

J. S. DAVIES & W. E. YATES.

Improvement in Looms.

No. 115,938.

FIG. 1.

Patented June 13, 1871.

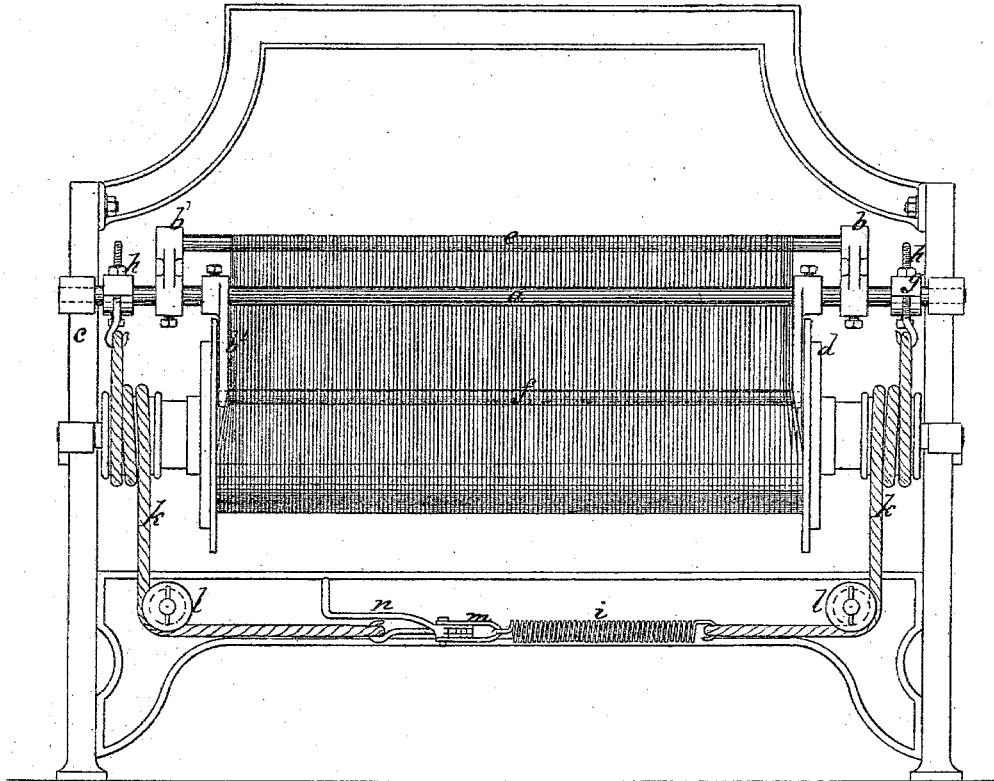


FIG. 2.

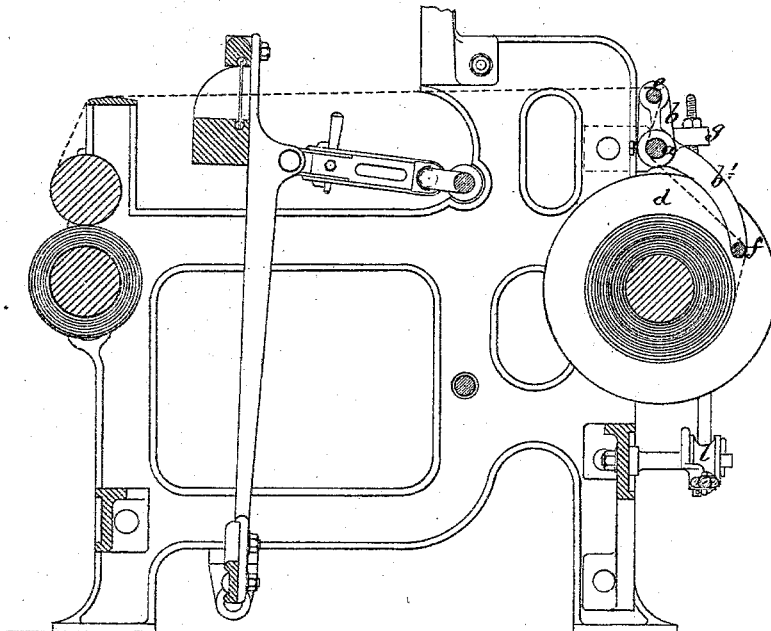
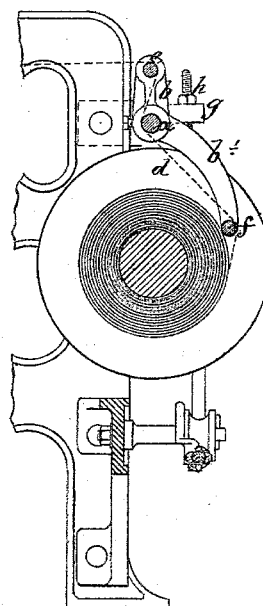


