

(No Model.)

C. JONES & R. TOLSON.  
DIFFERENTIAL TAKE-UP FOR LOOMS.

No. 497,579.

Patented May 16, 1893.

FIG. 1.

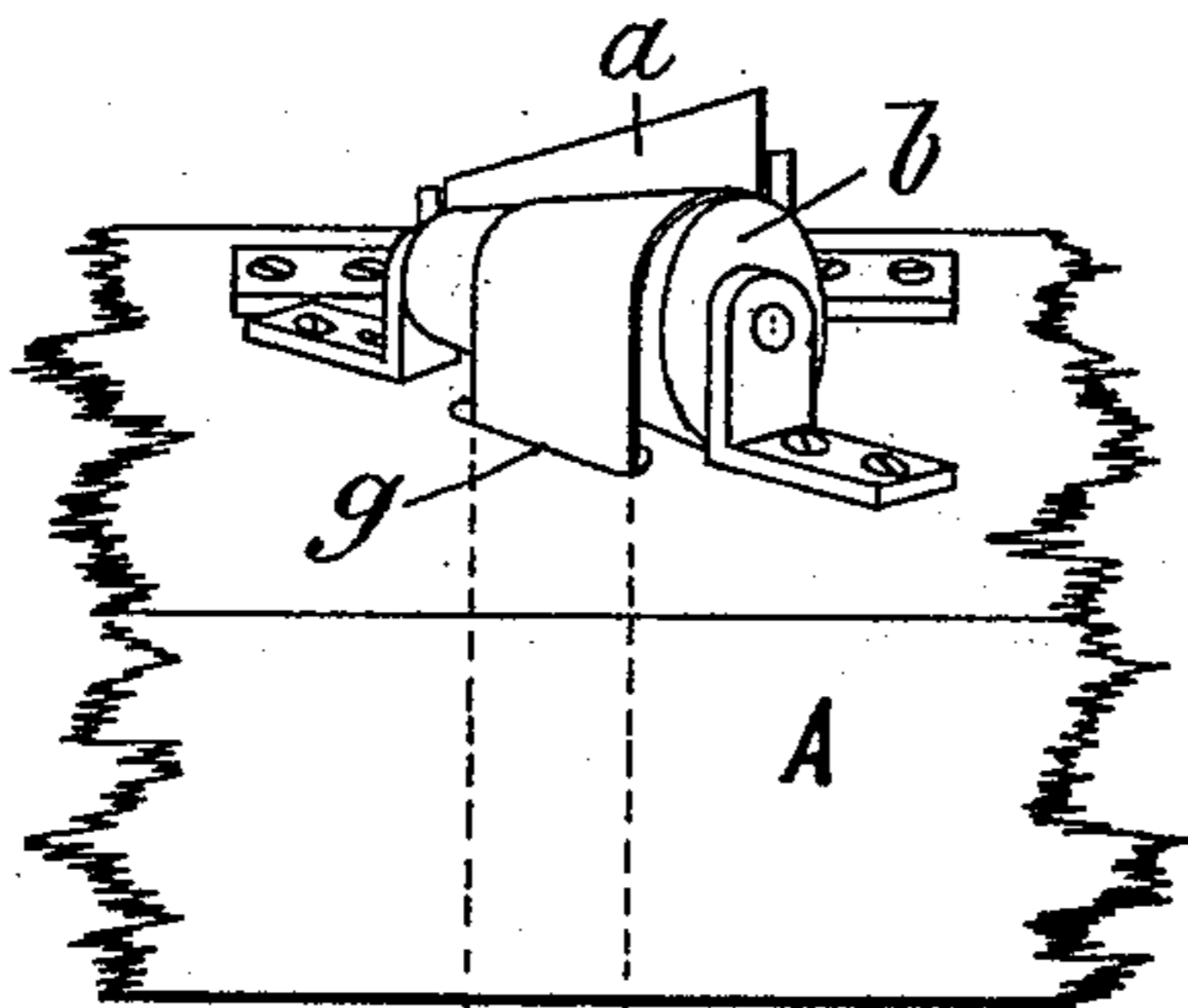


FIG. 2.

