(No Model.)

T. LAMB.

Heck for Warping Machines.

No. 239,806. **Patented April 5, 1881.**

Fig. 1.

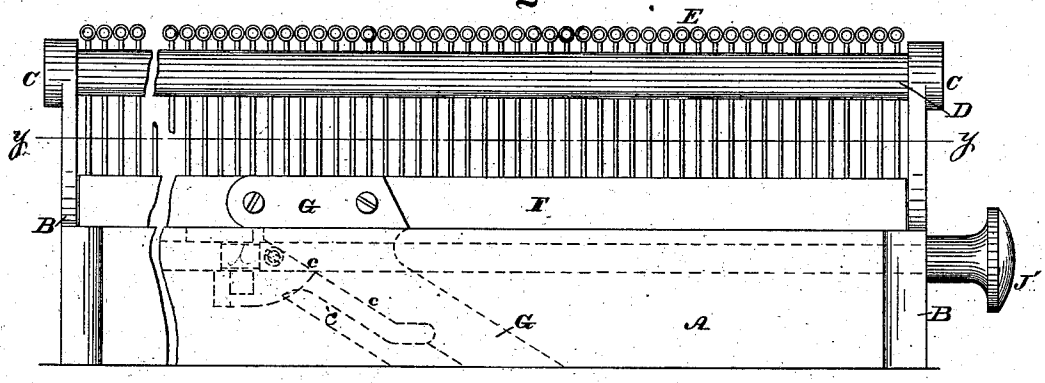


Fig. 2.

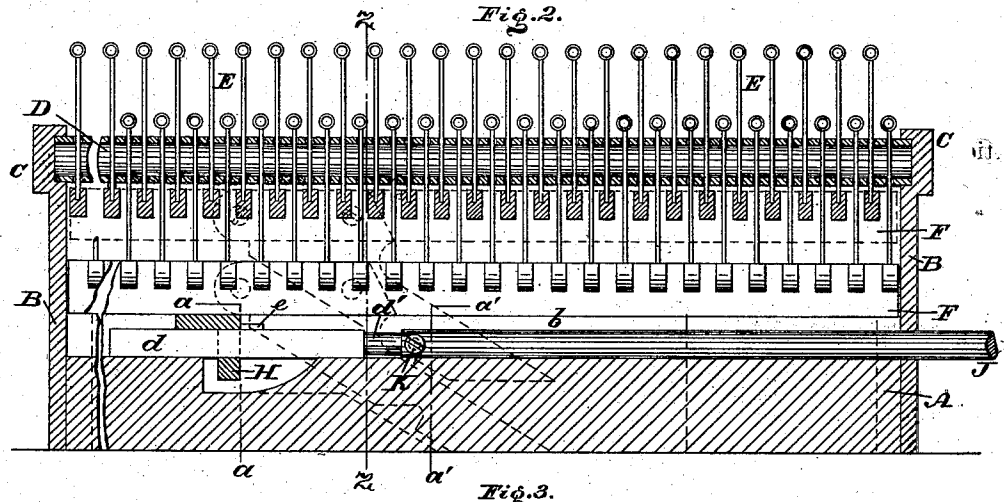


Fig. 3.

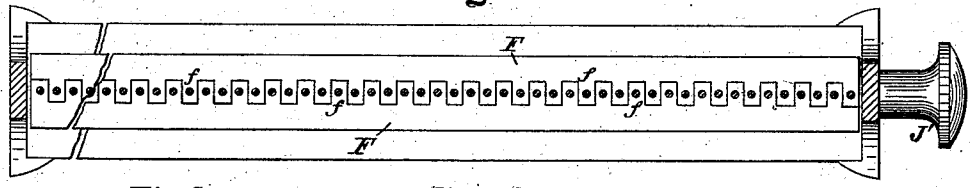


Fig. 5.

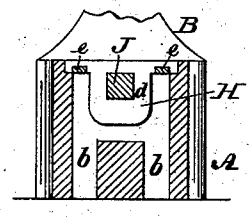


Fig. 4.

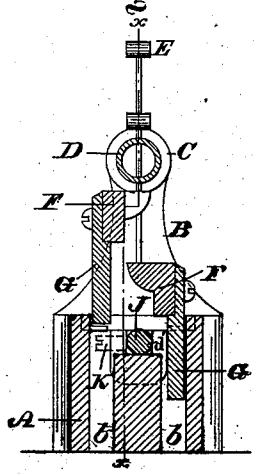
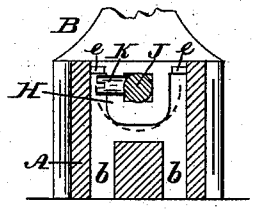


Fig. 6.



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UNITED STATES PATENT OFFICE.

THOMAS LAMB, OF PHILADELPHIA, PENNSYLVANIA.

HECK FOR WARPING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 239,806, dated April 5, 1881.

Application filed September 13, 1880. (No model.)

