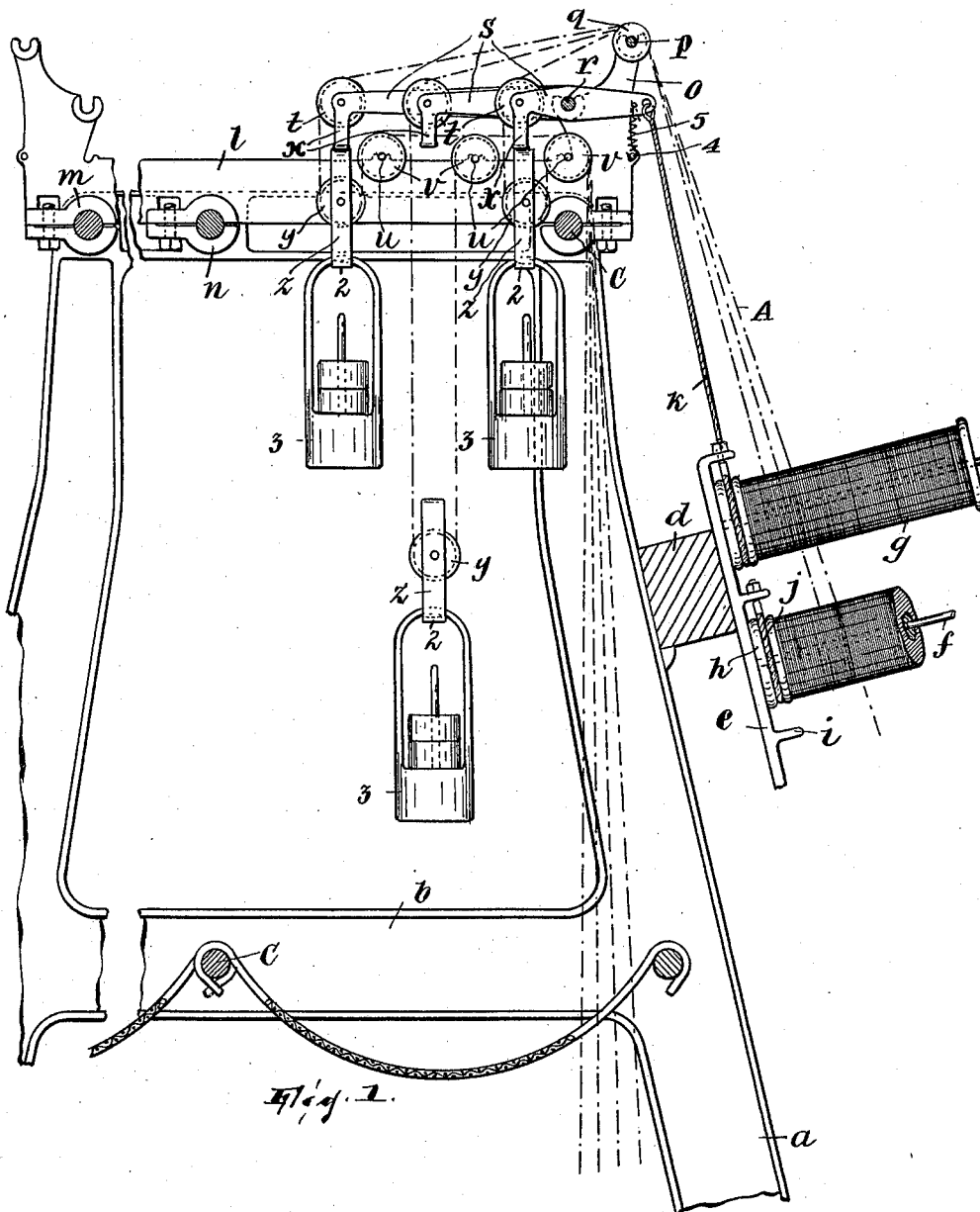


F. BENZ, JR.
LET-OFF MECHANISM FOR NARROW WARE LOOMS.
APPLICATION FILED JAN. 11, 1911.

1,001,804.

Patented Aug. 29, 1911.

