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R. H. PLUMMER.

Warper.

No. 215,239. Patented May 13, 1879.

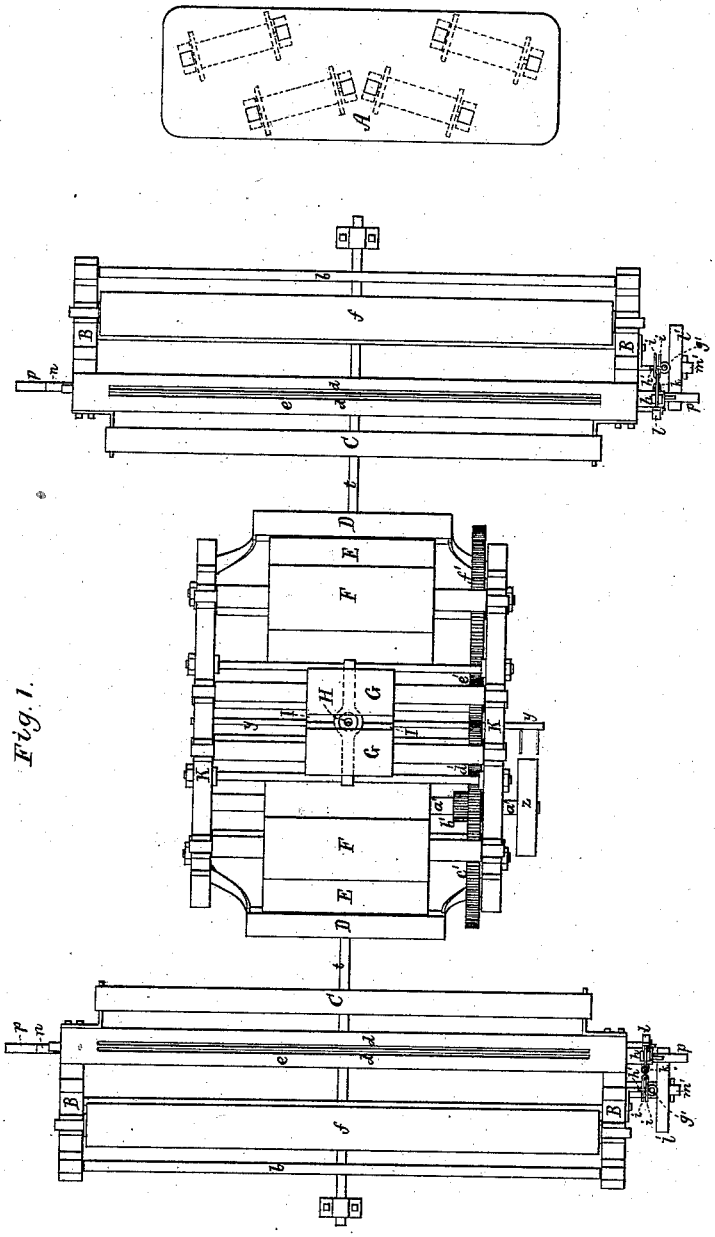

Fig. 1.

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3 Sheets—Sheet 2.

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Warper.

No. 215,239. Patented May 13, 1879.

