

No. 798,472.

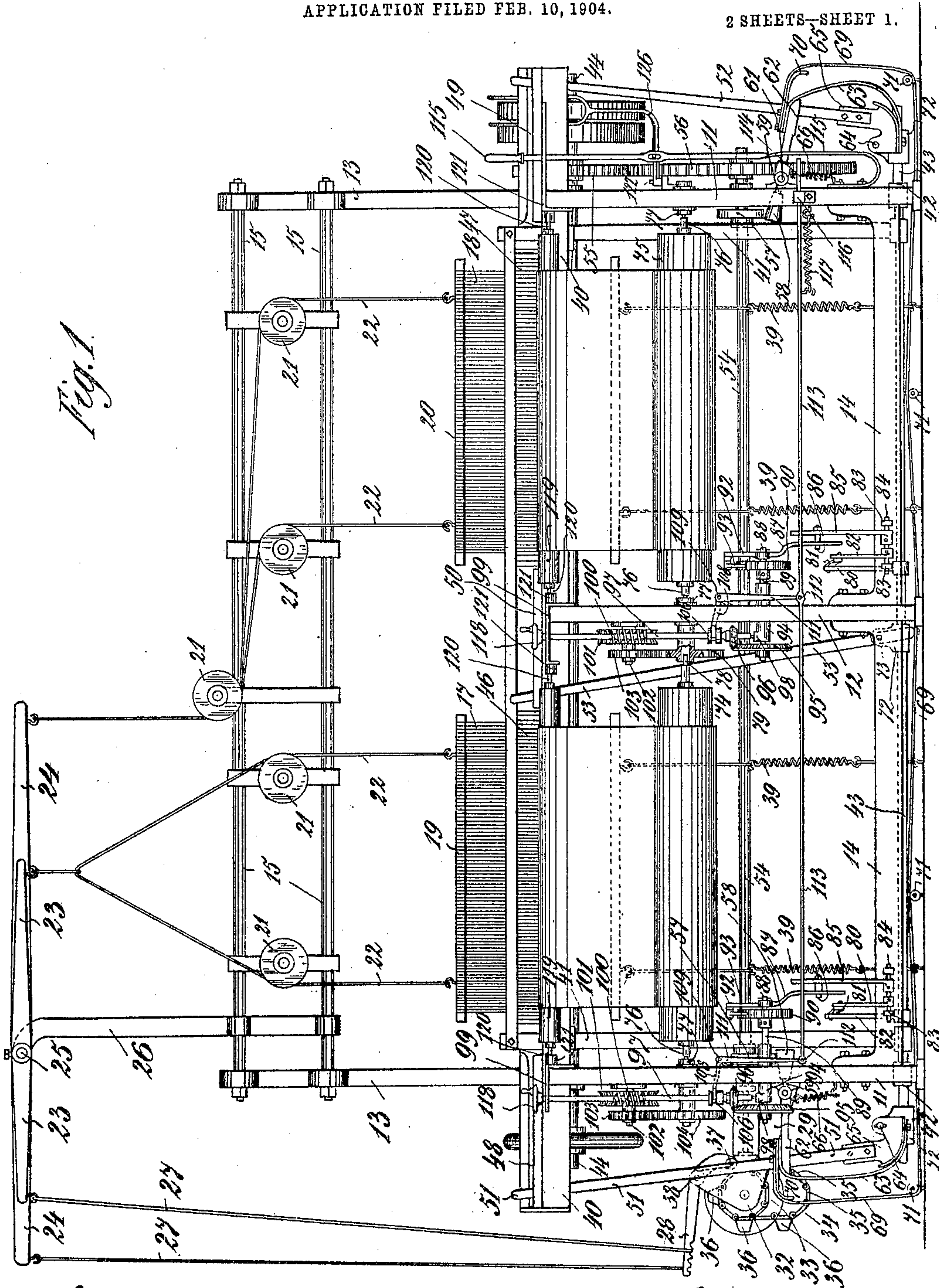
PATENTED AUG. 29, 1905.

C. WILMSEN.

POWER LOOM FOR PRODUCING SEVERAL FIRM BORDERED TISSUES SIDE
BY SIDE.

APPLICATION FILED FEB. 10, 1904.

