

(No Model.)

C. DENN.
WARP LINKING MACHINE.

No. 288,032.

Patented Nov. 6, 1883.

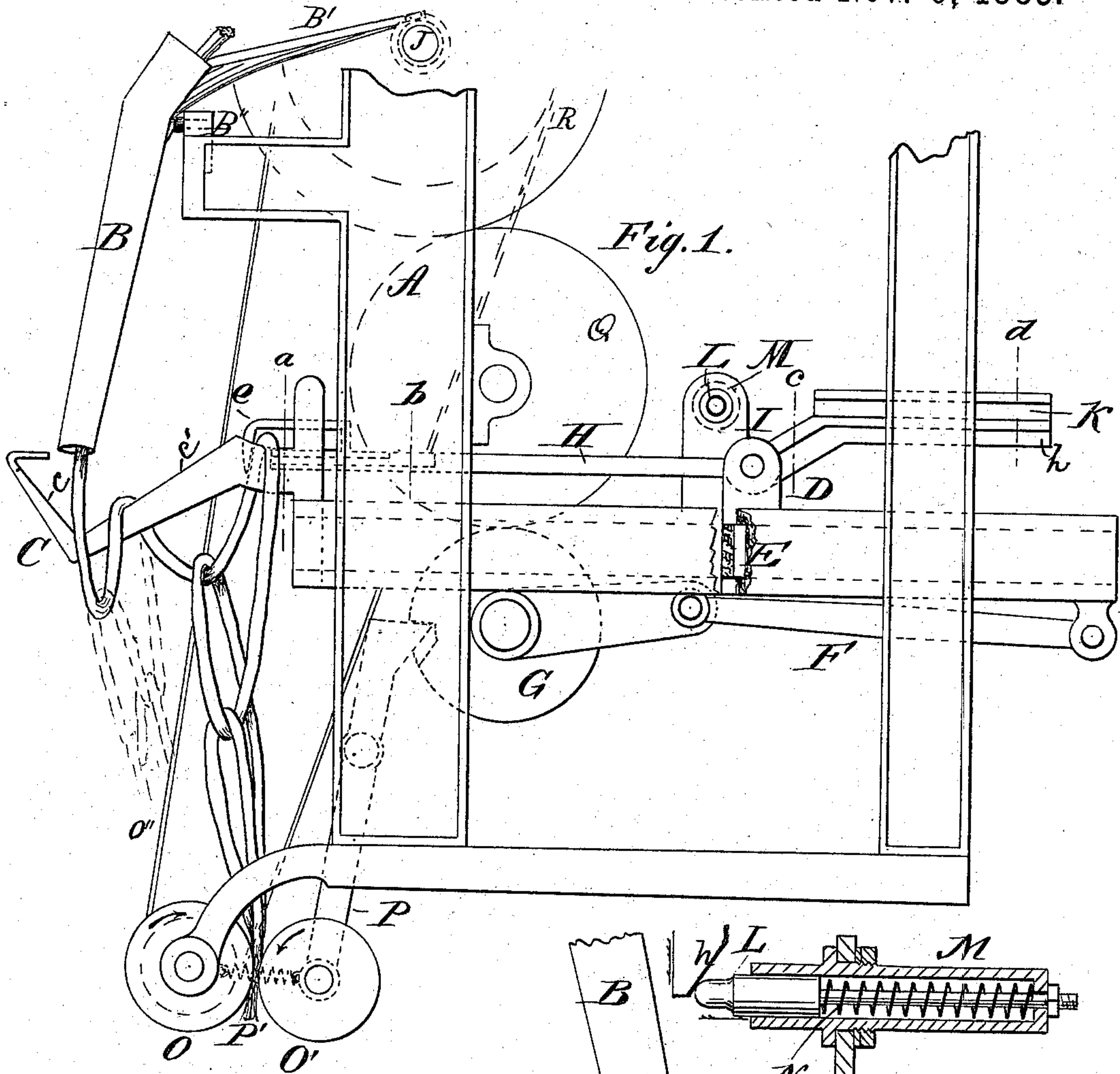


Fig. 4.