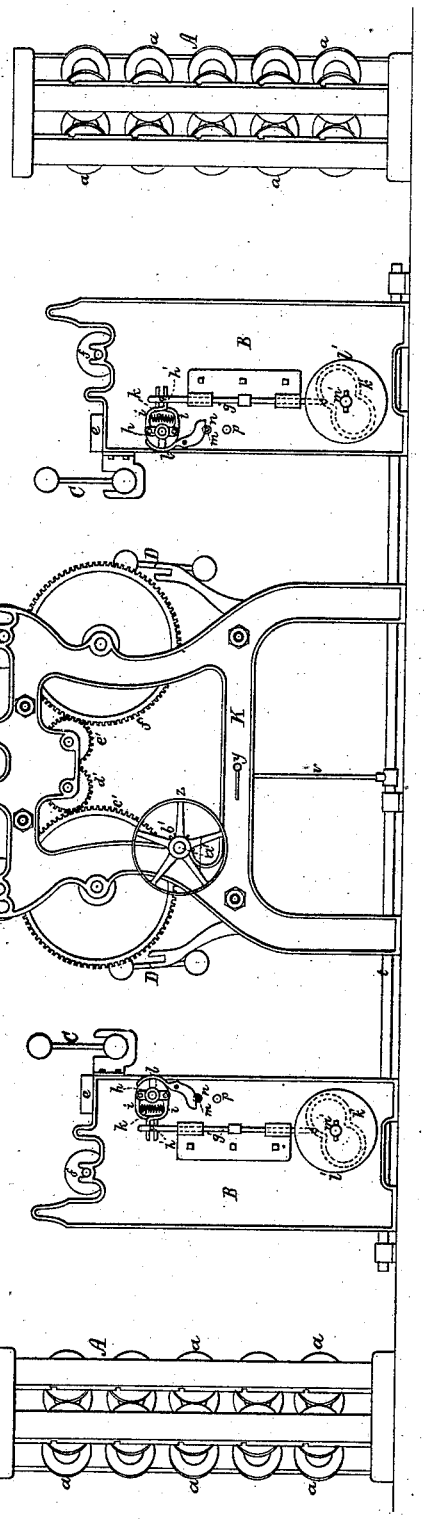

Fig. 2.

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Fig. 4

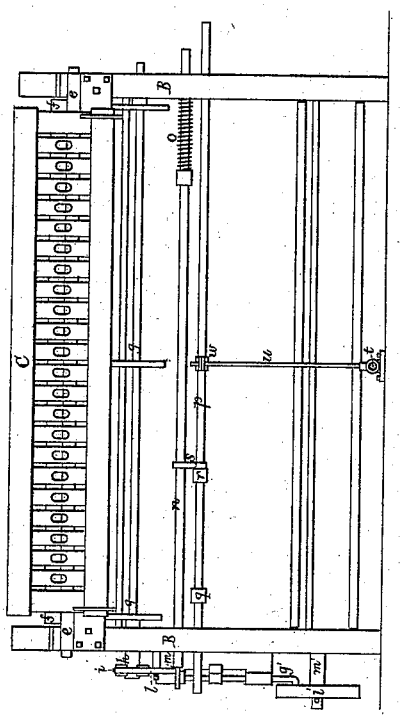
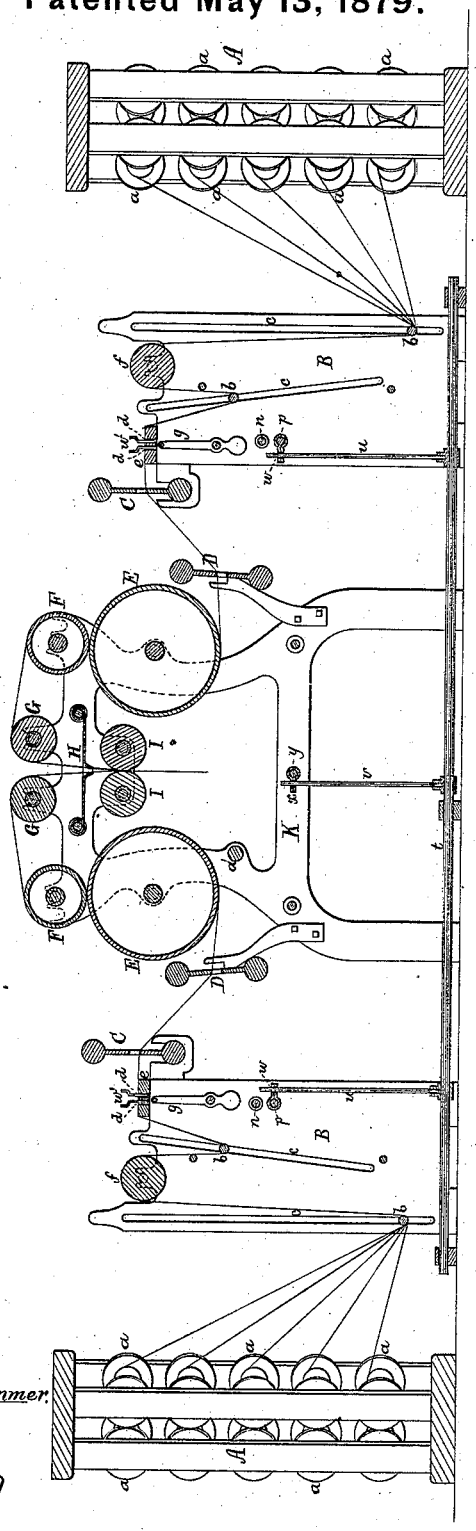