FIG. 3.



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FIG. 5.

Patented June 13, 1871.

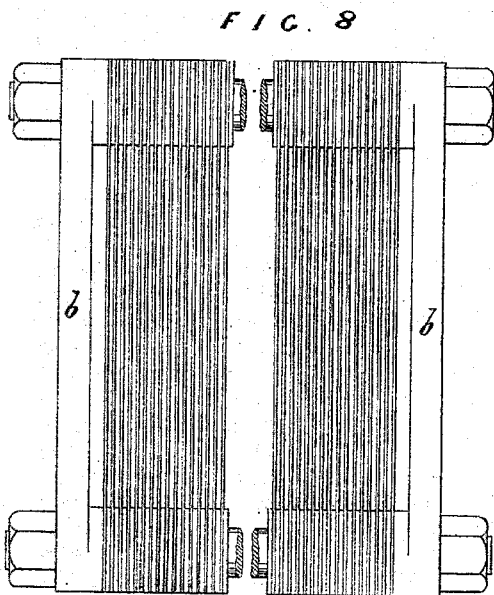
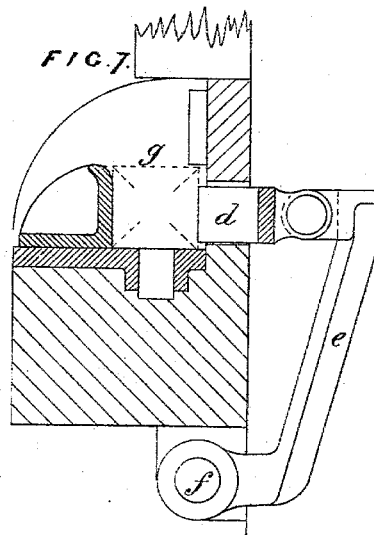
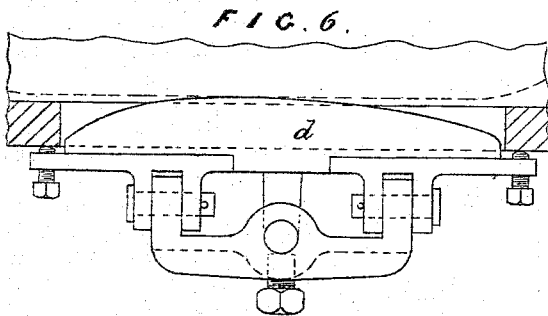
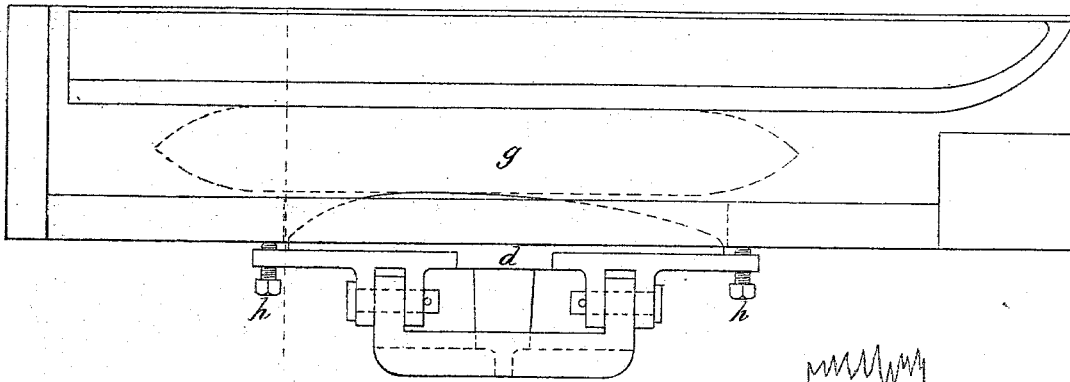
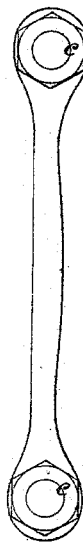