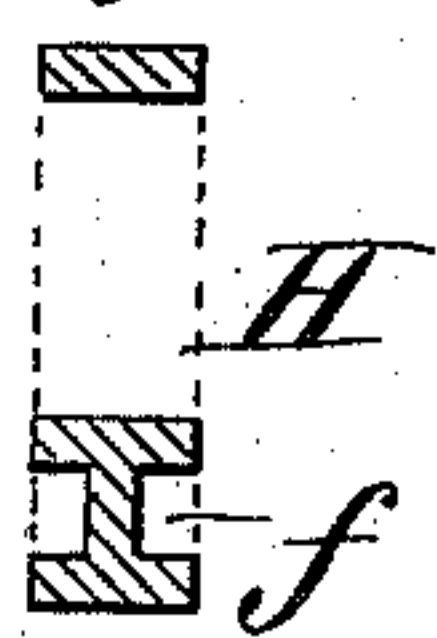


Fig. 5.



Fig. 2.

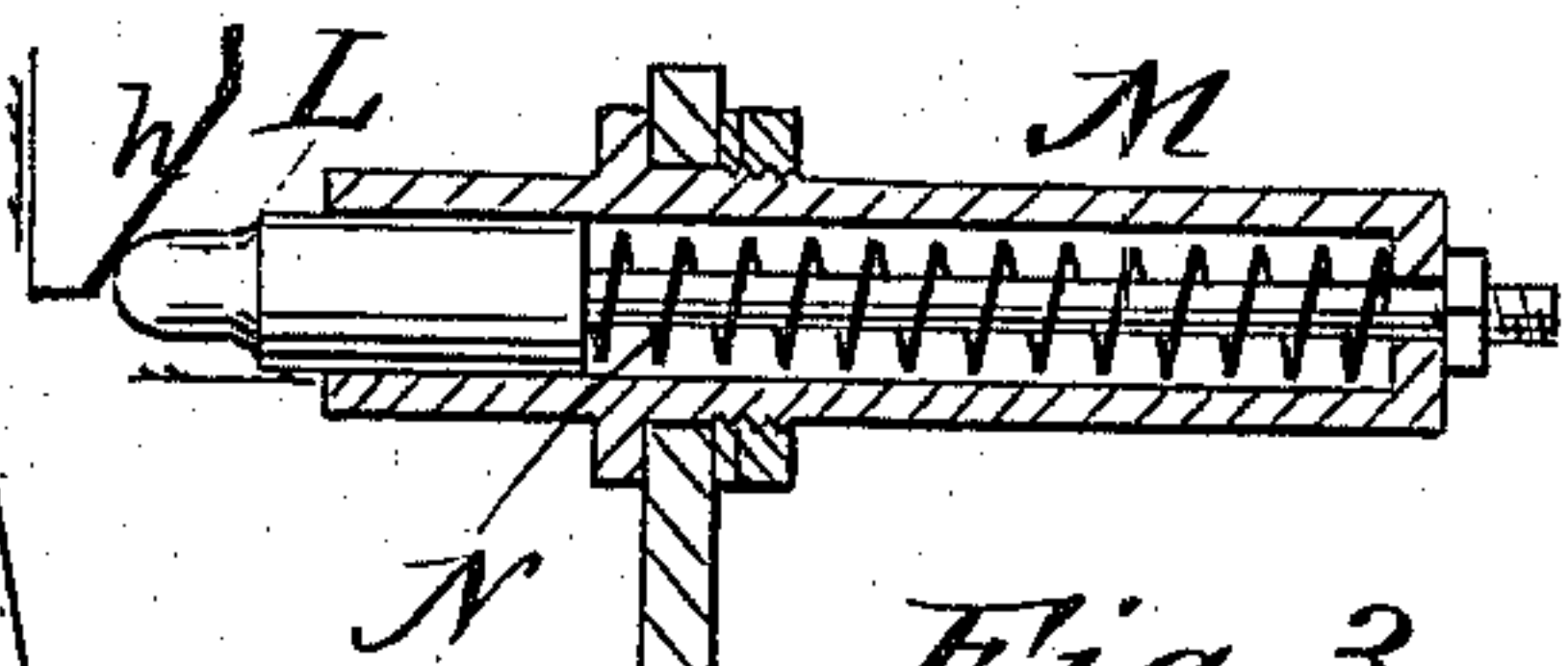
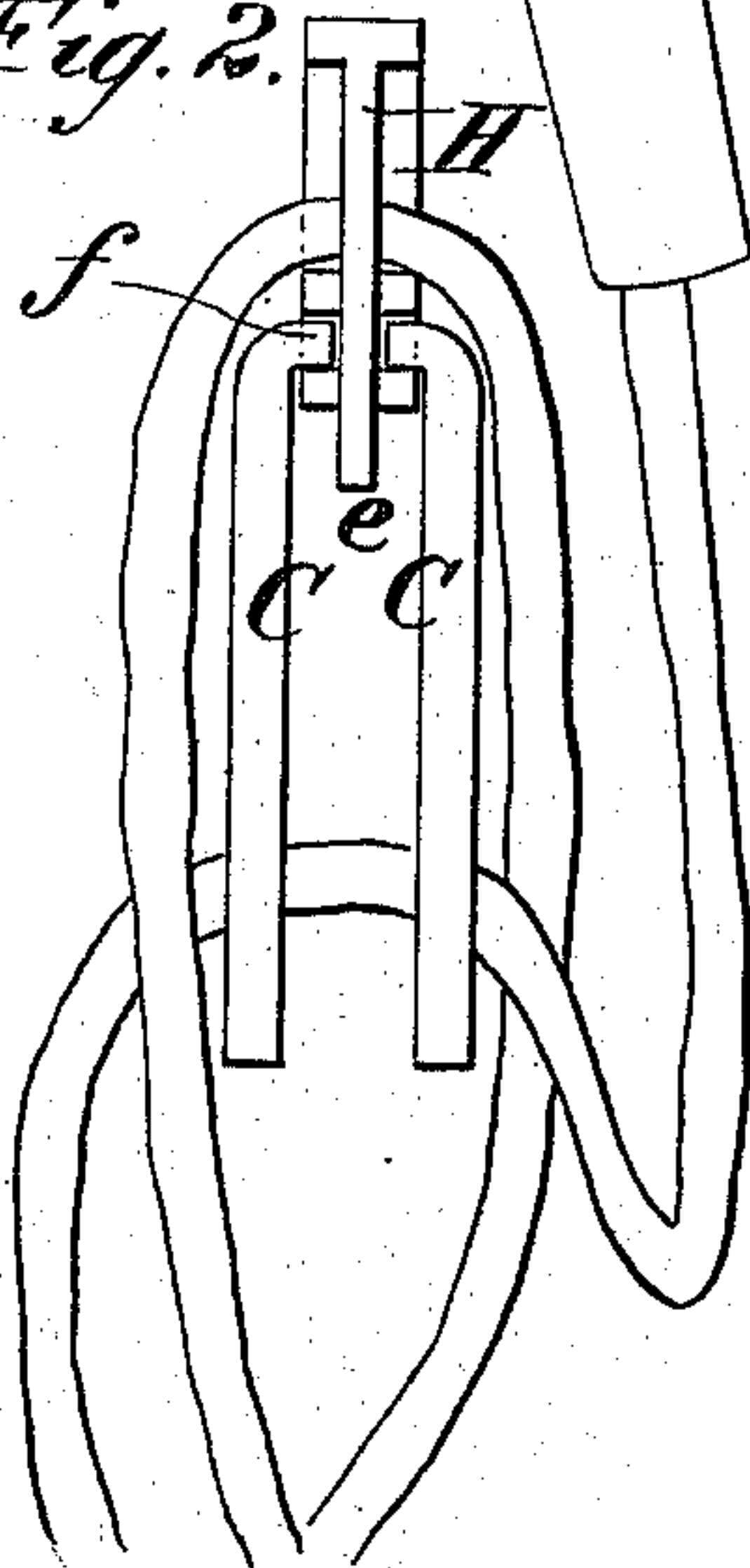


Fig. 3.

