

No. 678,136.

Patented July 9, 1901.

C. W. RUSSELL.
CLOTH DRYING MACHINE.

(No Model.)

(Application filed Apr. 7, 1900.)

2 Sheets—Sheet 1

FIG. 1.

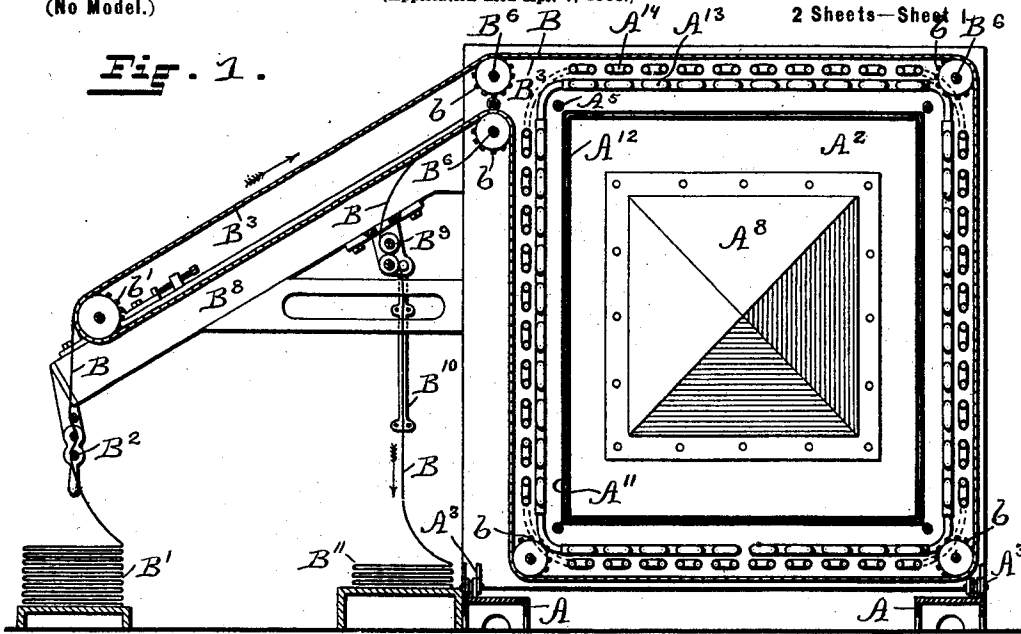


FIG. 2.

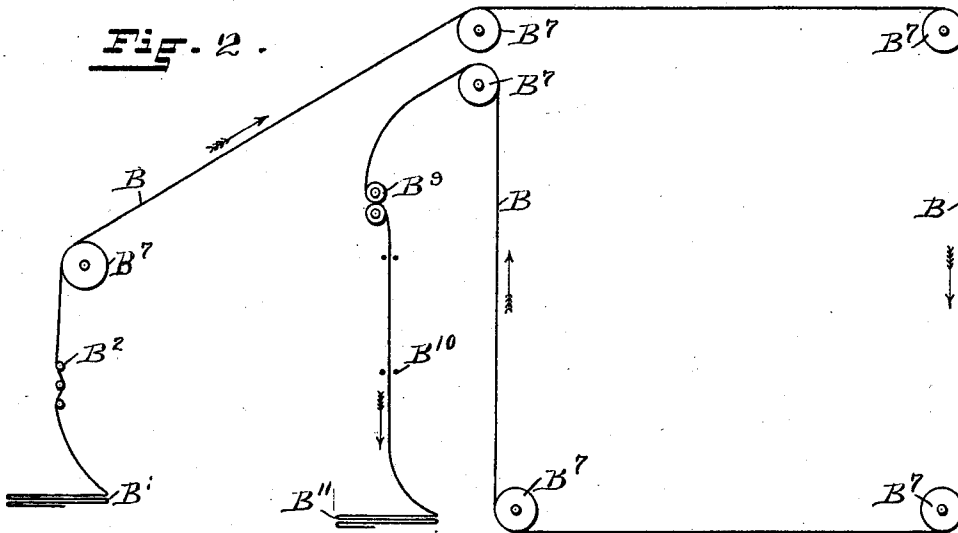


FIG. 3.

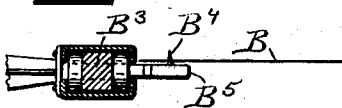
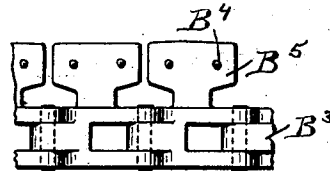


FIG. 4.



