3 Sheets—Sheet 1.

J. S. WINSOR.

Cloth-Drying Machine.

No. 207,329 Patented Aug. 20, 1878.

Fig. 2.

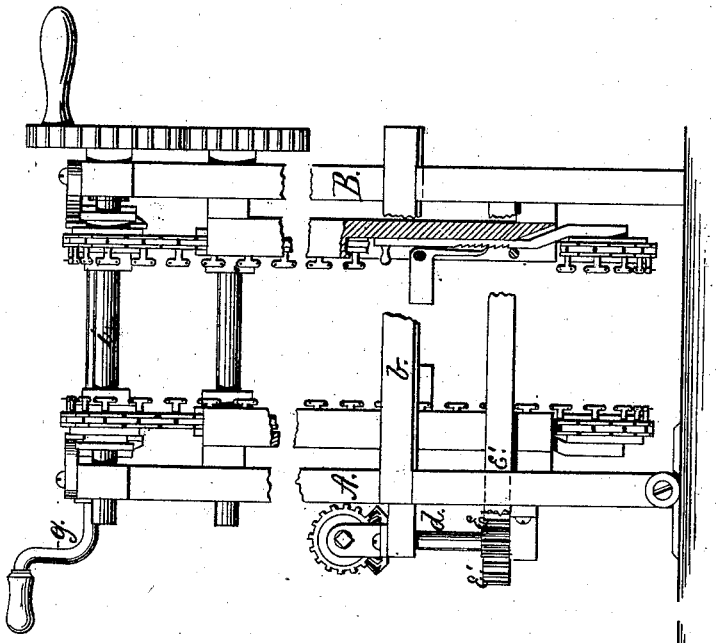

Fig. 1.

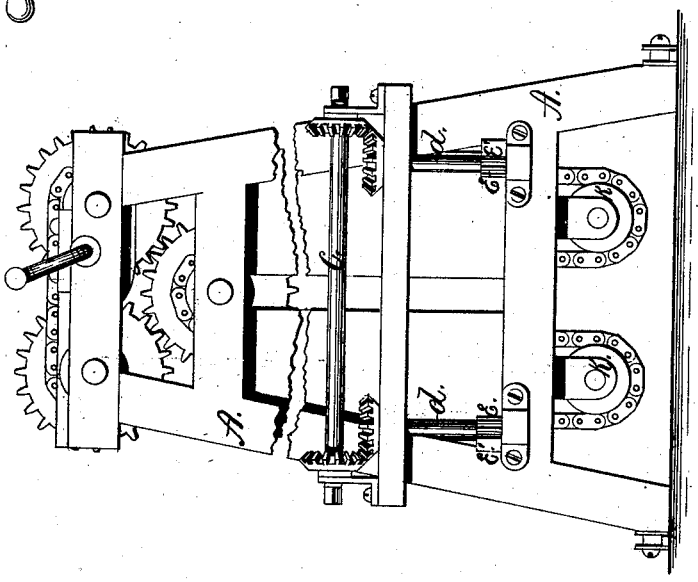

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Fig. 4.

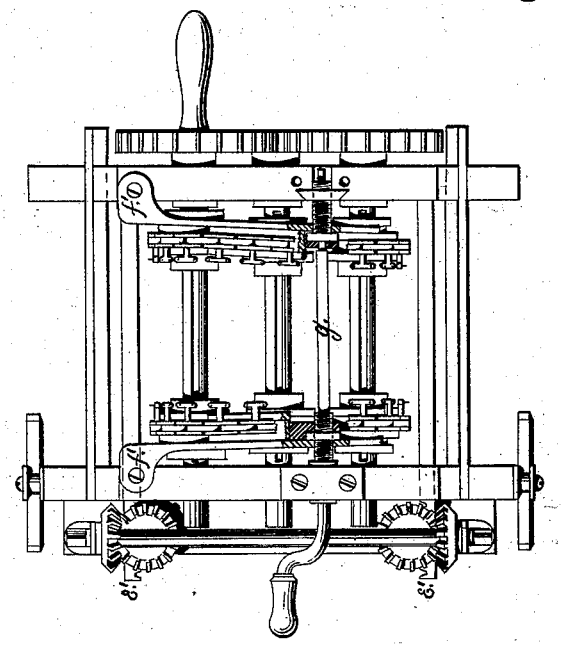

Fig. 3.