2 SHEETS-SHEET 1.



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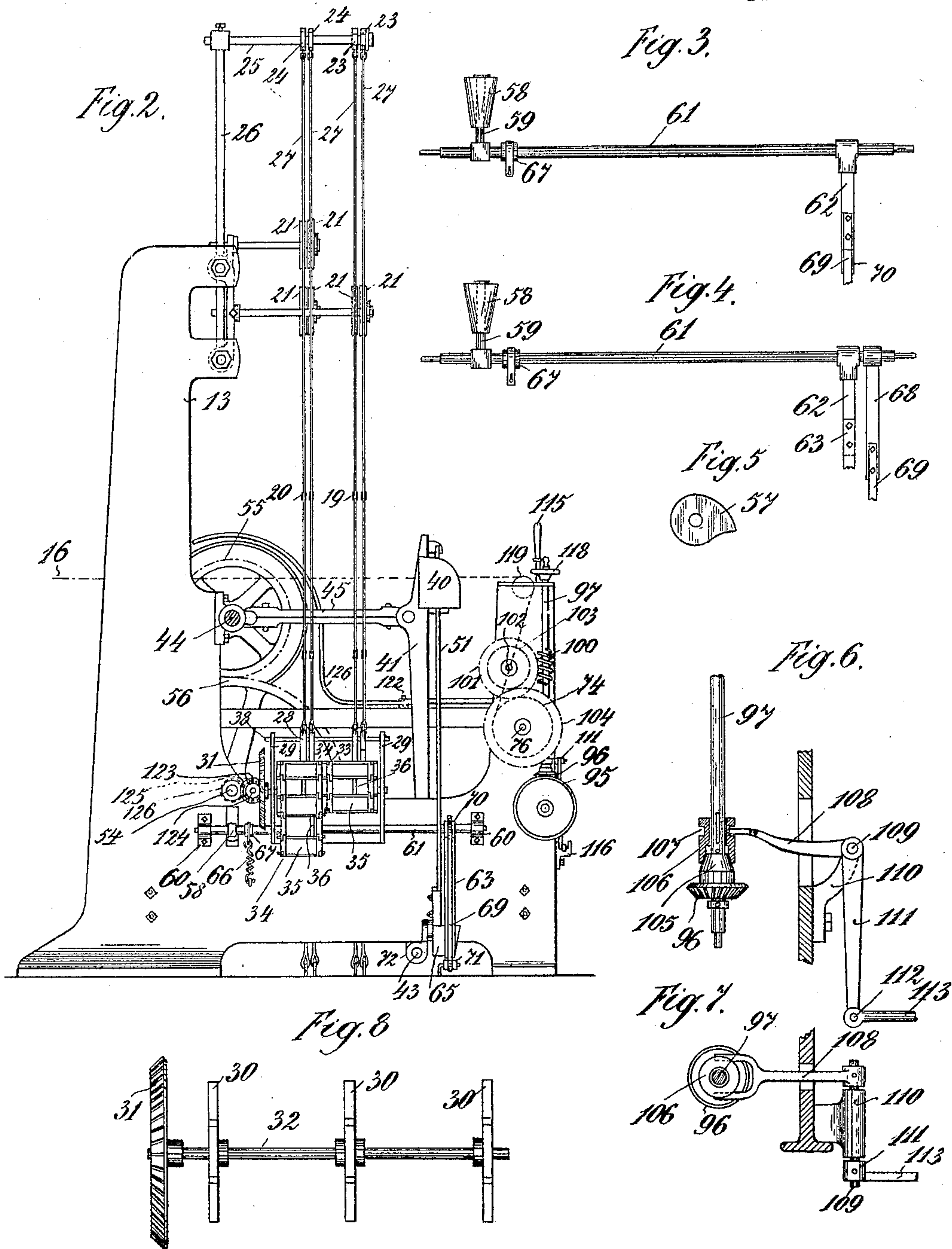
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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POWER-LOOM FOR PRODUCING SEVERAL FIRM-BORDERED TISSUES SIDE BY SIDE.

No. 798,472.

Specification of Letters Patent.

Patented Aug. 29, 1905.

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To all whom it may concern:

Be it known that I, CONRAD WILMSEN, a subject of the German Emperor, and a resident of Viersen, Rhine Province, Germany, have invented certain new and useful Improvements in Power-Looms for Producing Separate Parallel Webs, of which the following is a specification.