FIG. 9.

FIG. 10.

FIG. 11.



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# UNITED STATES PATENT OFFICE.

JOHN STOREY DAVIES AND WALTER EDWARD YATES, OF MANCHESTER,  
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## IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. 115,938, dated June 13, 1871.

We, JOHN STOREY DAVIES and WALTER EDWARD YATES, both of Manchester, in the county of Lancaster, Kingdom of Great Britain and Ireland, have invented certain Improvements in Looms for Weaving, of which Letters Patent of the Kingdom of Great Britain and Ireland were granted to us March 20, No. 908.

### *Nature and Object of the Invention.*

Our invention relates to certain improvements in looms, too fully described hereafter to need preliminary explanation; the said improvements having for their object the uniform delivery of the warp, the regulation of its tension, the construction of the reed so as to be more durable and efficient, and the arrangement of the swell so as to be readily adjusted.

### *Description of the Accompanying Drawing.*

Figure 1, Sheet No. 1, is a rear elevation of a loom with our improvements; Figs. 2 and 3, sectional elevations of part of the loom. Figs. 5 to 11, Sheet No. 2, detached views, drawn to an enlarged scale, of parts of the loom.

### *General Description.*

In Figs. 1 to 7, *a* is a rod forming the fulcrum of the double levers *b b'*, supported by the bracket secured to the framing *c* of the loom immediately above the flanges of the warp-beam *d*. The upper or shorter levers *b b'* carry or support a bar or rod, *e*, passing under and supporting the warp-threads as they pass from the beam *d*. The lower or longer levers *b' b'* carry a rod, *f*, that lies against the yarn of the beam and passes under the last fold or lap of the warp ends. The upper levers, carrying the rod *e*, are supplied with a projecting bracket, *g*, which supports an adjusting-screw and nut, *h*. The lower end of this screw, underneath the bracket *g*, is connected to a rope, cord, or chain, *k*, that is caused to pass first around the drag-pulley of the warp-beam, then under a carrier-puller, *l*, connected to the lower frame of the loom below the warp-beam, after which it passes onward and is attached to one end of a rod connected to one end of the reversible lever *n*, the fulcrum of which is secured to the link *m*, forming part of a helical

or coiled spring, *i*. This helical spring is the medium or connection between the ends of the two cords, ropes, or chains *k*. The opposite end of such spring from the reversible lever is attached to a rope or chain which passes, in a similar manner as the one already described, around the opposite drag-pulley of the warp-beam to the adjustable screw *h*, supported by the bracket secured to the fulcrum-shaft *a* of the lever *e*, on the opposite side of the loom.