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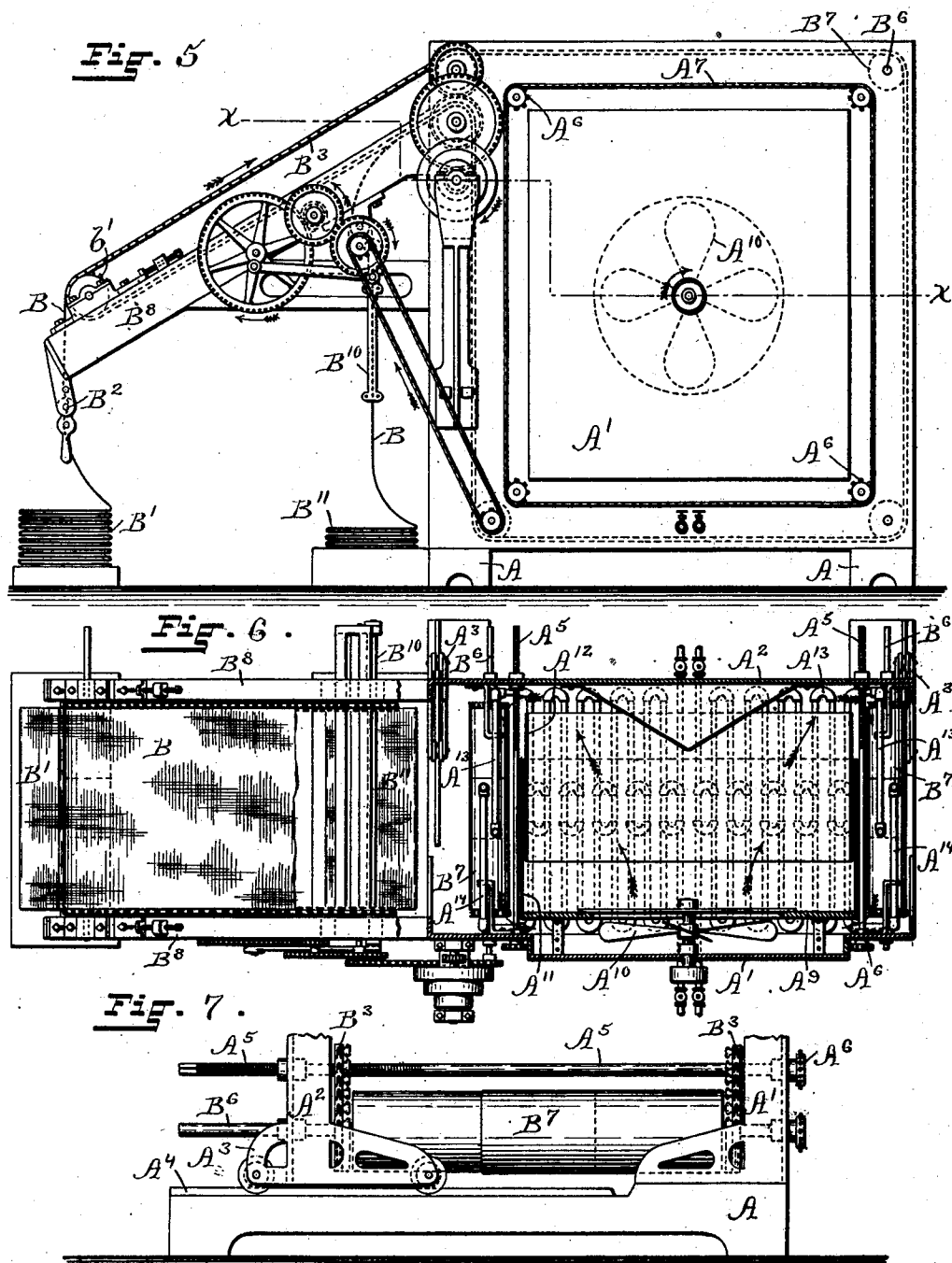
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UNITED STATES PATENT OFFICE.

CHARLES WARD RUSSELL, OF PROVIDENCE, RHODE ISLAND.

CLOTH-DRYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 678,136, dated July 9, 1901.

Application filed April 7, 1900. Serial No. 11,945. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WARD RUSSELL, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Cloth-Drying Machines, of which the following is a specification.

