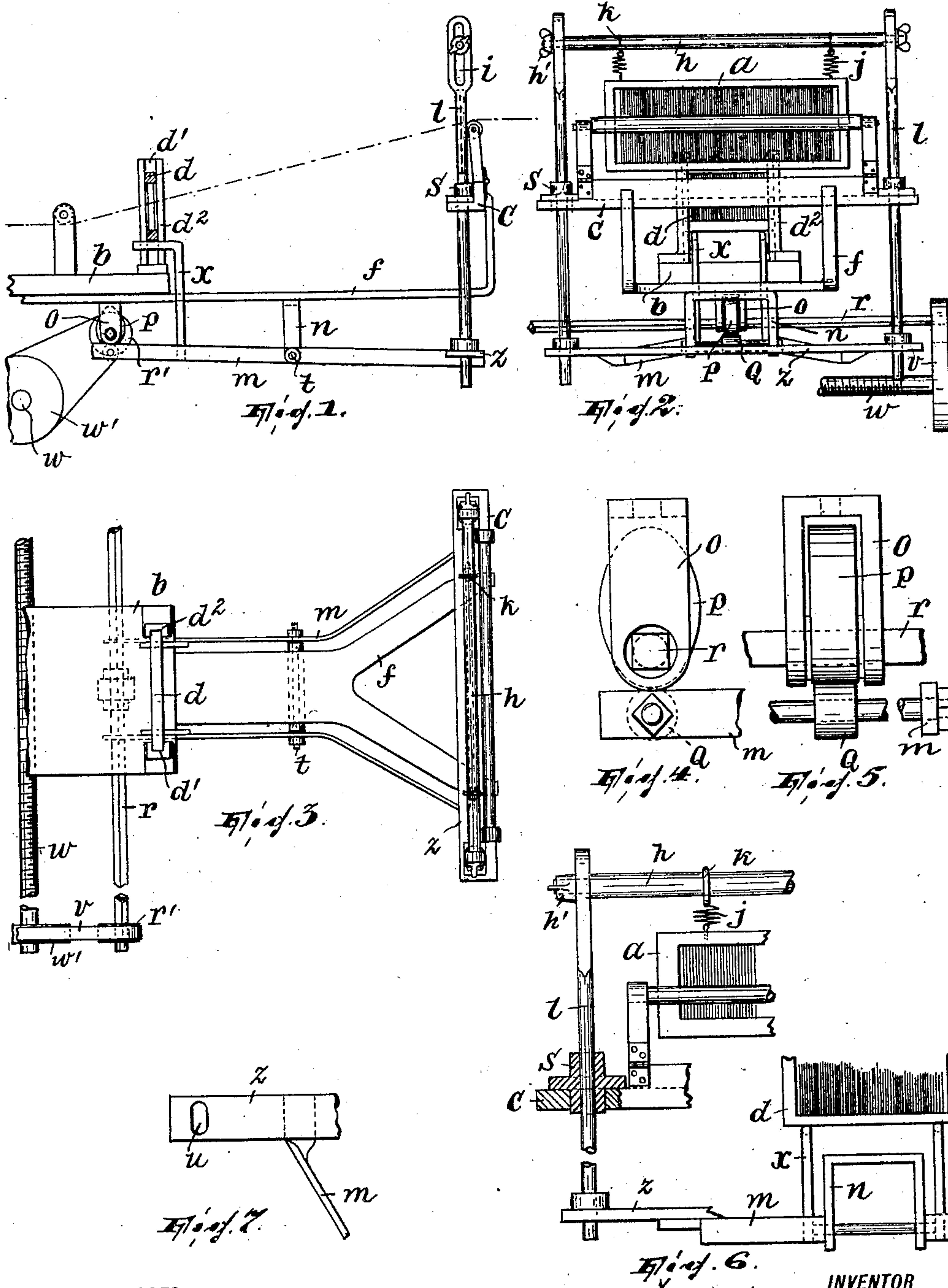


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 WARPING REED.  
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920,701.

Patented May 4, 1909.



WITNESSES

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# UNITED STATES PATENT OFFICE.

HUGH WATSON, OF PATERSON, NEW JERSEY.

## WARPING-REED.

No. 920,701.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed October 24, 1906. Serial No. 340,360.

*To all whom it may concern:*

Be it known that I, HUGH WATSON, citizen of the United States, and resident of Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Warping-Reeds, of which the following is a specification.

This invention relates to warping machines and the like and it consists in certain improvements in the means, found desirable in some types of warping machines, for effecting a movement as between the reed or reeds and the warp so that the threads will not, by constantly wearing against the same portions of the reed dents, cut nicks or grooves in the latter, with the result that the warp catches therein and becomes broken or otherwise damaged. The object of these improvements is to provide a mechanism of this character which may be operated with the expenditure of the minimum of power, will be simple and inexpensive in construction and which will effectively control both of the two reeds usually used in warping machines.

Referring to the accompanying drawing, Figure 1 is a side view of the carriage of a warping machine, and of my improved mechanism attached thereto, the reed *d* appearing in vertical section and its nearer guide being removed. Fig. 2 is a view in front elevation of what is shown in Fig. 1; Fig. 3 is a plan view; Fig. 4 is a detail in side elevation of a certain cam and a fragment of the lever structure which it actuates; Fig. 5 is a view in elevation of what is shown in Fig. 4, looking from left to right in said Fig. 4; Fig. 6 illustrates the manner of supporting the reeds, the guides *d*<sup>2</sup> for the reed *d* being removed and, Fig. 7 is a plan of a fragment of what is shown in Fig. 6.