When the loom is ready for action the tension of the warps is first adjusted by the nuts and screws *h h*, which tighten up the ropes *k k*, passing around the drag-pulley of the warp-beam *d*, connected to the coupling-spring *i*. The action of tightening up these cords or ropes, through the medium of the nuts and screws *h*, is continued until the required tension of the warp is obtained. When the tension is accomplished and the loom in action the beating up of the sley when closing in the weft, at which time the crank is on its front center, as shown at Fig. 2, draws forward the top bar *e*, thereby causing the lower rod *f* to exert a pressure upon the warp-threads that gives an excess of tension to the same at the time of beating home the weft-shot, which effects a cover upon the cloth under manufacture. On the return of the sley, when the shed is forming and the sley is on its bottom center, (*vide* Fig. 3,) the upper rod or bar *e* is caused to incline outward, causing thereby the lower rod *f* against the beam to become relieved so as to reduce its tension upon the warp, simultaneously with which the ropes encircling the drag-pulleys of the beam are also eased, which allows the necessary quantity of yarn to be drawn easily from the warp-beam sufficient for the next pick, and the healds to open the shed without strain or tension upon the yarn. Again, as the diameter of the beam becomes reduced with the delivery of yarn therefrom the lower tension-rod *f* is carried with the passing warp-threads gradually nearer to the beam, thereby effecting, during the delivery of the yarn, a proportionate reduction of tension to the springs forming the coupling between the ends of the ropes *K K*. When it is desired to let back the warp a temporary release is given to the yarn through the me-

dium of the lever *n*, which, when pulled over into a position the reverse of that shown at Fig. 1, relieves the spring *i*, the original tension being readily obtained on recommencing weaving by passing the lever *n* into its original position.

Figs. 8, 9, 10, and 11 represent the "dents" composing the reed, which it will be seen are of a greater width midway between their supporting-bars *a a* than at their points near such bars. The top and bottom terminations of each dent are provided with oval holes, as seen at Fig. 10, or recesses, as seen at Fig. 11, through or into which they are slipped or placed onto their parallel supporting-bars *a a*, the two bars being connected at either end by the tie-rods *b b*. The distance or spaces of the dents upon the rods are effected by placing between each dent a washer, which at the selva ends of the reed may be composed of India rubber, which, yielding, will allow the end dents only to be forced closer together to produce a denser edge or selva to the cloth. By the arrangement of reed, damaged dents can be readily displaced by slackening the nuts *c c*, and new ones put in their places.

Fig. 5 represents a plan view of the shuttle-box, showing the position of the swell in relation to the shuttle-box. Fig. 6 represents another modification of the swell and its supporting-bracket, showing an arrangement of adjustment for giving more or less inclination to the swell in the box; and Fig. 7 represents a transverse section of the same. In these figures *d* is the swell, supported by the brackets or arms *e*, secured to the stop-rod *f*. The distance the swell *d* is allowed to protrude in

the shuttle-box *g* is regulated by the set-screws *h*. Thus, when the shuttle enters the box the swell moves bodily back, giving, by the form of its incline surface, owing to its protruding to the greatest extent near its outer end, an increased resistance to the shuttle on its completing its race; but when the shuttle is again expelled the resisting incline, acting then upon the shuttle in its reverse direction, at once relieves and assists, by the pressure of its incline, the expulsion of the shuttle into the opposite box.

We claim—

1. The rod or shaft *a*, with its arms, carrying the rods *e f* and its arms *g*, in combination with the warp-beam, the cords *k k*, spring *i*, and pulleys *l l*, the whole operating substantially as described.

2. The combination of the above and a device, substantially as described, for tightening and releasing the cords *k*, as set forth.

3. A reed, consisting of a central row of stationary dents, and at each end a series of dents separated by elastic washers, as and for the purpose described.

4. The adjustable swell *d*, in combination with the brackets *e* and stop-rod *f*, substantially as set forth.

In witness whereof we have hereunto set our hands in the presence of two subscribing witnesses this the twenty-first day of July, one thousand eight hundred and seventy.

JOHN STOREY DAVIES.

WALTER EDWARD YATES.

Witnesses:

WILLIAM LEWIS,

HANDFORD JONES.