2 SHEETS—SHEET 1.



WITNESSES
Wm. Bell.
Chas. Kaufmann

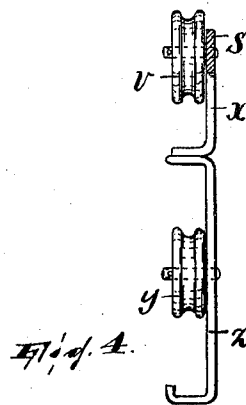
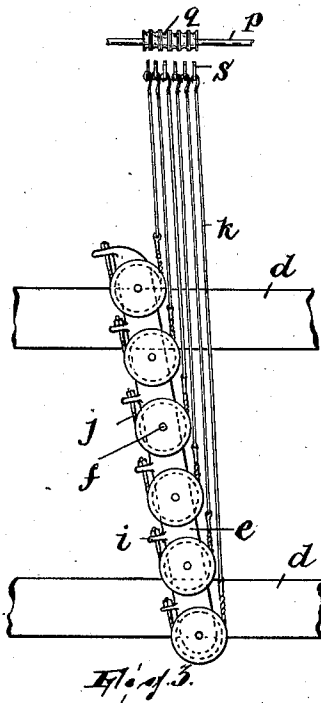
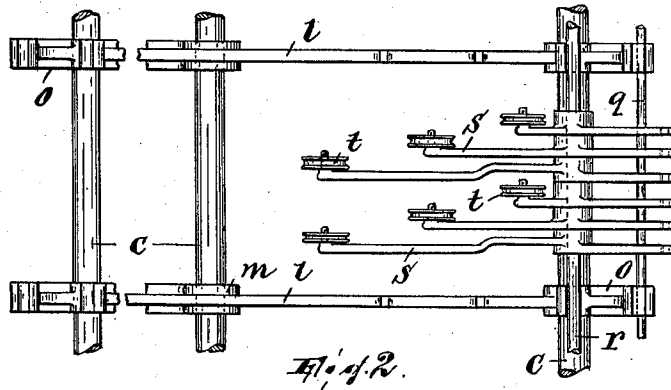
INVENTOR,
Frederick Benz, Jr.,
BY *John H. Howard*
ATTORNEY.

F. BENZ, JR.
LET-OFF MECHANISM FOR NARROW WARE LOOMS.
APPLICATION FILED JAN. 11, 1911.

1,001,804.

Patented Aug. 29, 1911.

2 SHEETS—SHEET 2.



WITNESSES
Wm. D. Bell.
Elio Kaufmann.

INVENTOR,
Frederick Benz, Jr.,
BY *John H. Howard*
ATTORNEY.

UNITED STATES PATENT OFFICE.

FREDERICK BENZ, JR., OF HALEDON, NEW JERSEY, ASSIGNOR TO JOSEPH FRANK, OF NEW YORK, N. Y.

LET-OFF MECHANISM FOR NARROW-WARE LOOMS.

1,001,804.

Specification of Letters Patent. Patented Aug. 29, 1911.

Original application filed December 17, 1909, Serial No. 533,641. Divided and this application filed January 11, 1911. Serial No. 601,946.

To all whom it may concern:

Be it known that I, FREDERICK BENZ, JR., a citizen of the United States, residing at Haledon, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Let-Off Mechanisms for Narrow-Ware Looms, of which the following is a specification.

This invention relates to looms and particularly to that kind of looms of the narrow-ware class known as "German" looms, *i. e.*, looms in which the warps are wound on normally fixed spools arranged on skewers; in this class of looms, since the warp spools do not rotate under normal working conditions, a loop is maintained in each warp by a weight, the loop affording the slack necessary to permit the take-up to be effected as the weaving proceeds. Heretofore, the supporting means for the warp supply spools has been arranged to project from the back of the loom which gave rise to certain objections which are set forth in my application for Letters Patent of the United States bearing the Serial Number 533,641 (of which this application is a division,) wherein a loom is described and claimed in which two weaving machines, forming units of a single structure, are placed back to back joined by an overhead structure which supports the warp supply spools and the means for controlling the letting-off of the warps.

One of the features of advantage of the loom referred to in my application mentioned consists in such an arrangement of the parts active in guiding the warps that the latter all lie in substantially a single vertical plane at the back of each loom unit.

My present invention consists in a means for controlling the letting-off of the warps having certain novel and advantageous features in and of itself, although the said means has been devised with particular regard to its use in connection with the loom of the application above referred to with a view to forward the advantages referred to in said application.

In the accompanying drawings, Figure 1 is a vertical sectional view of a superstructure of a loom constructed in accordance

with that shown and described in my application above referred to, illustrating the improved warp controlling means; Fig. 2 is a fragmentary plan view of what is shown in Fig. 1; Fig. 3 is a fragmentary view in side elevation of what is shown in Fig. 1; and, Fig. 4 illustrates a detail.

The superstructure *a* surmounts the back portions of two looms placed back to back as set forth in my said application, and comprises two or more upright frames *b* connected by suitable rods *c*, the sides of the said frames converging upwardly as shown and having the beams *d* resting against them and also connecting and bracing the frames. To each of these beams (of which there is an upper and a lower one secured to each side of the superstructure, although only one is shown in Fig. 1, at the right thereof) is secured a series of frames *e* provided with skewers *f* on which are placed the warp supply spools or the like *g*, each having as its base a peripherally grooved head *h*. The frames *e* are preferably disposed at an incline (viewed from the right or left in Fig. 1), as in Fig. 3, each series of spools being consequently similarly inclined. Each frame has a series of lugs *i* formed along one side thereof, and to these are attached the ends of brake devices *j* in the form of cords, straps or the like, which pass around the grooved heads *h* of the spools and have attached to them the flexible connections *k*, each such connection extending clear of the several spools owing to the incline of the latter (Fig. 3).

