(No Model.) 2 Sheets—Sheet 1.

H. L. MOULTON.

WARP DRESSING MACHINE.

No. 593,486. Patented Nov. 9, 1897.

FIG 1

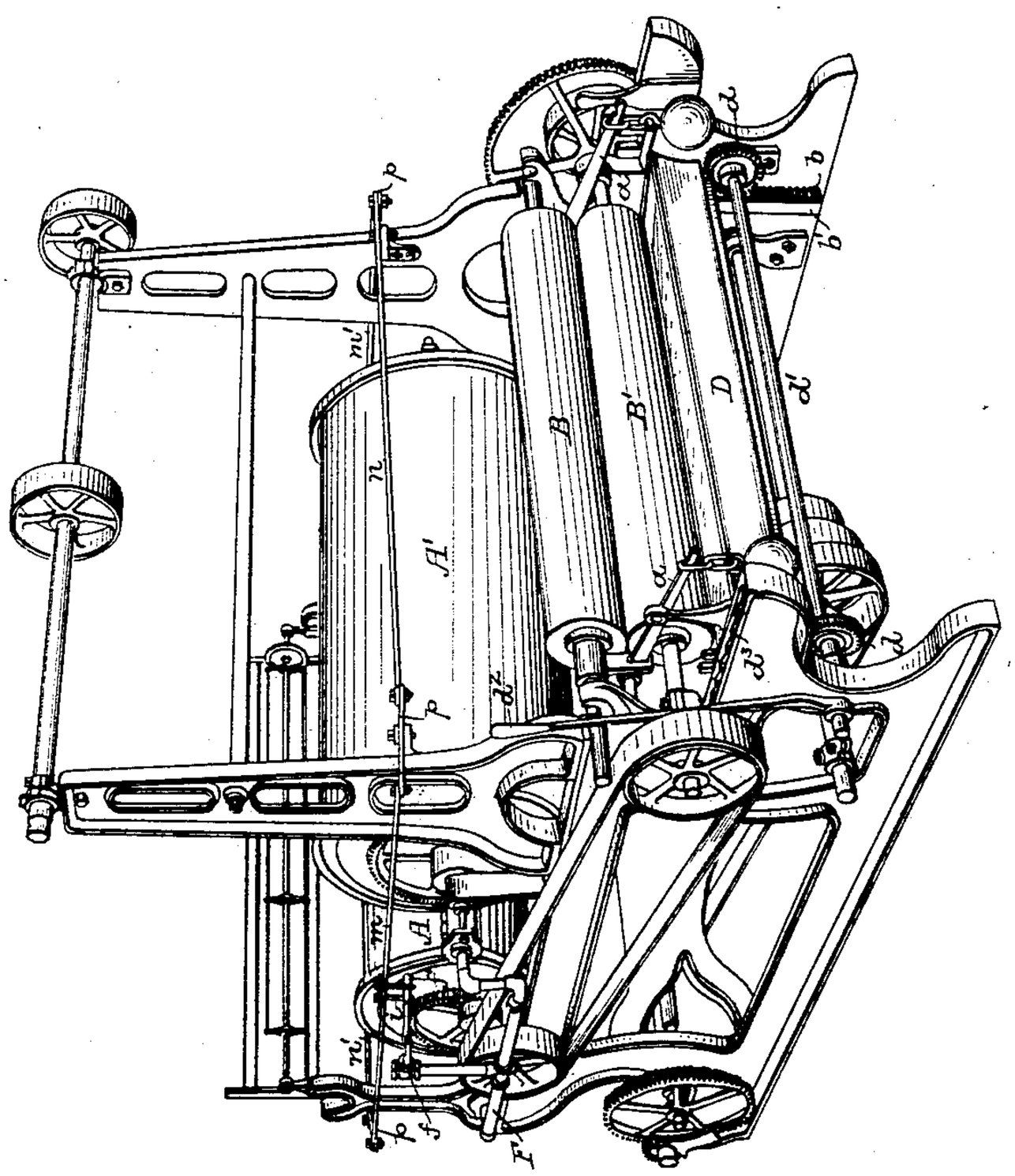
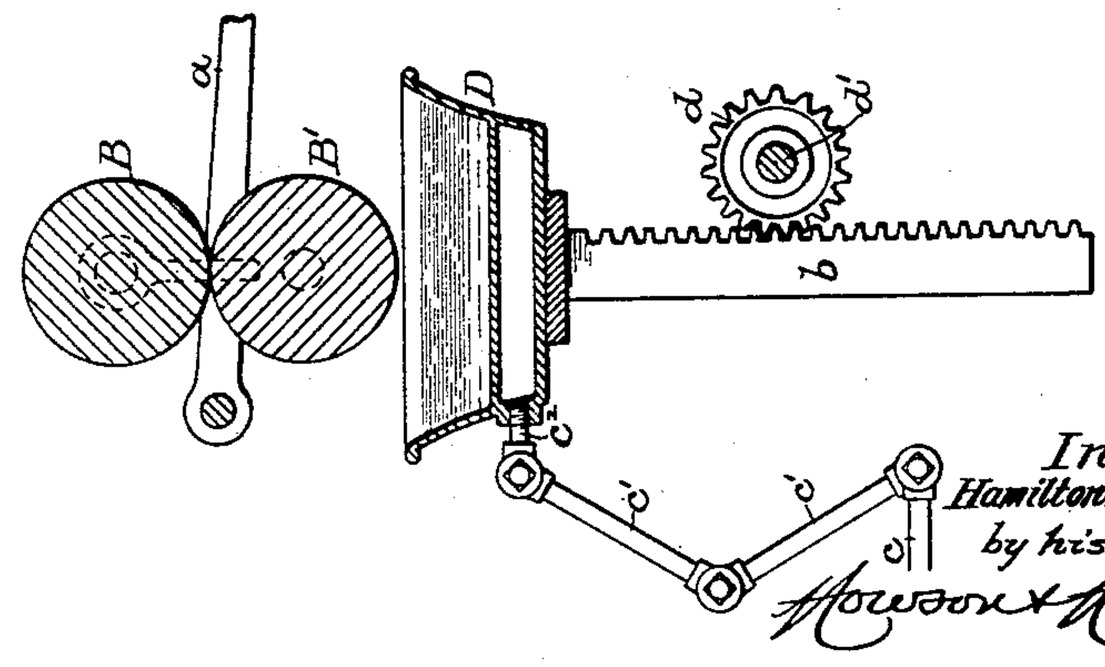