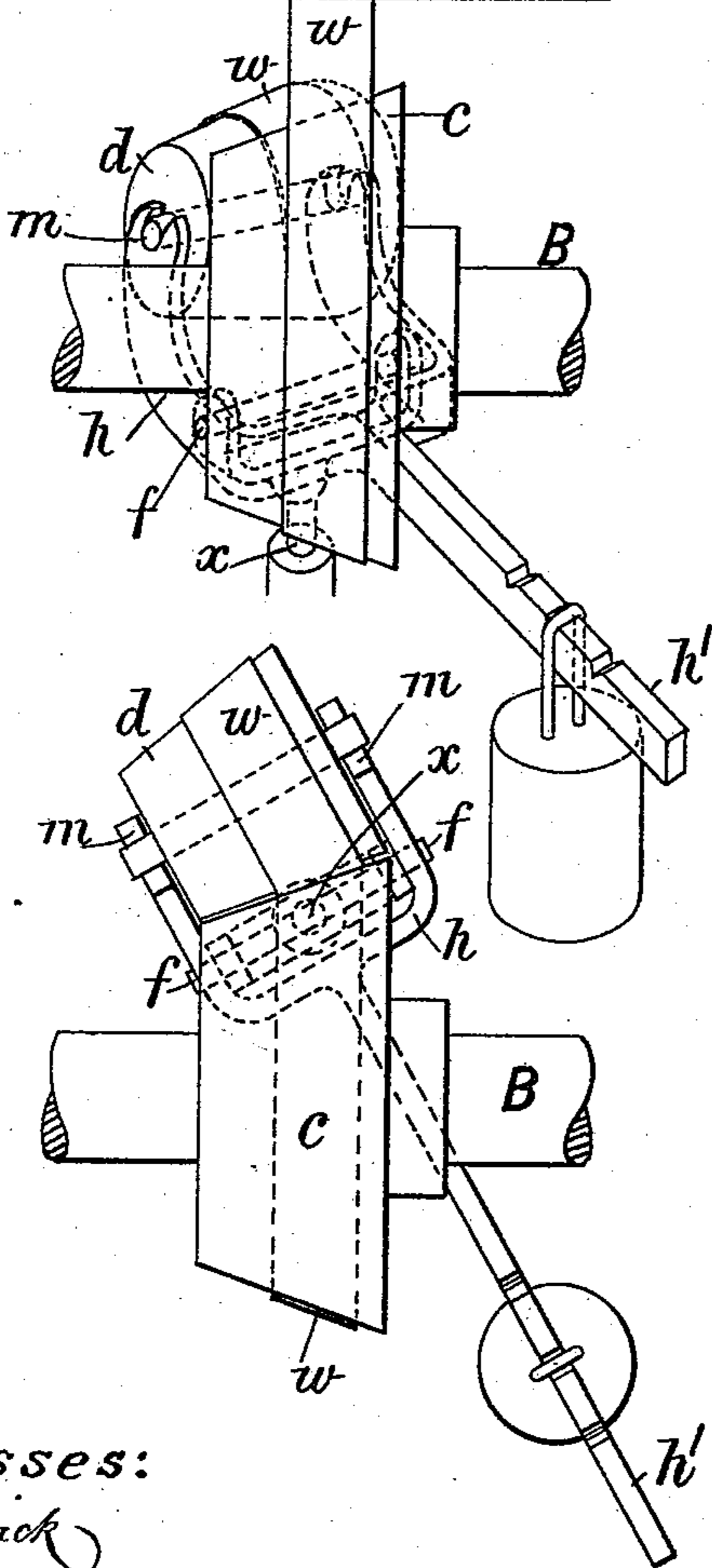
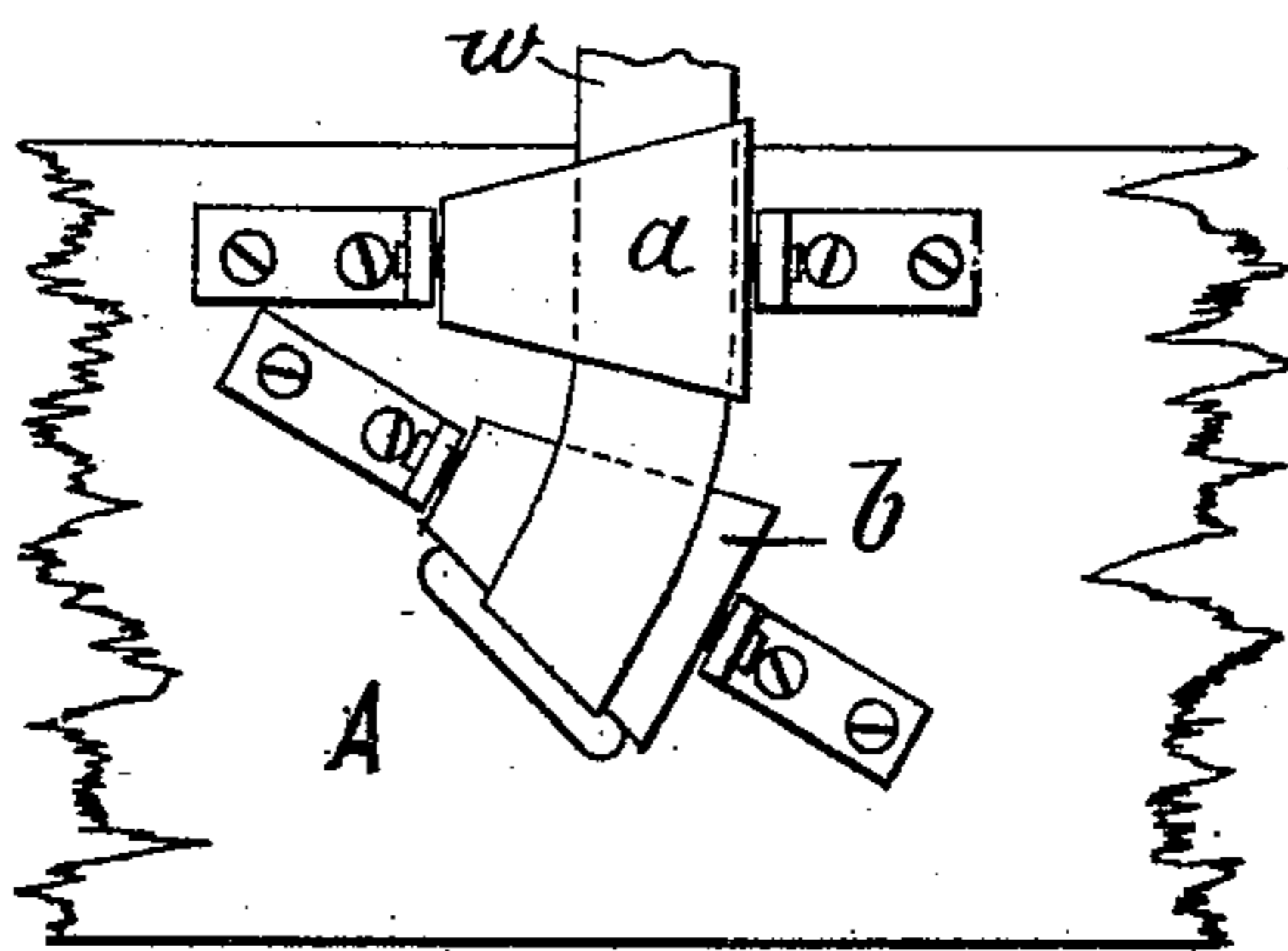