This invention has reference to an improvement in machines for drying cloth; and it consists in the peculiar and novel construction and the combination of parts more fully described hereinafter.

To secure the rapid drying of cloth, heat has to be applied to facilitate the rapid evaporation of the water and air to remove the vapor from the cloth. The machines used for drying cloth may be divided into fan drying-machines, in which the cloth is passed around (usually revolving) cylinders, and steam-coil drying-machines, in which the air is heated by the steam-coils and passed through or among the cloth. In fan drying the direct contact of the cloth with the heated cylinders imparts a stiffness to the cloth similar to ironing, while in the steam-coil machines a great deal of heat is wasted and a long frame is required to secure the drying of the cloth in one passage through the frame.

The main object of my invention is to economize space and steam, while more thoroughly drying the cloth, as will be more fully set forth hereinafter.

My improved machine is adapted to woolen, linen, cotton, and other cloth of different widths. The cloth may be stretched and tented during its passage through the machine, and a swissing motion may be given to the cloth, if desired.

Figure 1 is a longitudinal sectional view of my improved cloth-drying machine. Fig. 2 is a diagrammatic view showing the path of the cloth in its passage through the machine. Fig. 3 is a transverse sectional view of the chain cloth-carrier. Fig. 4 is a top view of part of the chain cloth-carrier. Fig. 5 is a side view, and Fig. 6 is a top view, partly in section, of my cloth-drying machine, taken on the line X X of Fig. 5. Fig. 7 is a partial end view showing, on an enlarged scale, the means for adjusting the machine to the various widths of cloth.

Steam-coils radiate heat in all directions, and when cloth is passed over or alongside of such steam-coils only a part of the radiated heat affects the cloth. In my improved cloth-drying machine I direct all the radiated heat against the cloth by means of a reflector-plate placed on the side of the coil opposite the cloth. To economize space, I carry the cloth in a rectangular path around the coils and outside of a rectangular space inclosed by the reflector-plates. As far as I am at this time aware I am the first to use these two features in a cloth-drying machine.

Similar marks of reference indicate corresponding parts in all the figures of the drawings, in which—

A A indicate the sills on which the machine is supported, A' the fixed side rigidly secured to the sills A A, and A² the adjustable side provided near each end with a carriage A³, the wheels of which, preferably grooved, rest and move on the ways A⁴ on the upper side of the sills A A. The side A² is connected with the side A' by means of the (preferably four) shafts A⁵ A⁵, rotatably secured and held against longitudinal movement in bearings supported in the fixed side A'. The shafts A⁵ A⁵ are screw-threaded for part of their length and are in screw-thread engagement with the adjustable side A². To secure the uniform adjustment, the shafts A⁵ are each provided at the end journaled in the fixed side A' with a sprocket-wheel A⁶, and all the sprocket-wheels are connected with each other by the sprocket-chain A⁷. To one of the sides, preferably the adjustable side A², the pyramidal deflector A⁸ is secured, and to the opposite side the partition A⁹, provided with a central opening, is secured. The fan A¹⁰ is mounted in bearings supported by the side A' and the partition A⁹. The fan A¹⁰ is provided with a driving-pulley or other means for rotating the fan. The central portion of the machine is inclosed by a casing which, to permit of the adjustment of the machine to varying widths of cloth, is made telescopic, the part A¹¹ of the casing being secured to the side A' and the part A¹² to the adjustable side A². The casing is made of sheet metal, preferably provided with a polished outer surface, so as to reflect the heat.