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

RICHARD H. PLUMMER, OF NORWICH, CONNECTICUT, ASSIGNOR TO LOWELL MACHINE SHOP, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN WARPERS.

Specification forming part of Letters Patent No. **215,239**, dated May 13, 1879; application filed February 10, 1879.

To all whom it may concern:

Be it known that I, RICHARD H. PLUMMER, of Norwich, of the county of New London, of the State of Connecticut, have invented a new and useful Improvement in what are termed "Warpers," or Machines for Fasciculating and Bundling Warp-Yarns; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 is a front-side elevation, and Fig. 3 is a longitudinal section, of a duplex machine embodying my invention. Fig. 4 is an inner-side elevation of one of the main reeds and the stop-motion adjacent thereto.

The machine hereinafter described is provided with a set of delivery-rollers, two creels, two stop-motions, two main reeds, two reducing-reeds, two sets of draft-rollers, and suitable guide-rollers, all being substantially as hereinafter explained and as represented.

The two stop-motions have combined with them mechanism by which, when a yarn from either creel becomes broken, the duplex machine will be stopped. In connection with each creel and its pair of reeds I use gravitating or drop rollers to take up the slack of the yarns.

In the drawings, A A denote the two creels, each of which has one or more series of spools, *a*, arranged within it in any proper manner, the machinery for fasciculating the yarns from such spools being disposed, as shown, between the creels. The yarns from each creel are carried under one or more gravitating or drop rollers, *b*, whose journals extend into vertical guide-grooves, *c*, made in the opposite ends of the two stop-motion frames B B. These gravitating rollers rest upon the yarns and keep them from hanging loose and kinking. Thence the yarns from each creel pass over a horizontal roller, *f*, and through a set of drop-wires, *w'*, constituting part of the stop-motion. These drop-wires, such as are generally used in warpers, are placed in long slots *d d* made in a bar, *e*, extending across the top of the frame B and directly over the stop-motion vibrator. To each frame B there is fixed, in front of its bar *e*, a main reed, C, through the openings of which the yarns are led from the spools of the next adjacent creel, there being a separate opening for each of the yarns. At a suitable distance from each main reed there is arranged a supplementary or reducing reed, D, having a number of orifices or guide-holes, properly less than there may be in the main reed—as, for instance, the supplementary reed may have a fifth of the number of holes or passages that there may be in the main reed. The yarns from the main reed are led through the holes or passages of the supplementary reed, the requisite number of them being passed through each hole thereof. Thence they pass under and up and around a large draft-roller, E, and between it and a fellow draft or gravitating roller, F, arranged on top of such draft-roller E. Thence the yarns go to and over a guide-roller, G, thence down through a trumpet-guide, H, and, finally, leaving the latter, they go between two delivery-rollers, I I, all being arranged as represented.

The supplementary reeds, the draft, guide, and delivery rollers are suitably supported in a third frame, K, there being in such frame, besides a single set of delivery-rollers, two sets of draft-rollers and a pair of the guide-rollers.

