely superposed upon the other and the two connected by the warp threads, a knife or cutter attached to the loom and reciprocating to and fro parallel to the fabric surfaces but at right angles to the plane of the warp threads serving to cut apart the two fabrics, of which the severed warp threads form the pile. Such looms commonly employ two shuttles shot independently and each weaving one of the separate tissues. Weft-pile fabrics on the other hand consist of a single fabric woven on the warp threads and having all or part of the weft threads projecting above them in the form of loops, which are eventually cut open in a subsequent operation by a knife working parallel to the warp threads to form the pile. Looms for this purpose have hitherto usually employed one shuttle at a time. In the present invention, the warp is divided into a plurality of sheds, and a plurality of shuttles are shot simultaneously through the said sheds.

The general arrangement of the loom need not be described in detail as it is otherwise similar to the ordinary weft-pile weaving looms. It is only necessary to describe the special accessory parts which effect the production of the double shed and also the simultaneous throwing of the shuttles. As

usual in looms of this type this last mentioned movement is under the control of a safety device consisting of a double shuttle controller and a double weft-break indicator.

The invention is illustrated in the accompanying drawing as follows:

Figure 1 shows diagrammatically one arrangement of the novel double shed loom. Fig. 2 diagrammatically illustrates the method of actuating the heddles. Fig. 3 is a detail view of a modified suspension arrangement, and Fig. 4 illustrates diagrammatically the novel arrangement of the shuttle boxes and cooperating mechanism.

In Fig. 1 the arrangement of a double shed is illustrated in which the shafts are numbered from 1 to 6, the woven fabric being indicated at 7. These shafts can occupy either of the three positions 8, 9 or 10. The two shuttles 11 and 12 passing into the sheds are guided laterally along the reed 13 and rest upon the lay 14. The fabric is taken up over cross member 15 which serves as a guide for the fabric. From this figure it will be seen that the shafts and the reed give a greater shed height than usual in these members, and in order to reduce this shed height it is preferable to arrange the shafts having a large movement as near as possible to the reed 13.

In operation some shafts will pass from the thread line 8 to 9 and inversely from 9 to 8. All the other shafts will pass from the position 8 to 10 and then inversely from 10 to 8. This operation will be applicable only to certain patterns possessing a very small degree of warp-repeat, and more particularly to weft velvets. In corded velvets (corduroy) for instance, the so called foundation threads form the lower shed, and the so called binding threads which secure the pile weft threads occupy alternately the positions 8 and 10. Under these conditions the same method of control is retained for the shafts forming the simple shed. In the case of the shafts having a double motion it will be necessary to insert between them and their controlling mechanism, an arrangement which will increase the distance through which they pass.

In Fig. 2 a multiplying construction is illustrated adapted to a control on the "Woodcroft" system, much used in cotton velvet weaving. In this construction, the shafts of the simple shed are held directly

between the top jack 17 and the bottom jack 18 attached to a treadle bar 19 by means of tension rods 20 and 21; the treadle bar 19 lies in a vertical plane and is actuated by a treadle. In the case of the high shed shafts, the straps 22 and 23 are fastened to the rollers 24 and 25. These run loose on pivots fixed to the frame and are provided with small pulleys 26, 27. On these latter the cords 28 and 29 secured to the shaft 6, wind and unwind. The diameters of the rollers relative to the pulleys, being for instance in the ratio 1: 2, the path traversed by the shaft thus arranged will be double that of a shaft fixed directly to the jacks. This multiplying system is very simple and easily adapted to looms controlled by cams as shown in Fig. 3, the pulleys being interposed between the shaft 1^a and its sector 2^a. In the same sense, that is to say retaining the usual method of control to the shafts of the simple shed, it is possible to operate the shafts having a high shed by means of special eccentrics.

As already explained, the two shuttles shot simultaneously across the width of the warp each pass into one of the two sheds formed in the said warp, being separated merely by the thickness of the middle line of the shed. During the passage across the loom, the upper shuttle rests on the lower one, that is to say, during this period the two shuttles form practically one.

In all looms having multiple shuttles hitherto known, the shuttles are then separated on arriving in a box. For this purpose the boxes are formed double, the two superimposed compartments being separated by a sheet of metal. This construction allows a certain play in the vertical direction to assist the lower shuttle to enter its compartment; whence the need of a lower shed of greater height in order to bring the middle line of the shed into the plane of the separating metal plate. To this extra strain on the warp is added difficulty in controlling the operation of the shuttles.