Fig. 7.

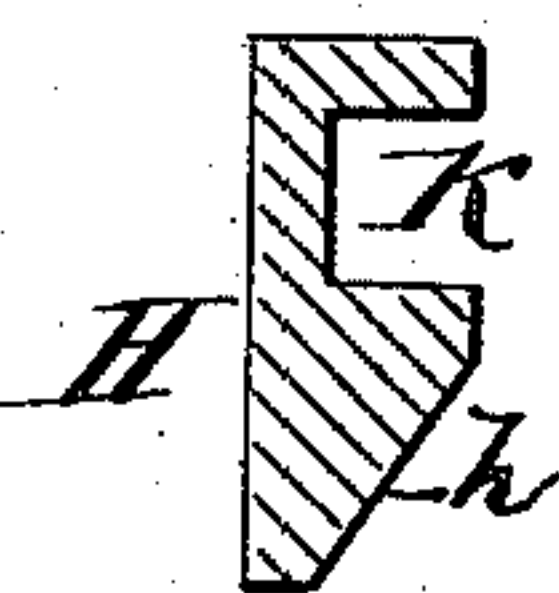
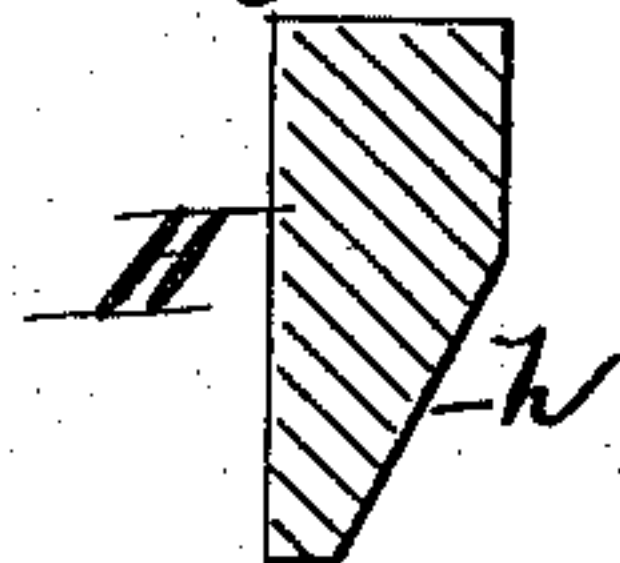


Fig. 6.



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CLAYTON DENN, OF PHILADELPHIA, PENNSYLVANIA.

WARP-LINKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 283,032, dated November 6, 1883.

Application filed February 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, CLAYTON DENN, of Frankford, in the city and county of Philadelphia and State of Pennsylvania, have invented a new and Improved Warp-Linking Machine, of which the following is a full, clear, and exact description.

My improvements relate to machines for linking warps as they are delivered from warping-machines; and the invention consists in certain novel features constructed and combined, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents in side elevation the delivery portion of a warping-machine with the linking mechanism. Fig. 2 is an end view of the linking mechanism. Fig. 3 is a longitudinal section of the guide-pin connection of the hook. Figs. 4, 5, 6, and 7 are cross-sections of the hook on the respective dotted lines *a b c d*.

A is the standard of the warping-machine, carrying the pivoted delivery horn or tube B, which is to be moved from side to side in the usual manner.

C is a fork fixed beneath the delivery end of tube B for receiving the loops of the warp.

D is a slide fitted for horizontal reciprocation in side guides, one of which is shown at E, and connected by a rod, F, to a crank-wheel, G, that is to be rotated, by suitable connections, with a prime mover, so as to reciprocate the slide D.

H is the looper jointed at I to the slide D, with its forward hook-shaped end, *e*, extending between the arms of the fork C, and having its rear end beveled, and formed with a groove, K, as shown in Figs. 6 and 7.