The subject of the present invention is a power-loom for producing several webs or tissues side by side of a total breadth which the shuttle-stroke of the ribbon-loom now in use would not permit of. Hereby the shuttle-threads are not only firmly tied in the borders of the tissues, but also the different tissues selected independently of each other with regard to warp and weft. For this purpose there is arranged in a common frame a cloth-beam for each tissue, and each beam has a separate winding device; but all the winding devices are connected with the disengaging-lever of the loom. Moreover, each warp passes separately through shafts, and the lay or batten of the loom receives as many reeds as the number of tissues to be produced. The reeds may therefore be more or less compact. The number of shuttles used depends on the number of tissues to be woven. For the purpose of throwing the shuttles through the sheds formed by the warp-threads, in addition to the picking-levers at the side of the loom, a central oscillatory picking-lever is provided between the tissues. These picking-levers are, however, actuated in a peculiar manner by only two mechanisms arranged on both sides of the loom, the same as with an ordinary broad loom. No importance, however, is to be attached to the construction of the different mechanisms, for all the known constructions in this respect may be employed in this loom.

The drawings illustrate a sample construction of the invention.

Figure 1 is a front view of a loom for producing two tissues; and Fig. 2, a side view of the same as seen from the left, the fly-wheel on the main shaft and the warp-beam frame being omitted. Figs. 3 to 8 are details of different mechanisms on an enlarged scale, Fig. 3 being a view of a picking-shaft, Fig. 4 a beater-shaft with a different distribution on the lever-arms on the same, Fig. 5 a picking-eccen-

tric, Figs. 6 and 7 details of the winding device in a front view and plan, respectively, and Fig. 8 a detail of a dobby-machine.

Similar numbers refer to similar parts throughout the several views.

The front part of the frame of the loom consists of the two side frames 11 and a middle frame 12. On the middle frame the superstructure 13, shown on the side frames 11, may be omitted. The frames are united by cross-bolts and cross-bars. The back part of the frame of the loom which receives the warp-beams is not shown in the drawings, as it possesses no peculiar features distinguishing it from the known frames in which several warp-beams are arranged side by side. It is presumed that the warp-threads (indicated at 16 in Fig. 2) come from a back part of known construction. They run in the front part of the frame through the heddles 17 and 18 from the harness-shafts 19 and 20, which are suspended, as shown in Fig. 1, in the usual manner—for instance, by means of cords 22 passing around rollers 21 from one end of the tumblers 23 and 24. The number of shafts arranged behind one another may vary considerably. In the drawings only two are shown. The tumblers 23 and 24 oscillate around a bolt 25, held by a jack 26, adjustably arranged on the cross-bars 15 of the frame of the loom. The outer ends of the tumblers 23 and 24 are connected by cords 27 with the cam-lever 28 of the dobby.

The particular construction of the dobby is immaterial. In the sample construction illustrated there is journaled an axle 32 in a jack 29, affixed to one of the side frames 11, and this axle is provided with pulleys 30 and a bevel-wheel 31 and is driven by one of the shafts of the loom. Fig. 8 shows the axle 32 and its accessories on a larger scale. Over the pulleys 30 there are placed side by side two card-chains 33 and 34, which are respectively composed of a greater or less number of cards 35. In the drawings the chain 34 is longer than the chain 33. Over the respective cards 35, generally made of wood or cast-iron, there are distributed lifting-cams 36, according to the number of cross-threads desired, which are set to act on turning the axle 32 upon the rollers 37 at one of the ends of the levers 28, oscillating around the bar 38, fas-

tened in the jack 29. The levers 28, actuated by a lifting-cam 36, effect through the described connection a lifting of the respective shafts 19 and 20; while the levers 28 not influenced remain in the position shown in the drawings, and the shafts 19 and 20 belonging to the same are held down by springs 39. From the above it can be seen that the movements of the shafts 19 are independent of those of the shafts 20.

