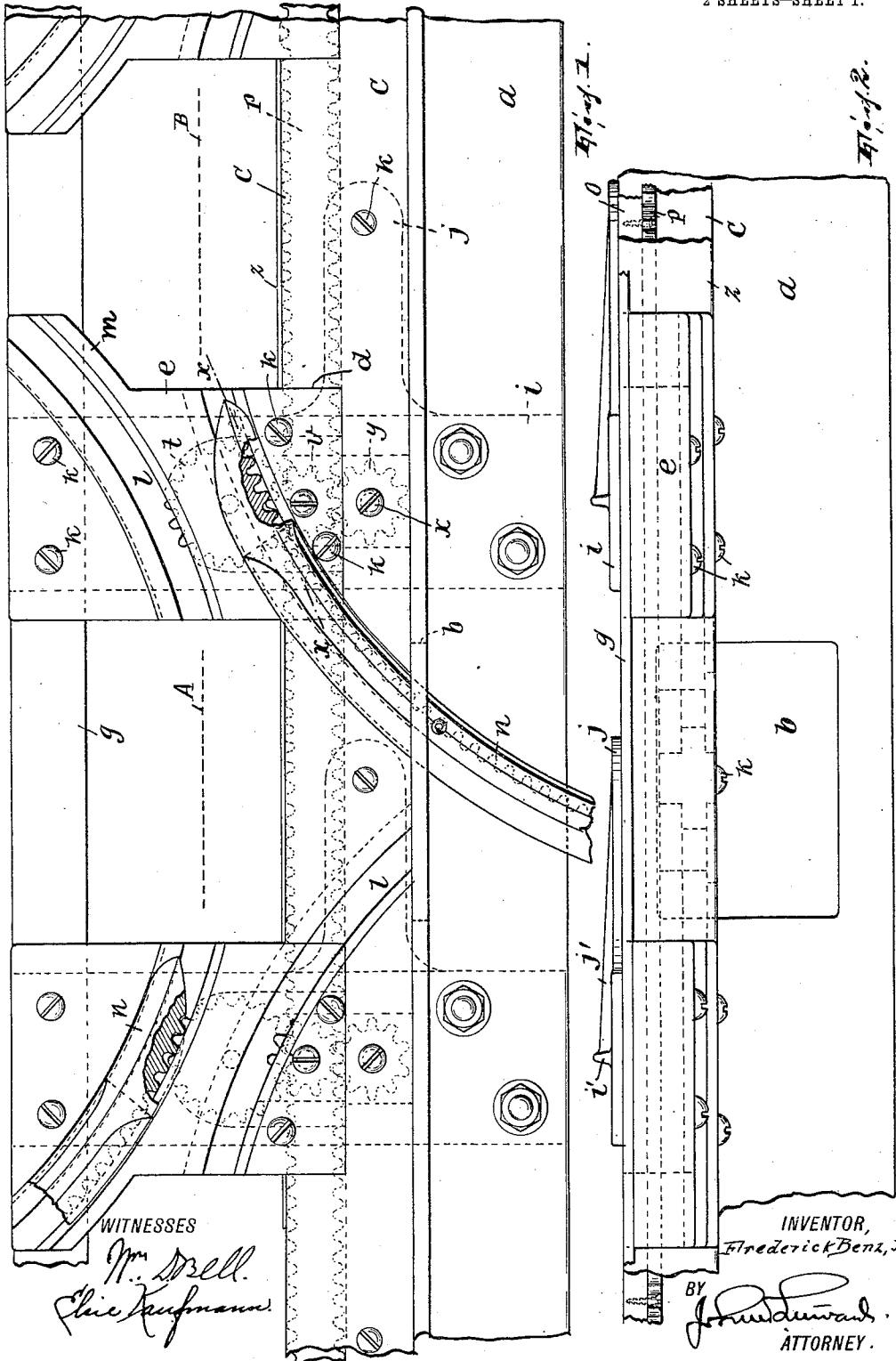


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 BATTEN STRUCTURE FOR NARROW WARE LOOMS.
 APPLICATION FILED NOV. 7, 1911.

1,050,202.

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2 SHEETS-SHEET 1.