The stop-motion of each of the frames B may be thus described: Its vibrator is shown at *g*. There is fixed on the shaft of the vibrator, at one end thereof, a cross-head, *h*, having pivoted to it two curved levers, *i i*, whose longer arms cross each other and are connected by a spring, *k*. In front of the shorter arms of the said levers is a latch or bent lever, *l*, which is to engage with the shoulder *m* of a slide-rod, *n*, provided with a spring, *o*, for forcing it in a direction toward the latch. Underneath and parallel with the rod *n* is another slide-rod, *p*, which is provided with shoulders *q r*, arranged on it as shown. A forked arm, *s*, is extended down from the rod *n*, and embraces the rod *p* near the inner shoulder, *r*, thereof. Furthermore, from a rock-shaft, *t*, extending along under the frames B K B, three arms, *u v u*, project upward. Each of the arms *u* goes through an eye, *w*, projecting from the rod *p* next it. The middle arm, *v*, goes through an eye, *x*, projecting from a slide-rod, *y*, forked at one end to receive the endless belt used in operating the machinery of the frame K. This belt

goes around a pulley, z, fixed on a shaft, a', arranged in the said frame K. From this shaft a train of gears, b' c' d' e' f', applied to it and the shaft of the draft and delivery rollers, impart motions to such rollers.

Each stop-motion vibrator has mechanism for giving to it a reciprocating rotary motion, which mechanism may be thus described: A rod, g', arranged as shown, and applied to the stop-motion frame so as to be capable of sliding vertically, has projected from it, near its upper end, a stud, h', which enters between the longer arms of the pair of crossed levers i i. At its foot the rod g' is bent at a right angle, and projects into a suitable cam-groove, k', made in the inner side of a pulley or wheel, l', arranged to revolve on a stationary arbor, m'. An endless belt is to go around and impart rotary motion to such wheel.

If, now, we suppose the yarns from both the creels to have in the usual way drop-wires applied to them and the slotted bars of both the stop-motions, and such yarns to be led through the main and along the auxiliary or reducing reeds, and thence to and around the main draft-rollers, and between them and their gravitating or top rollers, and from thence over such top rollers to and down between the pair of guide-rollers, thence through the trumpet-guide, and to and between the delivery-rollers, we shall have the duplex machine in a condition to operate. In case of the breakage of either of the yarns from the creels, the whole machine will be stopped, for the drop-wire of such yarn will fall into the path of the vibrator of the stop-motion to which it pertains, and will arrest the motion of such vibrator, whereby one of the levers i i thereof will be moved so as to force the adjacent latch out of engagement with its slide-rod. On this taking place the helical spring of such rod will move it in a manner to cause the long rock-shaft and its arms to be moved in a manner to effect shifting of the belt from the driving-pulley of the frame K to and upon a loose pulley which may be arranged aside of such driving-pulley.

In practice, not only is each creel to be placed farther from its main reed, but the latter is to be arranged much farther from its reducing-reed than is shown by the drawings.

The several yarns are fasciculated or laid together as they pass between and from the delivery-rollers, from whence they may be suffered to drop into and coil in a can, as is the practice with other kinds of warpers; or they may be received by and wound upon a coiling or bundling reel suitably arranged, constructed, and operated. The construction of such coiling or bundling reel or mechanism and its combination with the warpers I do not claim as my invention, it being, as I have good reason to believe, that of Everett G. Gibson, of Lowell, of the State of Massachusetts, whose application for a patent therefor bears even date with my application for one on the machinery hereinbefore described.

What I claim as my invention is as follows:

1. The combination of the two stop-motions, having the rock-shaft and three arms thereto, as described, with the two sets of main and reducing reeds, the two sets of draft-rollers, and the single set of delivery-rollers, provided with guides or guide-rollers to lead the yarns from the draft-rollers to the said delivery-rollers, all being arranged substantially in manner and to operate as set forth.

2. The combination of the two creels with the two stop-motions, having the rock-shaft and three arms thereto, as described, and with the two sets of draft-rollers and the single set of delivery-rollers, provided with guides or guide-rollers to lead the yarns to them, the said delivery-rollers, from the draft-rollers, all being arranged and to operate substantially as set forth.

3. The combination of a creel, one or more gravitating or drop rollers, the stop-motion, one main and one reducing reed, a pair of draft-rollers, and a pair of delivery-rollers, and suitable guides or rollers to lead the yarns from the draft-rollers to the delivery-rollers, all being arranged and to operate essentially as shown and described.

RICHARD H. PLUMMER.

Witnesses:
E. C. COOKE,
CALISTI DAVIS.