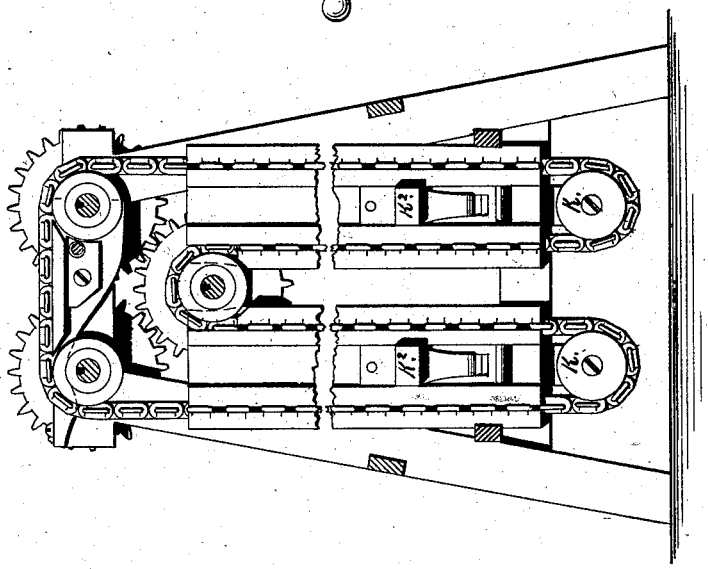

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Fig. 5.

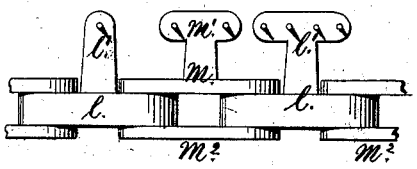


Fig. 6.

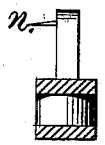


Fig. 7.

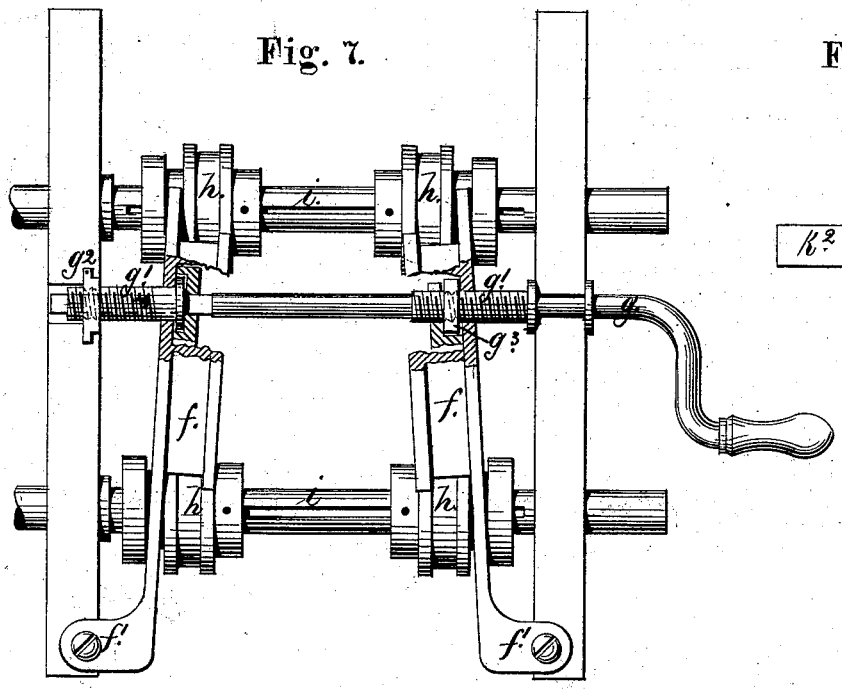
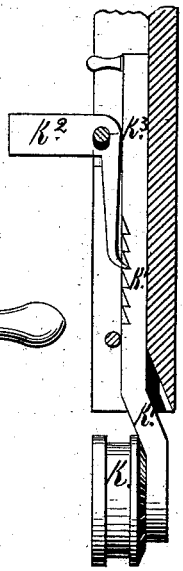


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOSEPH S. WINSOR, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN CLOTH-DRYING MACHINES.

Specification forming part of Letters Patent No. **207,329**, dated August 20, 1878; application filed February 18, 1878.

To all whom it may concern:

Be it known that I, JOSEPH S. WINSOR, of the city and county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Cloth-Drying Machines; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to cloth-drying machines in which the cloth is carried on endless chains through a vertical chamber exposed to currents of heated air.

It consists, first, in the peculiar and novel manner in which the sides of the chamber and the tenter-chains can be separated, more or less, and the machine adjusted to the width of the cloth to be dried; secondly, in the peculiar method of regulating the chain-guides so that the cloth can be stretched to regain the shrinkage and still allow the width to be freely adjustable; and, thirdly, in the peculiar means by which the endless chains are held at the proper tension without straining the same, as will be more fully set forth hereinafter.

Figure 1 is a side view of the machine, showing the gears and rack and pinion by which the sides are adjusted to the proper width of the cloth to be dried. Fig. 2 is an end view, partially in section, showing the endless chains, the sliding guides holding the lower chain-wheels, as also the rack and pinion, for lateral adjustment. Both figures are shown as broken off near the center, to indicate that in practice the machine is much higher than shown in the drawings, usually extending through one or more stories of a building. Fig. 3 is a sectional view, showing the chain and guides in a two-loop machine. In practice any number of loops of chain may be used, so that the cloth may remain a long time in the drier and still move at a rapid speed into and from the same. Fig. 4 is a top view of the machine. Fig. 5 is a view of the peculiar chain used in these machines, and Fig. 6 is a side view of the same. Fig. 7 is an enlarged view of the stretching device, and Fig. 8 is a view of the sliding guide, to which the lower chain-wheel is secured, and the pawl and ratchet by which it is held.