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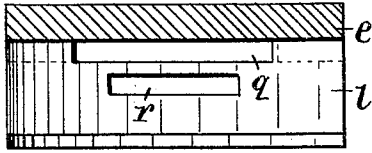


Fig. 4.

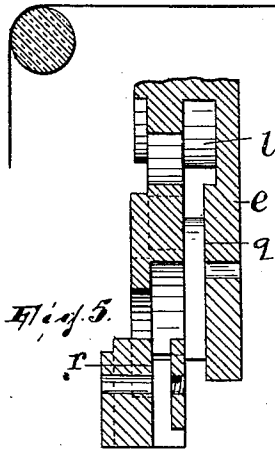


Fig. 5.

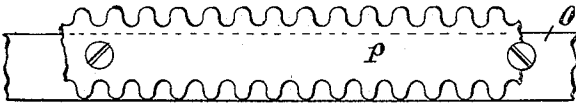


Fig. 7.

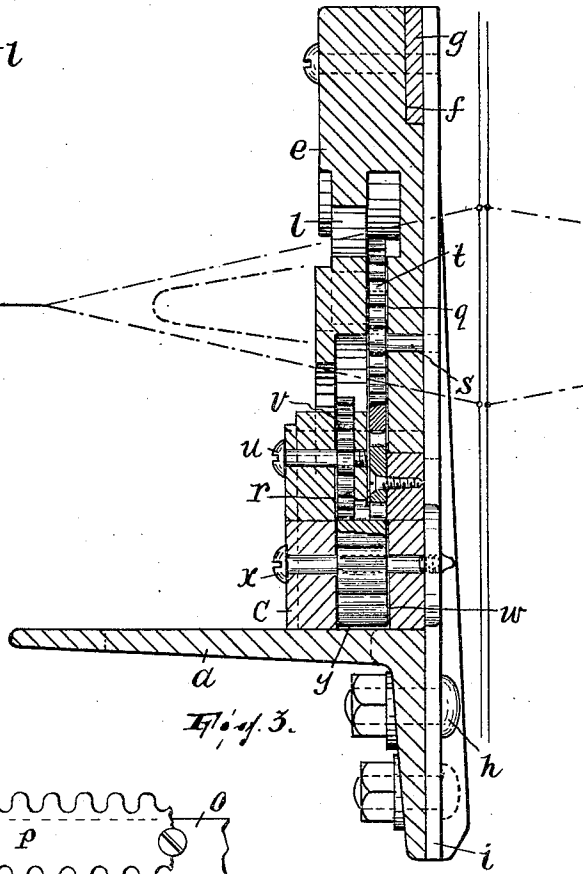


Fig. 3.

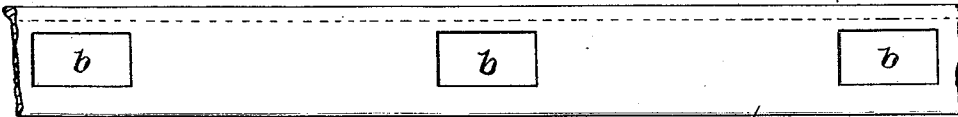


Fig. 6.

WITNESSES

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BATTEN STRUCTURE FOR NARROW-WARE LOOMS.

1,050,202.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed November 7, 1911. Serial No. 658,974.

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 Batten Structures for Narrow-Ware Looms, of which the following is a specification.

This invention relates to batten structures for narrow ware looms and particularly to batten structures of this class in which provision is made for an upper and lower series of shuttles.

By the improved construction herein set forth and in accordance with my principal object the batten structure is not only rendered more compact but the weaving may be accomplished with the weaving planes for both series of shuttles all in alinement with each other which, as is well known, is a matter of considerable advantage and convenience to the weaver.

In addition to the above-named advantages, the batten structure is rendered more substantial and durable, while the parts are so constructed and arranged that they may not only be initially set with great precision in their intended relation to each other but will be maintained in that relation substantially permanently. In view of this and because of the manner in which the power is transmitted to the shuttles, the wear and tear on the shuttles and other moving parts is more evenly distributed, so that they operate with less noise and vibration than usual and can be kept in commission for a longer period of time.