Two series of steam-coils surround the cas-

ing. The series A¹³ is connected with one side and extends beyond the middle of the machine when adjusted to its greatest width. The series of coils A¹⁴ is connected with the other side of the machine and overlaps the series A¹³. The steam-coils A¹³ and A¹⁴ are placed between the central casings A¹¹ and A¹² and the cloth B. The cloth B is taken from the pile B' and, passing between the friction-bars B², is connected along the opposite selvage edges to the chain B³ by the pins B⁴ on the brackets B⁵, extending from the inner side of the links of the endless chain B³. Instead of the pins B⁴ on the chain the chain may be provided with any one of the forms of cloth-clamps used on cloth-drying machines. The endless chain B³ is guided and supported on the sprocket-wheels *b b*, secured to the shafts B⁶ B⁶, on which the cylinders B⁷ are supported. The cylinders B⁷ B⁷ telescope one part into the other part, so as to permit of the longitudinal adjustment to the width of the cloth and serve to support the cloth between the endless chains. The endless chains B³ B³ pass over the sprocket-wheels *b b* in carrying the cloth through the drying-machine proper and also pass over the sprocket-wheels *b' b'*, supported in sliding bearings secured to the bracket B⁸, one side of which is laterally adjustable, so as to adjust the same to different widths of cloth, and also obliquely adjustable, so as to stretch the cloth in its passage to the rectangular part of the drying-machine. After passing around the four sides the cloth is taken off from the chain by the rollers B⁹ and, passing through the plaiting-frame B¹⁰, is folded on the coil B¹¹, as is indicated by the arrows in Fig. 2. The air is driven by the fan A¹⁰ through the central chamber and directed by the pyramidal deflector A⁸ around the open ends of the casing, as is indicated by the arrows in Fig. 6, into the space between the cloth and the casing of the central chamber, in which the steam-coils are located, and is drawn from the opposite end of this space by the fan. The heat from the coils is radiated directly to the cloth from one side of the coils, and the heat from the other side of the coils is reflected by the casing. The air, passing around and among the steam-coils in the contracted space, passes over the inner surface of the cloth and also through the cloth. The steam-coils heat the cloth and vaporize the water contained in the cloth without touching the cloth, and the currents of heated air absorb the vapors so rapidly that in one passage through the drier the cloth may be thoroughly dried.

I have shown in Figs. 5 and 6 driving mechanism for operating the machine; but I do not wish to confine myself to any particular means for driving the same.

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

1. A cloth-drier having a central chamber,

a fan on one side of the chamber, an air-passage around the margin of the opposite side of the chamber, steam-coils disposed around the central chamber, and means for carrying the cloth around the steam-coils, as described.

2. A cloth-drier having two sides, means supported on the sides for carrying the cloth around the drier and between the sides, a central chamber open at one side and the walls of which form with the cloth an annular space, and steam-coils disposed in the annular space between the walls of the central chamber and the cloth, as described.

3. A cloth-drier having two sides, means for carrying the cloth around the drier, a central chamber the walls of which form with the cloth an annular space, steam-coils in the annular space, a fan-blower in one side of the central chamber, and openings on the margin of the opposite sides of the central chamber communicating with the annular space, whereby the heat is concentrated in the annular space and the air brought in contact with the cloth, as described.

4. In a cloth-drier, in combination, a fixed and an adjustable side adapted to adjust the drier to the width of the cloth, a cloth-carrier, a telescopic central chamber connected with the opposite sides, a fan-blower in the fixed side of the telescopic central chamber, a pyramidal deflector opposite the fan-blower, and two sets of steam-coils, one connected with each of the sides, whereby the parts adjust themselves automatically when the drier is adjusted to the width of the cloth, as described.

5. In a cloth-drier, the combination with the side A' rigidly secured to the supporting-sills, of the side A², the carriages A³ A³ the ways A⁴, the shafts A⁵ A⁵, and means for simultaneously operating the shafts A⁵ A⁵, whereby the width of the drier may be adjusted to the width of the cloth, as described.

6. In a cloth-drier having a central chamber, steam-coils outside of the central chamber and cloth-carrying chains extending around and outside of the steam-coils, of an extension of the chain, and adjustable guides for the chain, whereby the cloth to be dried may be stretched, as described.

7. In a cloth-drying machine, the combination of the following instrumentalities: two vertical sides, cloth-carriers supported on the sides near the margin, a central chamber the walls of which form with the cloth an annular space, steam-coils in the annular space, a fan on one side of the inner chamber, a pyramidal deflector on the other side of the chamber, openings connecting the space within the central chamber with the annular space, and a cloth-stretching device, whereby the cloth is dried by passing around the central chamber and outside of the steam-coils, as described.

8. In combination in a cloth-drier, the two vertical sides of the drier, means for adjust-

ing the sides to the width of the cloth, two
cloth-carriers, supports for the cloth-carriers,
a central telescopic chamber, steam-coils ex-
tending from each side, each beyond the
5 other, and one outside of the other, a fan-
blower on one side of the central telescopic
chamber, and mechanism for actuating the
cloth-carriers; whereby the cloth is carried
around the margin of the machine and a

greater length of cloth exposed in less space, as described.

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

CHARLES WARD RUSSELL.

Witnesses:

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A. E. HAGERTY.