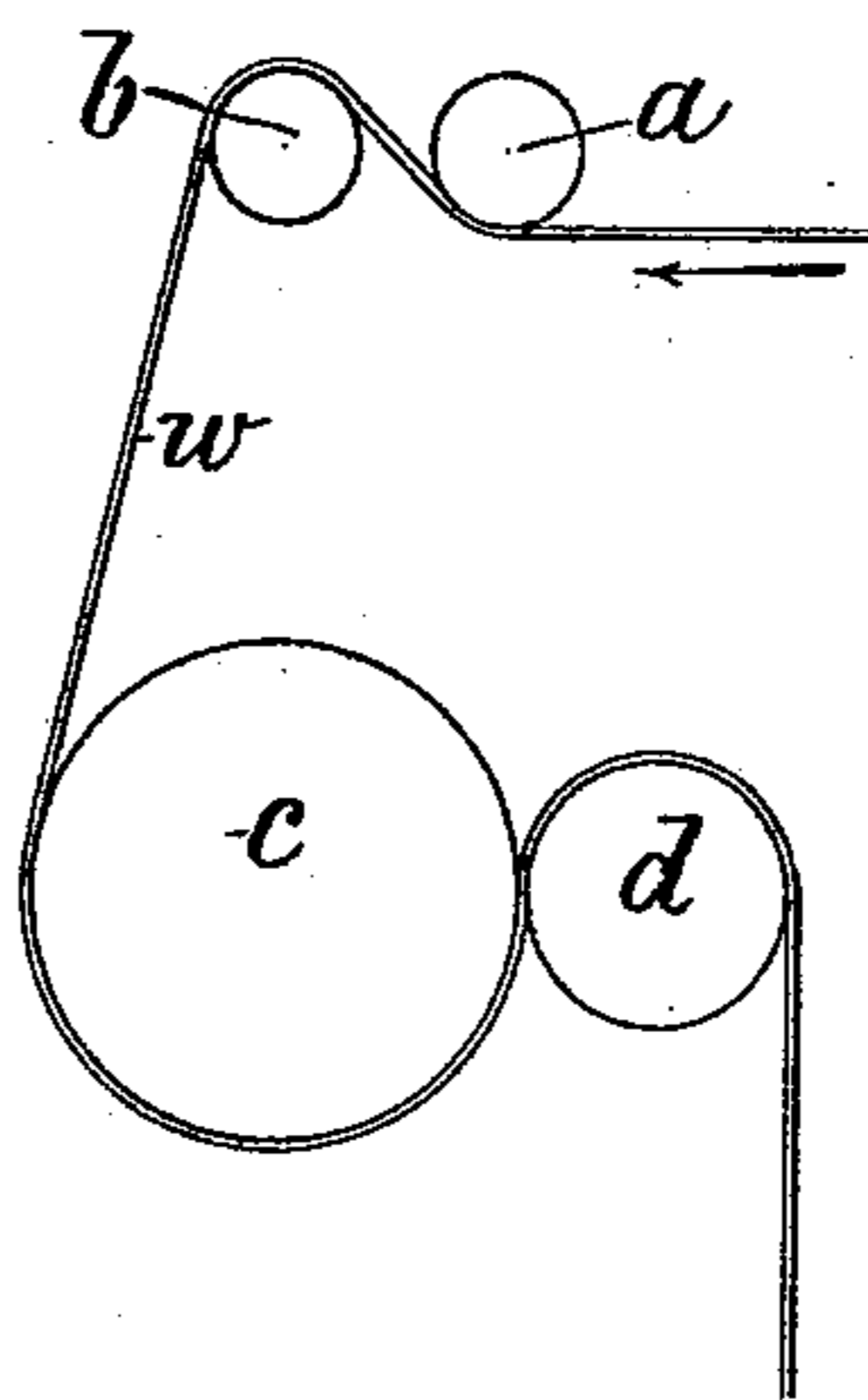