In the accompanying drawings, Figure 1 is a front elevation of a fragment of the improved batten; Fig. 2 is a plan view thereof; Fig. 3 a vertical sectional view in the plane of the axes of one of the sets of pinions; Fig. 4 is a horizontal sectional view on substantially the line $x-x$ of Fig. 1; Fig. 5 is a vertical sectional view of a fragment of one of the shuttle blocks with the moving parts removed; Fig. 6 is a plan view of the batten-proper on a reduced scale; and, Fig. 7 is a front elevation of the rack.

The batten-proper a is preferably a strip of angle iron which may be bolted or otherwise secured by its vertical (narrow) side to the lay-swords (not shown). At suitable intervals the broad (horizontal) side of the

batten-proper is formed with the openings b .

On the batten-proper a is secured a wooden rail c whose back is flush with the back of the batten-proper. At regular intervals it has rectangular recesses d cut into its top surface. Into each recess is snugly fitted the lower conforming end of a shuttle block e , the back of which is flush with the backs of the parts a and c . At their upper ends all of the shuttle blocks are formed at the back with alined rectangular recesses f , and these receive a bracing strip g , snugly fitting them.

To the vertical side of the batten-proper, and against the back thereof and bearing against rail c , each shuttle block and the bracing strip g are secured by bolts h the series of uprights i each having a lateral extension j ; the upright and its extension in each instance preferably having reinforcing ribs i' and j' as shown in Figs. 2 and 3. Screws k are employed to secure the rail c and the shuttle blocks to the upright.

In the shuttle blocks are curved grooves l forming guideways for the shuttles which are arranged in two series, upper and lower. The guideways of the upper series curve downwardly and those of the lower series curve upwardly, each block containing the relatively adjoining ends of one guideway of the upper series and one of the lower series; in short the guideways of the upper series alternate with or stand staggered relatively to those of the lower series.

It is my object to increase the space in the batten structure available for weaving as much as possible and at the same time afford ample support for each shuttle in its guideway. This is brought about by forming extensions m on the outer sides of the upper parts of each two adjoining shuttle blocks, into which extensions the guideways l of the upper series reach; and by extending the guideways of the lower series into the rail c by properly grooving the latter (Fig. 1). n designates shuttles, upper and lower series, arranged to travel in said guideways.

The arrangement and construction of the parts are such that the weaving planes A for the upper series of shuttles are or may be brought into substantial alinement with the weaving planes B of the lower series of shuttles (Fig. 1). In the movements of the

shuttles in the lower series each shuttle dips at each extreme of its movement into one of the openings *b* in the batten-proper *a*, one such opening serving for two adjoining shuttles.

5 This leads to compactness and to making it possible materially to reduce the height of the entire structure, as illustrated. Both series of shuttles have rack teeth on their under sides, as shown in Fig. 1. The
10 grooves *l* forming the upper series of guideways are set back into the shuttle blocks farther than those of the lower series.

The means for communicating motion to the shuttles will now be described. The
15 shuttle-driving rack comprises a strip *o* to the front of which is secured the rack proper *p* having teeth on its upper and lower edges, the upper teeth projecting above the strip and the lower teeth being flush
20 with its under side. The back lower portions of the shuttle blocks are cut away (Fig. 5) and the back upper part of rail *c* rabbeted (Fig. 2) to receive this rack, which rests on the rail *c* and is abutted at the
25 back by the uprights *i*. A vertical slot *q* is formed from the bottom of the block upwardly so as to communicate with the upper shuttle groove therein (Figs. 4 and 5). Forward of this slot another slot *r* is
30 formed, extending from the bottom of the block up to and communicating with the lower groove. On a pin *s* entering the block from the back is journaled within the slot *q* a driving pinion *t*, meshing with the
35 rack and adapted to mesh with the rack of the shuttle traveling in the upper groove. On the screw or pin *u* entering the block from the front and within the slot *r* is journaled the driving pinion *v* adapted to
40 mesh with the rack of the shuttle in the lower groove. It will thus be seen that both shuttles are engaged by their driving pinions at their under sides. In coincidence with the several slots *q* and *r* the rail *c* is
45 formed with vertical slots *w* in which, on a screw *x*, is journaled a broad transmission pinion *y* which meshes with the rack and the pinion *v*. This arrangement, whereby the rack, pinion *t* and the upper groove are
50 disposed in superposed relation, whereas the lower groove is disposed above the pinion *v* and said pinion derives motion through a pinion below itself and the rack, makes it possible to reduce the vertical dimension of
55 the structure and at the same time results in the pinions *t* and *v* rotating in the same direction, so that the shuttles of both series also move in the same direction. Over the rack and secured on the rail *c* a cover-strip
60 *z* is preferably placed between each two blocks to protect the warps from the teeth of the rack.