FIG. 5.



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Chas. DeCourt

Inventor:
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(No Model.) 2 Sheets—Sheet 2.

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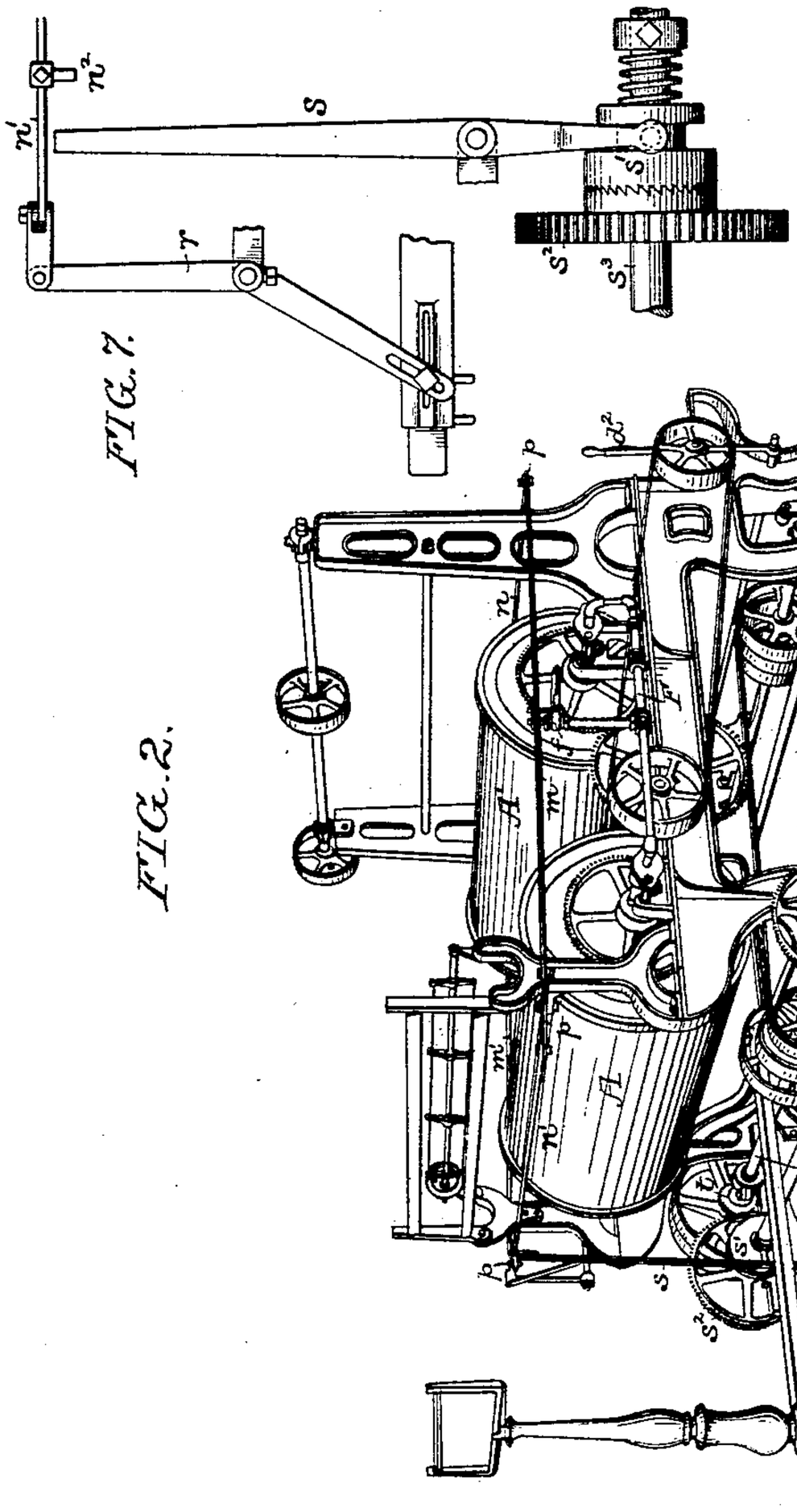

FIG. 2.

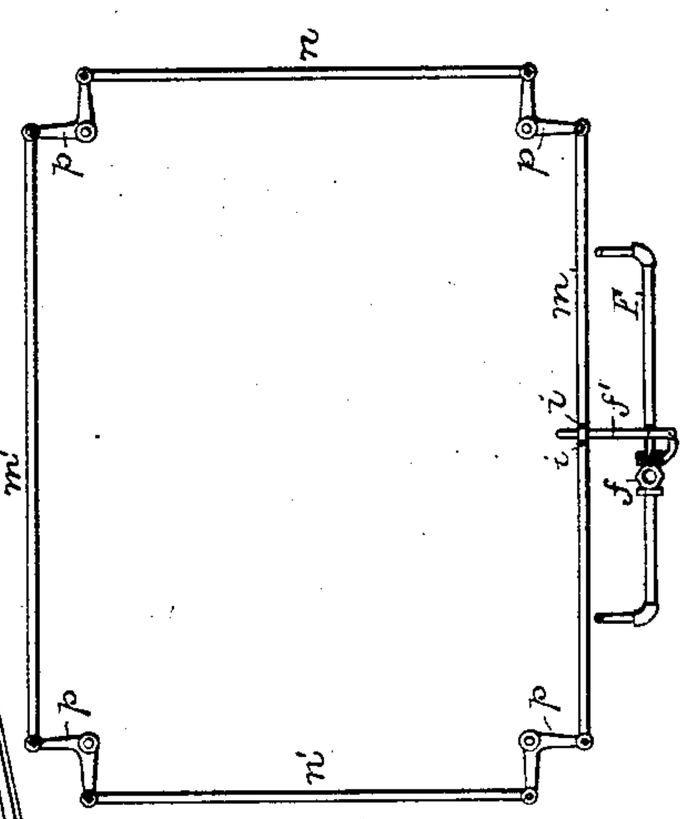

FIG. 3.