To all whom it may concern:

Be it known that I, THOMAS LAMB, a citizen of the United States, residing in the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Hecks for Warping-Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of the heck embodying my invention. Fig. 2 is a longitudinal vertical section in line *x x*, Fig. 4. Fig. 3 is a horizontal section in line *y y*, Fig. 1. Fig. 4 is a transverse vertical section in line *z z*, Fig. 2. Fig. 5 is a vertical section of a portion in line *a a*, Fig. 2. Fig. 6 is a similar section in line *a' a'*, Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

As is well known, hecks consist of two series of eyes through which the yarns pass from the warping-machine to the beam on which they are wound, said series being alternately operated, so that the yarns of the warps are alternately raised, lowered, and separated.

This invention relates to hecks for warping-machines; and it consists in the construction and combination of parts hereinafter set forth.

Referring to the drawings, A represents the base of the heck, from the ends of which rise uprights B B, each having at top a socket or cup, C, by which is supported a rail, D, extending horizontally from one to the other, and having numerous vertical perforations, into each of which is fitted the shank of one of the needles or eyes E of the heck. The needles or eyes E are in two series, each connected to a rising and falling bar, F, the two bars extending parallel with the rail D, below the same, and when in their lower position resting on the base.

Depending from each bar F is an arm, G, projecting into a chamber in the base A, and each is provided with a diagonal slot, as shown by the dotted lines in Fig. 1.

Within the chamber *b*, adjacent to the upper ends of the diagonal slot *c* in the arms G, is secured an upright plate, H, having an angular opening, through which is passed and guided a longitudinally-extending rod, J, which is likewise supported at other points of the base A, as well as in the end of upright B. The portion *d* of the rod that is passed through the guides H is angular, and the portion at the inner termination of said angular portion is cylindrical and reduced to form a neck, *d'*, the object of which is, that when the angular portion *d* of the rod is in the guide-plate H said rod cannot be rotated, but when the neck *d'* is within said plate the rod may be rotated. Projecting from the rod at or about a right angle thereto is a stud, screw, or pin, K, which is secured to the rod near the neck *d'* thereof, and so disposed that when it is in a horizontal position it may strike the edge of the diagonal slot *c* of either of the arms G.

In order to limit the rotation of the rod J, and consequently of the pin K, I secure to opposite sides of the upper portion of the plate H, or other proper portion of the base A, two stops, *e e*, against which the stops strike when the rod J is rotated, preventing more than a half-turn of the same. When the pin K strikes either stop *e*, the former is in horizontal position to be advanced against the diagonal *c* of one of the arms G on the same side as the pin for lifting said arm, and consequently the relative bar F, as will be hereinafter stated.

The operation is as follows: The rod J, being in position, Fig. 1, has its neck *d'* in the opening of the plate H, and may be rotated by the button or head J', in order to place the pin K in position. The rod is then drawn out, and the pin K, bearing against the side of the slot *c* in one of the arms G, and moving with the rod, raises said arm, and consequently the bar F, with the attached series of needles or eyes E. As the angular portion *d* of the rod is now in the angular opening of the plate H, the rod is prevented from turning, and the series of needles or eyes, as elevated, are sustained without liability of accidental lowering. When the other series of needles or eyes is to be raised, the rod J is pushed in to its fullest extent and the raised bar, no longer controlled by the pin K, lowers or returns to its first position. As the neck *d'* is again in the opening of the plate H, the rod J may be rotated, and thus bring the pin K into the slot in the other arm G, which, when the rod is drawn out, as before, is raised by the pin, and the respective series of needles or eyes is elevated. This alternate

action of the two series of needles or eyes may be continued as long as desired, it being noticed that by the provision of the rotating rod J and its pin K, and proper rotation of the same, a single rod is adapted to operate two series of needles or eyes.

It will be observed that the rail D is of considerable length, and strength is required to prevent it from sagging. This is accomplished by making it of tubular form, this also decreasing the weight of the rail.

The inner sides of the two rails F are toothed or corrugated, as at *f*, the teeth of one rail entering the spaces of the teeth of the other rail. As the shanks of the needles or eyes E are connected to the middle of the teeth or corrugations *f*, they are centered on the two bars, or extend in the same right line, as shown in Fig. 3, and the bars are guided one on the other in starting from and returning to their first positions.

If desired, the pin K may carry a roller for easing the operation of running in the slot in the arm G.

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

1. The two bars F, each provided with a series of needles or eyes, E, and having an arm, G, with an oblique slot therein or extension thereof, in combination with a single lifting-rod, J, having a laterally-projecting pin, K, adapted to engage with the slot in, or lateral extension of, either of the arms G, substantially as set forth.

2. The two needle or eye carrying bars F and arms G, provided with oblique slot *c*, in combination with the rod J, having an angular portion, *d*, and neck *d'*, the pin K, and the guide-plate H, substantially as and for the purpose set forth.

3. The needle or eye carrying bars F, in combination with the needles or eyes, the tubular perforated guide-rail D, and supports for said guide-rail, and devices for vertically raising and lowering said bars F, substantially as set forth.

4. The needle or eye carrying bars F and guiding-rail, in combination with the needles, the uprights B, having cups C, and devices for raising and lowering said needle-bars, substantially as set forth.

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