Fig. 4 illustrates the novel construction of boxes according to the present invention, which avoids the use of a separating plate. In this drawing, 11 and 12 indicate the two shuttles resting wholly one upon the other at the end of the box (with the pickers removed). No plate or sheet of metal is used to separate these two shuttles which are thus in the exact position of action. In order to guide these shuttles and so that the shuttle 12 in arriving alone at the box cannot place itself obliquely, the lower shuttle 11 presents an oblique front. The same form is shown for the shuttle 12 for the reason it is desirable to have only one kind of shuttle in use, but of course the shuttle 12 could be made with parallel sides. The adjustable members 15^a and 16^a have a cor-

responding shape. Owing to the trapezoidal section of the shuttles and their corresponding boxes said shuttles are perfectly guided and further, shuttle 12 cannot enter obliquely into the box, as this shuttle rests upon the upper part of the member 15^a forming a guide. With the shuttles arranged in this manner the regulation of the sheds is considerably simplified. It is merely necessary to make sure that the middle line of threads corresponds to the plane of the top of the shuttle 11. As in ordinary looms, the side members 15^a and 16^a must be capable of adjustment to allow the amount of braking of the shuttles to be regulated. For this purpose these side members must be mounted on the base plate 17 by means of long bolts such as 18. The shuttles are thrown by well known means, that is to say by a horizontal picker stick or by a vertical picker stick. In the first case two pickers are arranged on the usual type of slay. These pickers if necessary are held apart by means of a leather stop so that they may act simultaneously on the two shuttles. According to the position of the slay when the shuttles start the lower picker will be slightly longer than the corresponding upper picker. Although this tapered form of the shuttles adapts itself to this new method of weaving and allows these members to enter their respective shed better, it is nevertheless needful to reduce considerably the adhesion of 12 upon 11. The pressure of the two shuttles on the threads which lie in the middle, is considerably reduced by scooping out the contact surfaces. Each of the shuttles acts upon a movable tongue 19^a, 20^a secured in the usual manner to the pin 21^a of the rear plate 22. These tongues act as stops and form a brake for the shuttles. They act by means of feelers *a* and *b* on two independent shafts *c* and *d* fixed beneath the reed. Arms on these shafts arranged in the same plane are adapted to engage a stop *A*. In order to reduce the complication of apparatus on the loom and to facilitate the control, the two weft-break indicators instead of being independently mounted, are arranged on the same supporting member. This detail may be seen from Fig. 4. The two forks 1^c and 2^c are pivoted on shaft 3^c. These superposed forks cannot act one upon the other as the oscillation of 1^c is limited by the stop 4^c; in the usual manner they may enter the teeth of a single bar mounted in the plane of the reed. The hammers or hooks of these forks are actuated by an oscillating lever, 5^c, 6^c pivoted at 7^c. A separating plate 8^c of parabolic shape may, for instance, prevent the wefts from entangling one with the other and thereby impeding the actuation of the apparatus. This plate is fixed, and may be screwed on the neighboring temple or on a pin mounted on the breast-beam. The ac-

tion of the plate is insured by using shuttles having their eyelet beneath in the case of the lower shuttle, and on top in the case of the upper shuttle.

5 What we claim is:—

1. In a double shed weaving loom, the combination of a single warp, a selection of heddles carrying threads from said warp, jacks connected directly to said heddles, 10 means for operating said jacks, a second selection of heddles, means connecting said jacks indirectly to said second heddles whereby the said heddles will be displaced a greater amount than the ends of the jacks, 15 and means for shooting two shuttles simultaneously through the sheds.

2. In a double shed weaving loom, the combination of a single warp, a set of heddles carrying threads from said warp, jacks 20 connected directly to said heddles, means for operating said jacks, a second set of heddles carrying warp threads, a second set of jacks, double pulleys intermediate of the second set of heddles and the 25 second set of jacks, means connecting said double pulleys with the heddles and jacks

respectively, whereby the heddles move a greater distance than the ends of the jacks, means for operating said jacks, and means for shooting two shuttles simultaneously 30 through the two sheds.

3. In a double shed weaving loom, the combination of a single warp, a set of heddles carrying threads from said warp, jacks 35 connected directly to said heddles, a second set of heddles carrying warp threads, a second set of jacks; double pulleys intermediate said second set of jacks and the second set of heddles; cords connecting said pulleys with said jacks and heddles respectively, 40 means for operating said jacks, and means for shooting two shuttles simultaneously through the two sheds.

In testimony whereof we have signed our names to this specification in the presence 45 of two subscribing witnesses.

RT. DANTZER.
JAMES DANTZER.

Witnesses:

CHARLES MERCHEZ,
GUSTAVE ALBRECHT.