The lay or batten 40 of the loom is mounted in the usual manner by its arms 41 upon an axle 43, resting in the bearings 42 in the lower part of the frame of the loom, and receives vibrating motion by means of the connection-rods 45 from the main crank-shaft 44, whose bearings are in the frame of the loom. The lay or batten has two reeds or slays 46 and 47 working independently of each other. The batten has further on either side shuttle-boxes 48 and 49 of the same type as those of ordinary broad looms. In the middle between the two reeds 46 and 47 there is arranged another shuttle-box 50. Into every shuttle-box there projects in the usual manner the upper end of an oscillating picking-lever 51, 52, or 53, the object of which is to drive a shuttle through the warp-shed. In the present case two shuttles are used, of which the one is to pass a thread of the weft through the tissue to be woven on the left and the other through the one on the right. Both shuttles are moved at the same time—namely, at one time—from the left to the right by means of the two picking levers or arms 51 and 53 and the other time from the right to the left by means of the picking-arms 52 and 53. The central picker 53 must therefore drive a shuttle at every formation of a shed. For this purpose it is connected in a special manner with the outer picking mechanisms, which themselves may be of any construction. In the illustrative construction shown in the drawings the lower driving-shaft 54, journaled in the frame of the loom and rotated by means of the toothed wheels 55 56 by the main or crank shaft 44, carries at each end a picking-eccentric 57 of the usual type shown in Fig. 5. The two eccentrics 57 are placed opposite each other at an angle of one hundred and eighty degrees for alternate action. They actuate conically-shaped rollers 58, mounted on arms 59 of shafts 61, oscillating horizontally in bearings 60 at the side of the respective frames 11. From the arms 62 of the shafts 61 belts 63 lead to the quadrants 65, turning on studs 64, to which quadrants the pickers 51 and 52 are screwed. The studs 64 are affixed to boxes 72, provided with lappets, which are keyed onto the axle 43 of the batten of the loom secured in any other manner on the axle 43. The picker-shafts 61 are actuated by springs 66, hooked on the one side to the frame of the

loom and on the other into a strap on a socket 67 on the respective picker-shafts, and work in such a manner that the rollers 58 always tend to press against the eccentric 57. The two shafts 61 or arms 68, Fig. 4, on the same are moreover connected by a belt 69 with the central picking-lever 53. Instead of a special arm 68 the arm 62 of the shaft 61 may be used to transmit the motion to the central picking-lever 53 by screwing upon the arm 62 or the strap 63, fastened to the same, an adjusting-iron 70, as shown in Fig. 3. To the adjusting-irons 70 on either side are then fastened the ends of the belt 69, which runs over and under guiding-rollers 71, arranged on the floor to the central picking-lever 53, and is fastened to the same not far from its pivot 73. The pivot 73 rests on a box 72, affixed to the axle 43 of the batten of the loom and is provided with a fish-plate.

In consequence of the above-described transmission of motion from the shafts 61 to the picking-levers 51 and 53 or 52 and 53 the energy of the several picking-levers can be accurately regulated. In order to assure, especially with looms working at a great speed, the synchronism of the movements of the picking-levers 51 and 53 and 52 and 53 and cause them to drive the shuttles with an equal energy, it is necessary that the picking-lever 53, being at a greater distance from the actuating picking-shafts, should be driven at a higher energy than the picking-levers 51 and 52, which are nearer the shafts, so as to overcome the force of inertia and equalize any greater extensibility in the transmitting medium. The adjusting-irons 70 may be affixed adjustably on the arms 62 in order to be able to change the length of the lever-arms more easily. Another characteristic feature of the loom is that there are on it two cloth-beams 74 and 75 independent of each other, whose journals 76 are mounted in bearings 77 of the frame of the loom, while the journal 78 may turn in the hollow nave of the toothed wheel 79. Each beam 74 and 75 is connected with a winding device, which may be constructed after any known system. In the drawings each winding device consists of a lever-arm 80, mounted on the axle 43 of the batten of the loom, flexibly connected with a lever-arm 82 through a drawing-rod 81, the lever-arm 82 being affixed to a bar 84, resting in bearings 83 on the cross-bar 14. On this bar 84 is also mounted a so-called "catch-lever" 85, which engages, by a pin 86, a slot in a catch-lever 87. The latter is mounted loosely on the axis 88 of the axle 89, which carries the ratchet-wheel 90. This ratchet-wheel is engaged by a pawl 93 on the lever 87. The axle 89 of the ratchet-wheel is journaled in a box 94, screwed to the frame of the loom, and carries on the other side of the box a beveled

wheel 95, which engages a beveled wheel 96 of an upright shaft 97. The upright shaft 97 may be journaled in a step-bearing 98 of the box 94 on the one side and a plate 99, screwed at the top to one of the lateral frames 11 and the middle frame 12. The upright shaft 97 carries an endless worm 100, which engages a worm-wheel 101, running loosely upon a stud 102, screwed to the frame of the loom. The worm-wheel 101 is connected with a spur-wheel 103, the said spur-wheels gearing, respectively, with the spur-wheel 104 upon the pivot of the beam 74 and with the spur-wheel 79 on the pivot of the beam 75 to drive the two winding devices.