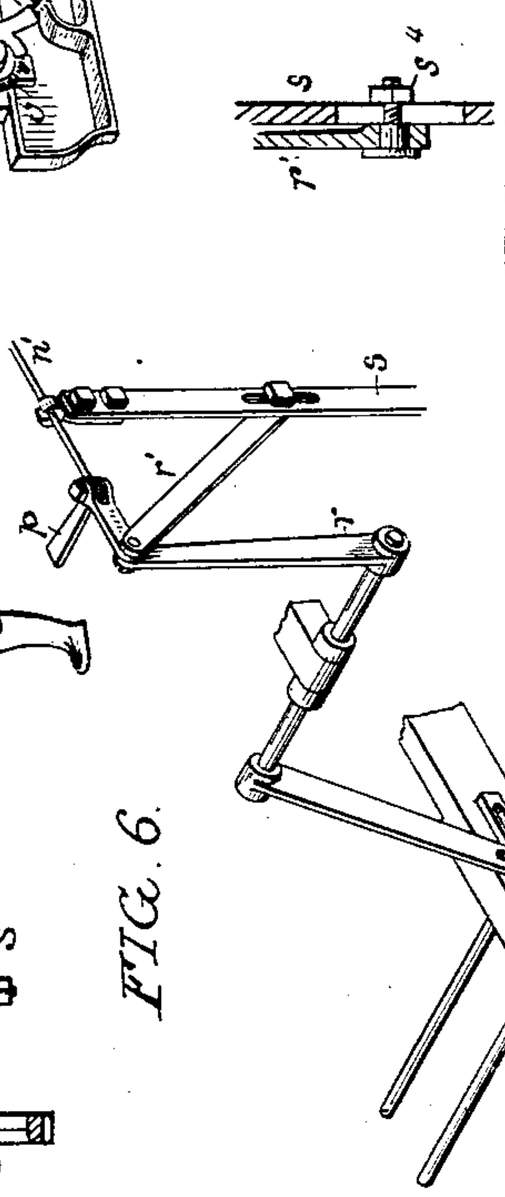

FIG. 6.

FIG. 6a.

FIG. 7.

FIG. 4.

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UNITED STATES PATENT OFFICE.

HAMILTON L. MOULTON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE JAMES SMITH WOOLEN MACHINERY COMPANY, OF SAME PLACE.

WARP-DRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 593,486, dated November 9, 1897.

Application filed January 27, 1896. Serial No. 577,032. (No model.)

To all whom it may concern:

Be it known that I, HAMILTON L. MOULTON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Warp-Dressing Machines, of which the following is a specification.

One object of my invention is to so construct a warp-dressing machine that the speed of the same can be readily decreased, so that piecing of a broken thread or threads can be effected without actually stopping the machine, another object being to regulate the extent of immersion of the lower sizing-roll in the sizing composition and to prevent the caking or hardening of the sizing composition upon said lower sizing-roll when the machine is not in operation. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a warp-dressing machine embodying my invention. Fig. 2 is a similar view looking at the machine from the other end of the same. Fig. 3 is a diagram showing in top or plan view the means employed for stopping or starting the machine and for opening and closing the steam-supply. Fig. 4 is a sectional plan view, on an enlarged scale, of part of the driving mechanism of the machine. Fig. 5 is a longitudinal section of part of the machine, illustrating the sizing-rolls, the size-trough, and part of the mechanism for raising and lowering the latter. Fig. 6 is a perspective view of part of the shipping mechanism for the driving-belt and transmitting-clutch. Fig. 6^a is a sectional view of part of the same, and Fig. 7 is a view illustrating a modification of part of the invention.