A plurality of brackets *l* are arranged on the rods *c* in parallel arrangement, the same having bearings *m* which fit over the rods and have bolted to them clips *n* coacting with the bearings to secure the brackets adjustably on the rods. At each end each bracket has an upwardly extending arm *o* carrying a rod *p* on which is journaled a roller or other bearing device *q* over which the warp threads *A* pass from the spools *g*. Each arm *o* also supports a fulcrum rod *r* for a set of levers *s*, each lever being fulcrumed between its ends on the rod and the inner arms of said levers in each set being preferably of different lengths. The flexi-

ble connections *k* are connected to the outer ends of these levers. In the inner end of each lever is journaled a roller or other bearing device *t* over which a warp thread 5 passes on leaving the roller *g*. On other rods *u* are journaled other rollers or bearing devices *v*, the latter being arranged to alternate with the bearing devices *t*. One of the warp threads from one of the spools 10 on the frame *e* in Fig. 1, after passing roller *g*, extends around the right-hand roller *t* and then over the right-hand roller *v*; another warp thread, after passing the roller *g*, extends around the intermediate roller *t*, 15 and then over the intermediate and right-hand rollers *v*; the third warp thread, after passing the roller *g*, extends around the left-hand roller *t* and then over all three rollers *v*. The three warps, after passing the right-hand roller *v* are then led approximately 20 straight downwardly, Fig. 1. This arrangement, wherein the upwardly extending and downwardly extending portions of the warp threads stand relatively close together 25 whereas their remaining portions form angles in effect overlying the superstructure, not only involves a compact and space-saving disposition of the guiding devices *g*, *t* and *v* with relation to the remainder of 30 the loom, but makes it possible, as will now appear, to utilize means whereby the warps are automatically let off in a perfectly uniform and regular manner.

Each lever *s* has at its inner end a downwardly extending foot *x*. Suspended in the 35 portion of each warp thread between the roller *t* and the next adjoining right-hand roller *v* is a roller *y*. This roller is journaled in a hook-shaped bracket *z* (Fig. 4) supporting in its depending foot 2 a weight 40 carrier 3; the portion of each thread between the rollers *t* and *v* last referred to is therefore held by the roller *v* in the form of a loop. The foot *x* of each lever *s* and the 45 upper end of the corresponding bracket *z* are bent off laterally as shown in Fig. 4, so that when the latter rises and engages the former a good contact will be insured. Thus, as the weaving proceeds, the slack 50 formed by the loop in each warp thread will be gradually taken up. Finally the slack becomes so reduced that, the weight rising, bracket *y* engages the foot of lever *s* and rocks the lever, thus relieving the braking 55 action of the brake *j* so that the weight falls and forms slack anew before the braking action can be reestablished. The sensitiveness of the action of the levers to cause the release of the spools when the levers are 60 shifted by the rising bracket *z* may be increased by connecting each lever with a rod 4 carried by the bracket *u* by a spring 5; this spring has the further function to re-

duce the strain on the warp represented by the weight of the lever when the bracket *y* 65 is elevating said lever, in effect balancing the lever at that time.

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

1. The combination of a supporting structure, rotary warp-supply devices arranged therein, levers fulcrumed in said structure side by side on a common fulcrum axis, movable guiding rollers carried by the several levers at different distances from the 75 fulcrum axis, fixed guiding rollers journaled in said structure in vertical planes coinciding with those of the movable rollers respectively and each nearer to said fulcrum 80 axis than the respective movable rollers, the threads being adapted to extend each from a supply device over one of the movable and then over one of the fixed rollers, other rollers each suspended in the portion of a 85 thread between each movable and fixed roller and maintaining a loop therein, weight-carrying brackets each affording a journal for one of the last-named rollers and movable upwardly into actuating engagement 90 with the corresponding lever, and braking means operatively connecting each lever with a supply-device, substantially as described.

2. In a loom, the combination of a supporting structure, a rotatable warp-supply 95 device arranged therein, three warp-guiding devices arranged all higher than the supply device and in three vertical planes, those in the vertical planes nearest and next 100 nearest to the supply device being respectively arranged higher and lower than the other guiding device, a lever projecting horizontally between the first- and second-named guiding devices and having its fulcrum 105 in a vertical plane between the third-named guiding device and the supply device and carrying said third-named guiding device on one arm thereof, a flexible brake device engaging the supply device and having 110 one end attached to the other arm of the lever, the warp being adapted to extend over the first-, third- and second-named guiding devices in the order named, and a weight suspended in the part of the warp 115 between the second- and third-named guiding devices, substantially as described.

3. In a loom, the combination of a supporting structure, a rotatable warp-supply 120 device arranged therein, warp-guiding devices over which the warp is adapted to extend after leaving the warp-supply device, a weight-carrying bracket adapted to be suspended in the portion of the warp between said guiding devices, a substantially 125 horizontal lever carrying one of said guid-

ing devices on one arm thereof and ful-
crumed in said structure, a flexible brake
device engaging the supply device and hav-
ing one end thereof attached to the other
5 arm of the lever, the weight-carrying
bracket being movable upwardly into con-
tact with and adapted to tilt the lever, and
a spring connecting the lever and said struc-
ture and tending to tilt the lever in the same

direction as it is tilted by said bracket, sub- 10
stantially as described.

In testimony whereof I affix my signature
in presence of two witnesses.

FREDERICK BENZ, JR.

Witnesses:

JOHN W. STEWARD,
WM. D. BELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents
Washington, D. C."