L is a pin placed in position for engaging the groove K in the forward movement of the looper H. As shown in Fig. 3, the pin L is carried by a socket, M, containing around the pin a spiral spring, N, that projects the pin.

O is a roller in fixed bearings, and O' a second roller hung on a lever, P, and drawn toward roller O by a spring, P'. The upper end of lever P is positioned to bear on the crank-wheel G, so that the rollers are separated, ex-

cept at one point, in the movement of the mechanism, when a notch in the wheel allows the roller O' to move to the roller O.

The arms of the fork C are bent upward at their forward ends, *c*, so as to support the loop made by the tube B below the end of the looping-hook *e*, and the rear portion of the arms of the fork C is inclined upward at *c'*, so as to raise the loop upward as it is drawn backward by the looper, as hereinafter described. Beneath its hook the looper is formed with a projection for carrying the looped warp. The external ends of arms of the fork C are bent inward, and, as shown in Fig. 4, the forward portion of looper H is grooved at *f* to pass upon and cover the ends of the arms of the fork C, as represented in Fig. 2, so as to prevent entanglement of the warps with the said ends. In Fig. 1 a warp is represented as carried back by the looping-hook *e* and a loop formed at one side of the fork C by the movement of the tube B to that side.

In the operation of the machine the looper H now moves forward, and the pin L engaging the groove K, the looper-hook is guided between the ends of the arms of the fork C. This movement carries the loop of warp on the looper over the ends of the arms of the fork C, and it drops down over the loop in the angle of the arms, thus forming a link. The further movement of the looper in the same direction clears it from pin L and the hook end *e* drops, so that at the backward movement the loop on fork C is engaged and carried back and upward. Tube B now swinging to the other side, another loop is laid on fork C, and the operation is repeated. At the backward movement of looper H, its hook end *e*, gradually ascending the incline *c'*, causes its rear end to descend and the pin L is pressed back into its socket by the inclined surface *h* of the looper, and when the looper attains its original level the pin L springs into slot K, as before. Gravity causes the rear end of loop to descend as soon as released from hook until the two rollers grasp and pull it. The linked warps pass down between rollers O O', one of which is rotated by means of a belt, O'', driven by a pulley on shaft, J, continuously, and at the moment looper H is in its backward posi-

tion the lever P is released by the notch on roller G, so that roller O', being drawn against the warp, the warp will be gripped for a moment with the effect of giving a pull, so that
 5 the links are tightened and kept of uniform length.

The method of attaching this linking device to a warping-machine is common, as shown in Patent No. 25,501, and the device there shown
 10 for oscillating tube B would answer the same purpose in my invention; but as this vibratory movement is intermittent and bears a fixed relation to the reciprocating movement of looper H, I will describe one means for accomplishing
 15 the same. Let the pipe B be pivoted at B' to the frame A. Let its arm B' engage a cam on shaft J. This cam is shaped to hold the pipe still for nearly one-half a revolution, and then to suddenly swing it one way across fork C.
 20 The arm now holds the pipe still for nearly another half-revolution and then suddenly swings it back. Upon the same shaft with wheel G may be a toothed wheel of the same size engaging an intermediate wheel, Q, which
 25 communicates motion from wheel R. The gear-wheel on the shaft of wheel G is one-half the size of wheel R. The latter is continuously revolved by the driving-power. Each revo-

lution of shaft J causes, first, the pipe B to swing one way; then a full revolution of wheel
 30 G, giving a forward thrust and a withdrawal of looper H; then pipe B swings the other way across, and another revolution of wheel G produces a similar result. This construction produces very rapid linking of the warp. 35

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

1. The fork C, having arms inclined at their rear ends, substantially as and for the purpose
 40 specified.

2. The combination, with the fork C, the slide D, means for reciprocating it, and the looper H, provided with the slot K, and beveled edge h, pivoted to said slide, of the pin
 45 L and spring N, as shown and described.

3. The looper H, formed with grooves f, and provided with means for operating it, in combination with a fork having ends bent inward, substantially as described, for the purpose
 50 specified.

CLAYTON DENN.

Witnesses:

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 JABEZ H. GILL.