The machine in its general construction and operation is similar to warp-dressing machines in common use, and need not be described further than by saying that A A′ represent the hollow steam-heated drying-rolls, having hollow journals adapted to bearings on the main frame and driven by suitable gearing, and B B′ are the sizing-rolls, the lower roll being mounted in bearings on the fixed frame and the upper roll having bearings acted upon by weighted levers *a*, so that it is pressed firmly against the lower roll.

D is the trough, containing the sizing liquid, this trough, when the machine is in operation, being so disposed in respect to the lower sizing-roll B′ that the latter is partially submerged in the sizing liquid and conveys the same to the threads passing between the two sizing-rolls, the sized threads then passing over the drying-rolls A A′. When the size-trough occupies a fixed position, however, the sizing forms a thick coating upon the submerged portion of the lower sizing-roll when the machine is not in operation, and said roll is consequently stationary. Hence when the machine is again started an excess of the sizing composition is applied to the warp-threads, thereby detracting from the uniformity of appearance of the latter and frequently causing the breaking of the warps in weaving, owing to the catching of the hard lumps or knots of size upon the reed. I therefore mount the sizing-trough in such manner that it can be readily raised or lowered, so that when the machine is stopped the sizing-trough may be lowered to such an extent as to carry the level of the sizing liquid below the bottom of the lower sizing-roll, as shown in Fig. 5. The means employed for this purpose are a pair of racks *b*, one near each end of the sizing-trough, these racks being suitably guided in boxes or ways *b′* upon the opposite side frames of the machine and being adapted to engage with pinions *d* upon a transverse shaft *d′*, which is adapted to suitable bearings on the side frames of the machine and has at one end an operating-lever d^2, which is adapted to engage with a notched bar d^3 on one of the side frames, so that it can be readily retained in any desired position of adjustment, the lever having sufficient elasticity to permit it to be sprung laterally out of engagement with the notched retaining-bar when it is desired to lower the size-trough. This construction also provides for gradually raising the size-trough as the amount of sizing composition in the same diminishes, so as to maintain a uniform degree of submergence of the lower size-roller in the composition. The size-trough has a hollow steam-

heated bottom, to which steam is conveyed from a pipe c by means of a pair of pipes c', jointed together where they meet, the lower pipe c' being jointed to the pipe c and the upper pipe c' being similarly jointed to the branch pipe c^2 of the hollow bottom, so that the size-trough can rise and fall without affecting the steam-supply for heating the same. A similar system of pipes provides for the discharge of the water of condensation from the hollow bottom of the trough.

The hollow journals of the rolls A A' are provided with stuffing-boxes for the reception of branches of the steam-supply pipe F, the inlet branch of said pipe being provided with a valve f, whereby the flow of steam may be permitted or cut off, as desired. The stem of this valve is connected to a lever f', which is engaged by pins i, projecting from a rod or bar m, extending along one side of the machine. Another rod or bar, m', extends along the other side of the machine, and these side bars m m' are connected to bars n n' at the front and rear of the machine by means of bell-crank levers p, mounted upon brackets secured to the side frames of the machine at the four corners of the same. By this means I provide a rod extending entirely around the machine and having connection with the valve governing the flow of steam to the drying-cylinders A A', so that the flow of steam to said cylinders can be governed by an attendant standing at any part of the machine. This rod structure is also connected to the slowing down and stopping devices of the machine, so that steam may be partially or wholly cut off from the cylinders simultaneously with the slowing down or stopping of the machine and may be permitted to enter the cylinders again simultaneously with the speeding or starting of the machine. This is effected by connecting one of the rear bell-crank levers p to the upper end of an arm r on the belt-shipper, and also to a bar r', which has a pin adapted to slide in a slot in a lever s, which operates a clutch-sleeve s' and serves to throw the latter into or out of engagement with a clutch-hub formed upon a spur-wheel s^2, the latter turning loosely upon a shaft s^3 and meshing with a pinion t, which is secured to the hub of a pulley t', turning loosely on a shaft t^2, the latter also having a fast pulley t^3. The pin of the bar r' is free to turn therein and has a nut s^4, whereby it can be secured in any desired position in the slot of the lever s, as shown in Fig. 6ª, so that the position of the lever in respect to the shipper-arm r can be altered in order to effect the shifting of the clutch-sleeve s' toward or from the clutch-hub on the wheel s^2, and thus provide for any desired amount of lost motion of said clutch-sleeve. The shaft s^3 is geared by a pinion v and spur-wheel v' to the shaft t^2, and the latter is provided with pulleys, whereby the various other parts of the machine are driven.