*b* represents the carriage of an ordinary warping machine, the same comprising the usual projecting part *j* and a cross-piece *c* carried thereby; *w* is the screw commonly employed for effecting the lateral movement of the carriage.

*d* is what is commonly known as the condensing reed, the same being arranged in suitable slots on the carriage in the usual manner, except that, in the present instance, it is movable vertically in said slots *d*<sup>2</sup> in guides *d*<sup>2</sup>.

The reed *d* is supported by the inverted L-shaped brackets *x* carried by a lever structure *m* fulcrumed between its ends on a rod *t* arranged in brackets *n* suspended from the

part *f*. The brackets *x* are carried on the inner arm of the lever structure *m*, and on the outer arm of the latter is secured a bar *z* having transverse slots *u*. These slots receive the uprights *l*, which are shouldered so as to be supported by the bar *z*, and which are guided for vertical movement in sleeves *s* carried by the cross-piece *c*. Said uprights *l* have their upper ends formed with vertical slots *i*, and these slots receive the reduced ends of a horizontal rod *h*, said reduced ends being threaded and receiving wing-nuts *h'* for clamping the rod at any desired elevation in the slots.

On the rod *h* are arranged rings *k*, and suspended from these rings by means of the spiral springs *j* is the main reed *a*.

*e* is the usual horizontal glass bar suitably supported above the cross-piece *c* and adapted to sustain the warp.

In view of the foregoing it will be observed that on oscillating the lever structure on its fulcrum the reeds will be raised and lowered, moving in opposite directions; at the same time the main reed *a*, being yieldingly supported, responds to tendencies emanating from the warp and operating to displace it vertically, so that the reed will give before the warp can be damaged by it. Further, the reed being laterally movable on the rod *h*, it adjusts itself to any lateral play or change of position on the part of the warp.

The lever structure is oscillated by means of a cam *p* which slides freely laterally on a squared shaft *r*, the cam being arranged in an inverted U-shaped bracket *o* secured to the carriage so that as the carriage moves laterally the cam moves with it. The inner end of the lever structure *m* may carry a roller *Q* arranged in contact with the cam. Shaft *r* is rotated by means of a belt *v* extended around suitable pulleys *w'* and *r'* on shafts *w* and *r*.

By moving the reeds in opposite directions I avoid the undue movement which would be imparted to the warp if both reeds were moved in the same direction at once, and in addition secure a movement of the parts which is smooth and free from jar and vibration; the laying of the warp on the reel of the warping machine therefore proceeds regularly and uniformly and without undue variation in the tension thereon.

Having thus fully described my invention, I claim:

1. In a warping frame, the combination of



a cam *p*, a shaft *r* operating said cam, the lever structure *m*, a rod carried by said lever structure, a roller *Q* journaled on the rod and engaging the cam, another rod *h*, a reed 5 carried by the rod *h*, and uprights *g* carrying the rod *h* and supported by the lever structure *m*, substantially as described.

2. In a warping machine the means for supporting a reed consisting of springs and 10 rings which can slide freely on a rod, the rod *h*, the vertical sliding supports *g* having in one end of each a slot *i* for retaining the rod *h* in place and for adjusting and changing position of the reed, the bearings *s* in which 15 the uprights slide, the bar *z* with slots, in which the ends of the supports are inserted, in connection with the pieces *m* which are fulcrumed to the bracket *n*; and the cam operated automatically from the carriage 20 screw as set forth for the purpose of raising and lowering the reed automatically and the carriage screw as set forth and described.

3. In a warping machine the combination between the reed *a*, the springs and sliding 25 rings supporting the same, the rod *h*, in the slots in the vertical pieces *l*, and the vertical pieces sliding in the bearings *s* secured to the stand *c*, the stand *c*, the glass rod, and the reed *d*, the connections *x* for raising the reed 30 *d*, the bars *m* supporting and connecting the two reeds, and the cam operating the same as set forth and described in the annexed drawings and specifications.

4. The combination of the carriage, a plu- 35 rality of reeds, each reed being movable in a direction substantially lengthwise of its dents, and means for reciprocating said reeds in opposite directions, substantially as described.

5. The combination of the carriage, a plu- 40 rality of reeds, each reed being movable in a direction substantially lengthwise of its dents, and means for reciprocating said reeds in opposite directions, comprising a lever structure fulcrumed between its ends, 45 substantially as described.

6. The combination of the carriage, a plu- rality of reeds, one of said reeds being guided for movement substantially longitudinally 50 of its dents in the carriage, and a lever structure, the other reed being suspended in said lever structure and said first reed being carried by the lever structure, substantially as described.

7. The combination of the carriage, a 55 reed, a lever structure fulcrumed in the carriage and means for yieldingly supporting said reed on the lever structure, comprising a substantially horizontal rod and elastic de- 60 vices carrying the reed and movable laterally on said rod, substantially as described.

8. The combination, with the laterally movable carriage of a warping machine, of a rotating shaft, a cam rotatable with said shaft and movable with the carriage laterally, 65 a lever structure fulcrumed in the carriage and engaging the cam, a reed carried by said lever structure, and means for rotating said shaft, substantially as described.

Signed at Paterson in the county of Pas- 70 saic and State of New Jersey this fifteenth day of October A. D. 1906.

HUGH WATSON.

Witnesses:

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HENRY HENNING.