Among other advantages secured by my construction is the fact that, whereas com-
65 pactness and simplicity of construction re-

sult from driving the two series of shuttles from one rack in the manner herein set forth, the structure is as clear as possible of parts which will obstruct the light and thus produce shadows falling upon the
70 woven goods to the detriment of good weaving results being obtained.

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

1. In combination, with the shuttle blocks, a supporting structure therefor having upwardly opening recesses, the blocks being stepped in and snugly fitting the recesses, means for securing the blocks to said
80 structure, shuttles guided in said blocks, and means for driving the shuttles including a rack, the lower portions of the blocks and intervening portions of said structure being cut away in line with each other and
85 receiving the rack, substantially as described.

2. In combination, with the shuttle blocks, a supporting structure therefor having upwardly opening recesses, the blocks being
90 stepped in and snugly fitting the recesses, shuttles guided in said blocks, means for driving the shuttles including a rack, the lower portions of the blocks and intervening portions of said structure being cut
95 away at the back in line with each other and receiving the rack, and uprights arranged against the backs of said structure and blocks, substantially as described.

3. In combination, with the shuttle blocks,
100 a supporting structure therefor having upwardly opening recesses, the blocks being stepped in and snugly fitting the recesses, said blocks and said structure having their
105 backs flat and flush with each other, and uprights securing the shuttle blocks to said structure and resting flat against both of them, substantially as described.

4. In combination, with the batten
110 proper, a rail having upwardly open recesses and arranged on the batten proper, shuttle blocks stepped into and snugly fitting said recesses, and means for securing the batten proper, rail and blocks together,
115 substantially as described.

5. A batten structure comprising a continuous lower portion having upwardly opening recesses, separate upright portions projecting upwardly from said lower portion and stepped in and snugly fitting the
120 recesses thereof, and means for securing said upright portions to the lower portion, said structure having upwardly curved shuttle grooves formed each partially in one
125 of said upright portions and partially in said continuous portion, substantially as described.

6. A batten structure comprising a continuous lower portion and spaced upright
130 portions projecting upwardly from said

lower portion, said structure having in said upright portions a series of downwardly curved shuttle grooves and a series of upwardly curved shuttle grooves, the grooves of the two series alternating with each other and each groove being formed in two adjoining upright portions, and each of said two adjoining portions having a lateral extension formed on the relatively outer side thereof and containing a part of said groove and having its relatively inner side substantially straight to its upper end.

7. In combination, with the batten proper having downwardly entering openings therein, the shuttles, and shuttle guiding means having upwardly curved guideways terminating in coincidence with said openings, substantially as described.

8. In combination, with the batten proper having downwardly entering openings therein, the shuttles, and shuttle guiding means having upwardly curved guideways terminating in coincidence with said openings, each opening being common to adjoining ends of adjoining guideways, substantially as described.

9. In combination, with a supporting structure having downwardly curved upper and upwardly curved lower shuttle guide-

ways, the lowermost portion of the upper guide-ways and the uppermost portion of the lower guide-ways being substantially alined with each other, shuttles arranged in said guide-ways, a reciprocating rack arranged in said structure and having rack teeth on its upper and lower sides, a pinion meshing with one shuttle and one series of the rack teeth, a pinion meshing with the other shuttle, and another pinion meshing in common with the second-named pinion and the other series of rack teeth, substantially as described.

10. The combination, with the batten proper having uniformly spaced recesses entering its upper surface, of a shuttle guiding structure arranged on said batten proper and having upwardly curved races terminating at said recesses, shuttles in said races adapted to protrude therefrom and means for reciprocating said shuttles, substantially 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."