As the axle 43 of the batten oscillates the cloth-beams are turned step by step by the above-described mechanism. The speed for winding up the two beams 74 and 75 may be different, as each beam has its special winding device. One of the tissues may therefore be very close in warp and weft and the other much looser. Furthermore, in one of the tissues the weft may be very fine and in the other very thick. In other words, the character of one of the tissues to be produced may be altered *ad libitum* without affecting in any way the other tissue.

As soon as the loom ceases to work the winding devices must be disengaged simultaneously to allow of moving with the hand the main shaft of the loom without winding up any material. For this purpose the beveled wheel 96, which with each of the two winding devices is arranged on the upright shaft 97, is mounted loosely on this shaft and carries one-half (105) of a coupling adjustable on the upright shaft 97. Figs. 7 and 8 illustrate this part of the winding device on an enlarged scale. In an annular groove 107 of the adjustable half of the coupling 106 engages in the usual manner a forked lever 108, whose axle 109 has its fulcrum in a bearing 110, screwed to the frame of the loom. Upon this axle 109 is arranged a second lever 111, provided with a pin 112. With the pins 112 of the levers 111 of the two winding devices engages the bar 113, whose end reaches up to the arresting-lever 115 of the loom, which lever is acted on by a spring and in the usual manner by means of a lever 126, forked at one end and turning on a pivot 122 on the frame of the loom, shifts the driving-belt to the loose or fixed pulley. On the right lateral frame 11 of the loom there is a bearing 116 for the end 114 of the bar 113. The bar 113 is, moreover, acted upon by a spring 117 in such a way that the coupling 105 and 106 between wheel 96 is closed by the same; but if the arresting-lever 115 oscillates to the left at its upper end it strikes against the end 114 of the bar 113 and opens the couplings 105 and 106 of the two winding devices. The upright

shafts 97 of the winding devices may at the upper end be provided with a hand-wheel 118 in order to be able to turn the winding devices by hand when the couplings 105 and 106 have been put out of gear.

Before the tissues pass upon the beams 74 and 75 they go in the usual manner over guiding-rollers 119, whose journals 120 turn in slot-bearings 121.

The beveled wheel 31, which is affixed to the axle of the pulley of the mechanism of the dobby-machine, is in the drawings driven by a beveled wheel 123 on an intermediate shaft 124, which latter is driven through spur-wheels 125 126 by the lower driving-shaft 54 of the loom.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a loom for weaving a plurality of firm-bordered parallel webs, the combination in a common frame of separate cloth-beams for the several webs, separate winding and coupling devices for the several cloth-beams, connections for simultaneously actuating the coupling devices from the arresting-lever of the loom, a lay or batten common to the several webs, outside picking devices for the several webs, an interposed picking-stick between the webs carried by said common lay, and suitable actuating mechanism for said outer picking devices and connections for actuating said interposed picking-stick alternately from the outer picking devices, substantially as set forth.

2. In a loom for weaving a plurality of firm-bordered parallel webs, the combination in a common frame of separate cloth-beams for the several webs, separate winding and coupling devices for the several cloth-beams, connections simultaneously actuating the coupling devices from the arresting-lever of the loom, a lay or batten common to the several webs, outside picking devices for the several webs, an interposed picking-stick between the webs carried by said common lay, eccentrically-operated picking-shafts for actuating the outer picking devices, separate belt and lever connection between the picking-shafts and the picking-sticks of the outer picking devices and between said shafts and the interposed picking-stick, substantially as set forth.

3. In a loom for weaving a plurality of firm-bordered parallel webs, the combination in a common frame of separate cloth-beams for the several webs, separate winding and coupling devices for the several cloth-beams, and connections for simultaneously actuating the coupling devices from the arresting-lever of the loom, a lay or batten common to the several webs, outside picking devices for the several webs, an interposed picking-stick between the webs carried by said common lay, eccen-

trically-operated picking-shafts for actuating the outer picking devices, levers on the picking-shafts, belts between said levers and the picking-sticks of the outer picking devices, 5 adjustable irons on said levers and belt connection between said irons and the interposed picking-stick, substantially as set forth.

The foregoing specification signed at Cre-feld, Germany, this 25th day of January, 1904.
CONRAD WILMSEN.

In presence of—

THOMAS R. WALLACE,
W. BRUCE WALLACE,
FRED. GROSSRIDERS.