In the drawings, A is one of the side frames of the machine, and forms the adjustable side of the vertical chamber within which the cloth is to be dried. This side frame A can be brought nearer to or farther from the other stationary side, B, so as to adjust the width of the machine to the width of the cloth, and thus confine the heated air and compel it to pass along the cloth.

b represents guides or slides, by which the two side frames are connected. C is a horizontal shaft, secured in bearings connected with the adjustable side frame A, and provided at each end with a bevel-gear arranged to gear into a bevel-gear on the vertical shafts *d*, the other ends of which vertical shafts are provided with pinions E, arranged to gear into the racks E′. Only one rack is shown on each side in the drawings; but the shafts *d* may extend the whole or any desired portion of the whole height, and any number of pinions E may be arranged to gear into a corresponding number of racks, E′, and thus, by turning the shaft C with a wrench, crank, or other device secured to the squared ends of the shaft, the whole side A may be readily moved to any desired width and the apparatus adjusted to the width of the cloth, so that the heated air will be brought into contact with the cloth, and not allowed to escape at the sides of the same, which it would do if the shaft were not adjusted to the width of the cloth by bringing the sides together.

f f are the horizontal chain-guides, hinged at *f′*, and arranged to be adjusted to the width of the cloth when received and to impart the desired amount of stretch to the same by means of the crank-shaft *g*, which is secured by collars to one of the side frames, and provided with two screw-threads, g^1, one of which turns in nut g^2 secured to the frame, and the other in a nut, g^3, secured to one of the chain-guides, the shaft itself being laterally secured in the other chain-guide by a collar. On examining Fig. 7 it will be observed that both the screws on the shaft *g* are right-handed screws, and that by turning the crank-shaft *g* in either direction the two chain-guides are moved simultaneously in opposite directions, and that this is owing to the fact that one of the nuts is secured to the frame and the other

to the adjustable chain-guide nearest the crank, while the shaft is laterally secured in the other chain-guide; and to allow for the lateral adjustment the end of the crank-shaft is made to slide freely in the screw g^1, which enters the nut g^2 in the frame A.

h h are the chain-wheels, secured to the shafts i i by means of splines and keys, or in any other convenient manner, by which the same are free to slide laterally on the shaft and yet turn with the same.

k k are the lower adjustable chain-wheels, supported in the slides k^1, and held in position by the weighted pawl k^2 entering the ratchet on the slide k^1. The weighted pawl k^2 is hinged on a pin, k^3, and the hole in the pawl is made oval or sufficiently enlarged so that the slide can give to any strain on the chain, thus allowing sufficient slack to prevent unnecessary strain, and yet securing the chain-wheel in its proper position, which cannot be done by a spring or weight, as these are liable to give too much and allow one chain to gain upon the other, and thus strain the cloth diagonally.

The chain is of peculiar construction, and arranged to slide through the guides. It is made of a set of links, l, the base of which forms the center link of the chain, and the projecting arm l' projects outside the guides, and is provided with one or more pins, n, which enter the cloth and carry the same along with the chain up and down through the drying-chamber. Another set of links, m, forming one side of the chain, is provided with a shorter arm, m^1, on which also one or more pins, n, are arranged to enter the cloth. m^2 is an ordinary flat chain-link. Rivets are secured in the outer portion of the chain in the links m and m^2, arranged to pass through the link l and turn loosely in the same.

The whole drying apparatus is inclosed, the upper portion properly ventilated, and heat supplied at the bottom, so as to produce a current of heated air. The cloth enters the machine at the top, passes over the same, and is stretched so as to acquire the desired width, being held by the pins in the chain. It is then carried down, up again, and so on up and down until it is taken off near the place it first entered. In the drawings two loops of chain are shown, but any desired number may be used, for the longer the endless chain the more cloth will be contained in the drying-chamber, and the longer will it be subjected to the drying process at a given speed of delivery, or the more rapidly can the same be delivered perfectly dry.

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

1. The combination, with the adjustable side frame A, of the racks E′, pinions E, shafts d d and C, the shafts being connected by beveled gears arranged to adjust the width of the drying-chamber, substantially as described.

2. In combination with the frame A, hinged chain-guides f f, and chain-pulleys h h, the shaft g, carrying the screws g^1 g^1, one of which is rigidly secured to the shaft, the other being free to slide thereon, and the nuts g^2 g^3, whereby the stretch of the cloth is regulated and provision is made for adjusting the frame, as and for the purpose set forth.

3. The combination, with the slide k^1, provided with a chain-wheel, k, and a ratchet, of the weighted and hinged pawl k^2, arranged to support said slide, substantially as and for the purpose described.

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