When the driving-belt is applied to the pulley t^3, power is transmitted directly to the shaft t^2 and the machine is driven at high speed. When, however, the belt is shifted onto the loose pulley t', the power is transmitted through the reducing-gear described, and the speed of the machine is very much decreased. When the belt is moved from the pulley t^3 onto the pulley t', the clutch-sleeve s' is thrown into engagement with the clutch on the spur-wheel s^2, so that the shaft s^3 will be driven by the latter. In order to stop the machine, the belt is moved backward on the pulley t' until the clutch s' is withdrawn from engagement with that on the spur-wheel s^2, the pulley t' being wider than the pulley t^3, in order to permit this backward movement of the belt thereon.

In the modified construction shown in Fig. 7 the clutch-lever s is fulcrumed between its ends and the upper end of the said lever is struck by a projection n^2 on the rod n', the movement of the belt-shifter so as to transfer the belt from the fast-speed pulley to the slow-speed pulley causing no operation of the clutch-lever, but the excess movement permitted by the width of said slow-speed pulley permitting an operation of the clutch-lever so as to release the clutch without removing the belt from the pulley.

By slowing down the machine provision is afforded for piecing broken threads without arresting the travel of the warp over the drying-cylinders. Hence I avoid the formation of stripes across the warp, which is likely to result when portions of the sized warps are subjected to the action of the drying-cylinders for a much longer time than other portions.

By cutting off steam from the drying-cylinders A A' simultaneously with the slowing down or stopping of the machine I prevent the burning or scorching of the sized threads, which might result if hot cylinders remained in contact therewith for a considerable time.

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

1. A warp-dressing machine in which are combined the hollow drying-cylinders, a pipe for supplying steam thereto, a valve for controlling the flow of steam through said pipe, a rod structure extending around the machine and having connection with said valve, a belt shipper-arm, a lever controlling a clutch forming part of the driving mechanism of the machine, and means for connecting said rod structure to said shipper-arm and clutch-lever, substantially as specified.

2. The combination of the sizing-rolls, the vertically-adjustable size-trough having a chambered bottom, a fixed steam-pipe, a branch pipe communicating with said hollow bottom, and a pair of connecting-pipes having a swinging joint where they meet, one of said pipes being likewise jointed to the fixed steam-pipe and the other to the branch pipe of the sizing-trough, substantially as specified.

3. The combination of the fast and slow

speed pulleys of the machine, a slow-speed mechanism having a clutch and clutch-lever, a shipper for moving the belt from one pulley to the other, and connections between said belt-shipper and the clutch-lever, said slow-speed pulley being of such width that movement of the belt in excess of that necessary to clear the fast-speed pulley is permitted, whereby the clutch can be thrown out of engagement without removing the belt from the slow-speed pulley, substantially as specified.

4. The combination of the fast and slow speed pulleys of the machine, a slow-speed mechanism having a clutch, a clutch-operating lever, a belt-shipper, and connections between the belt-shipper and clutch-lever whereby the clutch is thrown into action on shifting the belt from the fast-speed pulley to the slow-speed pulley, said slow-speed pulley being of such width that movement of the belt in excess of that necessary to clear the fast-speed pulley is permitted, whereby the clutch can be thrown out of engagement without removing the belt from the slow-speed pulley, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HAMILTON L. MOULTON.

Witnesses:

JOS. H. KLEIN,

FRANK E. BECHTOLD.