FIG. 4.



Witnesses:  
C. Sedgwick  
E. M. Clark

Inventors:  
C. Jones  
R. Tolson  
by Munn & Co  
Attorneys.

# UNITED STATES PATENT OFFICE.

CHARLES JONES AND RICHARD TOLSON, OF FAZELEY, ENGLAND.

## DIFFERENTIAL TAKE-UP FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 497,579, dated May 16, 1893.

Application filed September 30, 1892. Serial No. 447,380. (No model.) Patented in England May 17, 1889, No. 8,216.

*To all whom it may concern:*

Be it known that we, CHARLES JONES, mill manager, of the Glebe House, and RICHARD TOLSON, small-ware manufacturer, of Laurel House, Fazeley, in the county of Stafford, England, have invented a new and useful Improvement in Differential Take-Ups for Looms, (for which we have obtained Letters Patent in Great Britain, dated May 17, 1889, No. 8,216,) of which the following is a full, clear, and exact description.

This invention relates to mechanism to be applied to looms for weaving narrow fabrics for producing a combined waistband and skirt binding which is curved in the direction of its length to suit the position it will occupy on the skirt. This combined waistband and binding consists of a single web for about half its width to form the waistband and a double web for the other half of its width to receive the upper edge of the skirt and form a binding therefor, the double web being at the outside or longer curve so that the skirt will be supported and bound by the band while the latter adjusts itself to the natural curvature of the waist and hips without being cut or seamed. Our improved mechanism for producing this curved form of combined waistband and skirt binding consists in the combination with a pair of guiding and stretching conical rollers mounted on the breast beam of a loom (having a let-off motion such that the different warp threads or different sets of warp threads are let off at different speeds according to their position in the curved fabric) of a pair of conical take-up rollers arranged beneath the breast-beam, one of said rollers being positively driven and the other roller revolved by frictional contact therewith, the rollers of both pairs being arranged with their smaller ends toward the same side of the loom and in about the position hereinafter specified, so that the warp threads will be so drawn off and stretched as to be regularly graduated in length to form a fabric of the required curve.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a front view in perspective of the two sets of conical rollers applied to an ordinary loom constructed to weave a number

of narrow webs. Fig. 2 is a plan view of the guide rollers. Fig. 3 is a plan view of the take-up rollers. Fig. 4 is a diagram representing a section of the whole series of rollers through the center of the web which is shown passing round them.

The same letters of reference indicate the same parts in all the figures.

A represents the breast beam of the loom and B is the ordinary shaft which operates the take-up motion in small ware looms. This shaft B is parallel to the breast beam and to the line of weaving. Upon the breast beam A is mounted a conical guide roller *a* placed with its axis parallel to the line of weaving. A conical stretching roller *b* preferably of the same size and conicity as the roller *a* is also mounted on the breast beam A with its axis inclined at an angle to that of the roller *a* the inclination being in the same direction as but at a greater angle to the line of weaving than the inclination of the front side of the guide roller *a* and likewise than that of the front side of the take up-roller *c* down to which the web passes on leaving roller *b*. Both rollers *a* and *b* are covered with emery or sand, are placed a short distance apart as shown in Fig. 2, and turn in bearings in suitable brackets fastened to the breast beam. The conical take-up roller *c* is fixed on shaft B and another conical roller *d* is pressed against the rear side of roller *c* by its spindle being mounted to turn in bearings *m m* in the upwardly-bent forked ends of a lever *h*, the tail *h'* of which is loaded by a weight. The fulcrum of the lever is a pin *f* supported by vertical forked arms pivoted about a vertical axis at *x* so as to be free to adjust itself to roller *c*. The roller *c* is covered with emery or sand and the roller *d* is covered with leather. The conical rollers are all placed with their smaller ends in the same direction, the web in its passage moving with its outer curved double edge nearest to the larger ends of the rollers, the take up rollers being coned to the proper angle for producing a web of the required curve. The web *w* first passes under the guide roller *a*, then over the roller *b*, then through the slit *g* in the breast beam, then under the take-up roller *c*, then between the two rollers *c* and *d* and over the pressure roller *d* down into the receiving box.

For the purpose of producing the curved fabric by the mechanism above described, the warp is divided into two or more series, each series being warped upon and let-off from a separate parallel beam or bobbin, the beam or bobbin supplying the series toward the sel-  
 5 vage forming the inner curve being more heavily weighted than the beam or bobbin supplying the series toward the double edges forming the outer curve, the weighting of the beams or bobbins carrying the intervening series (if any) being graduated so as to obtain series of warp threads of different lengths and tensions, the longest threads under least ten-  
 10 sion forming the double web at the outer curve and the shortest threads under greatest tension forming the single web at the inner curve. It is evident, however, that though the several series of warp threads are of different  
 20 lengths yet the threads of any one series being warped upon and let-off from a parallel beam or bobbin would not vary individually in length, but on passing the web under a conical guide roller *a* and then over a similar  
 25 conical roller *b* fixed so that its axis is not parallel with that of the take-up roller next following but making an angle with the axes of the let-off beams or bobbins as shown, while the guide roller *a* and the first take-up roller  
 30 *c* have their axes parallel to the axes of the let-off beams or bobbins, the effect is that the web and consequently the warp threads are stretched to a greater degree than necessary for forming the required curvature, but they  
 35 afterward recover to a certain extent after passing the stretching roller *b* on to the take-up roller. If, however, the roller *b* be placed at the correct angle the warp threads which were unduly short receive a permanent stretch-

ing to the proper extent, whereby all the warp threads are graduated exactly in length so as to produce a perfect curved band without pucker, this result being due partly to the differential let-off and partly to the differential stretching. As the methods of differential let-off motion above referred to are well understood, they need no special description.

We claim—

In a loom for weaving curved waist-bands having a let off motion whereby the different warp threads or different sets of warp threads are let off at different speeds according to their position in the curved fabric, the combination with a pair of conical rollers mounted on the breast beam and acting respectively to guide and stretch the woven fabric, of a pair of conical take up rollers arranged beneath the breast beam, one of said rollers being mounted on a positively driven shaft parallel to the breast beam and to the line of weaving and the other roller being pressed against and revolved by frictional contact with said roller, the rollers of both pairs having their smaller ends directed toward the same side of the loom and their axes arranged at about the angles herein specified.

Dated this 6th day of September, 1892.

CHARLES JONES.

RICHARD TOLSON.

Witnesses:

THOS. MEADOWCROFT,  
 113 Oldfield Road, Sparkbrook, Birmingham,  
 Clerk to C. E. Mathews, Notary Public,  
 Birmingham.

HARRY LANGSLOW,  
 32 Newport Road, Moseley, Birmingham,  
 Clerk to C. E. Mathews, Notary Public,  
 Birmingham.