(No Model.) 4 Sheets—Sheet 1.

F. G. & A. C. SARGENT.

WOOL DRIER.

No. 307,873. Patented Nov. 11, 1884.

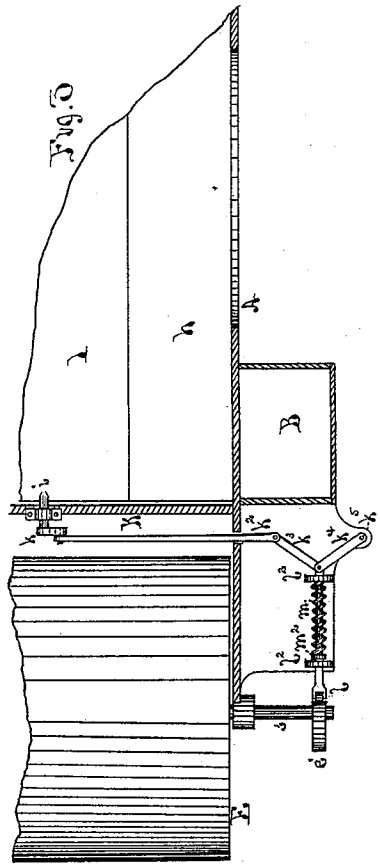

Fig. 2.

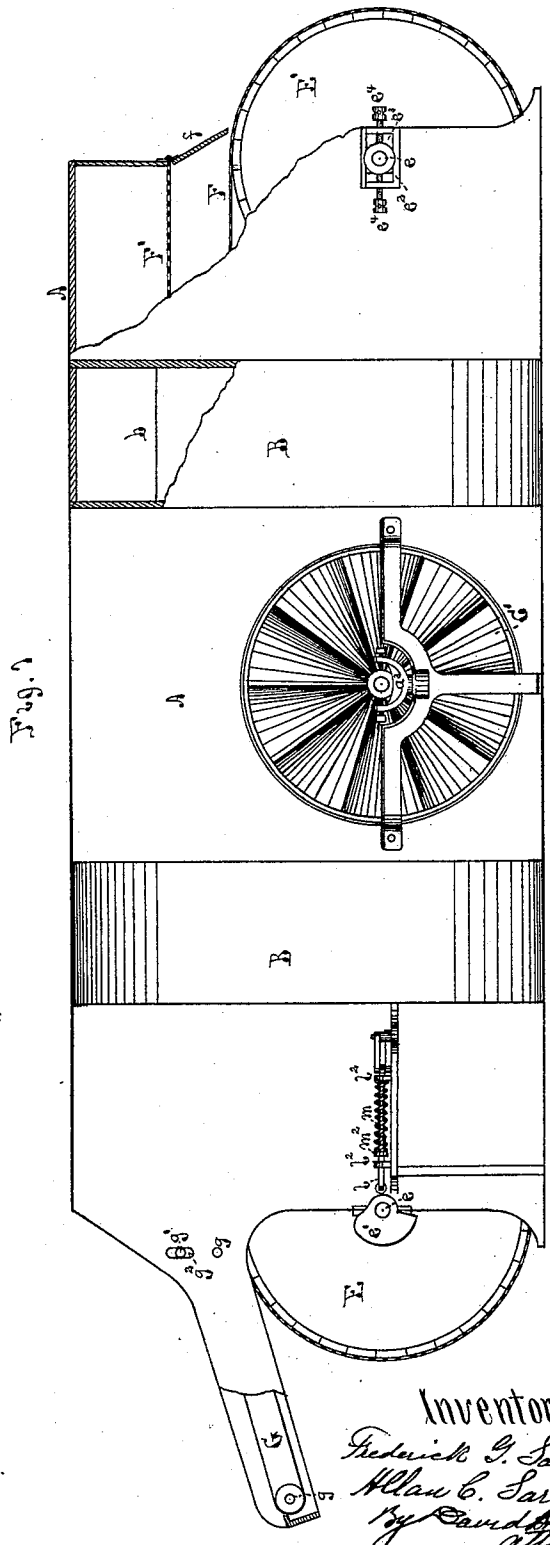

Fig. 1.

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(No Model.) 4 Sheets—Sheet 2.

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WOOL DRIER.

No. 307,873. Patented Nov. 11, 1884.

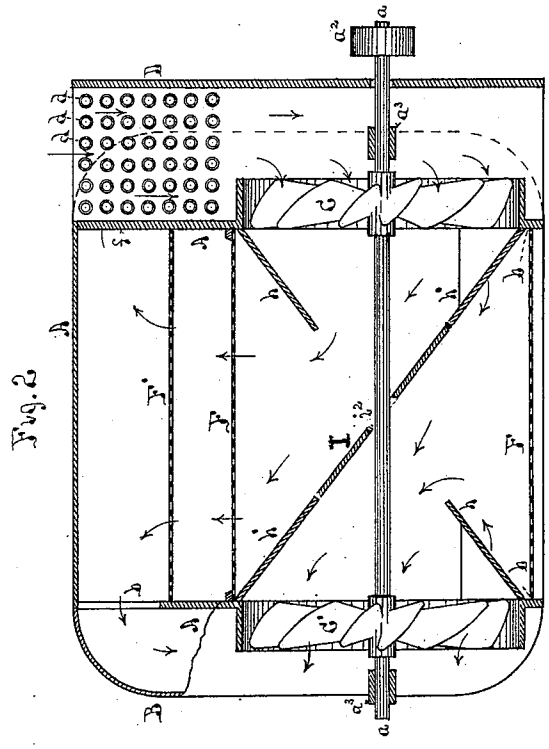

Fig. 2.

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WOOL DRIER.

No. 307,873. Patented Nov. 11, 1884.

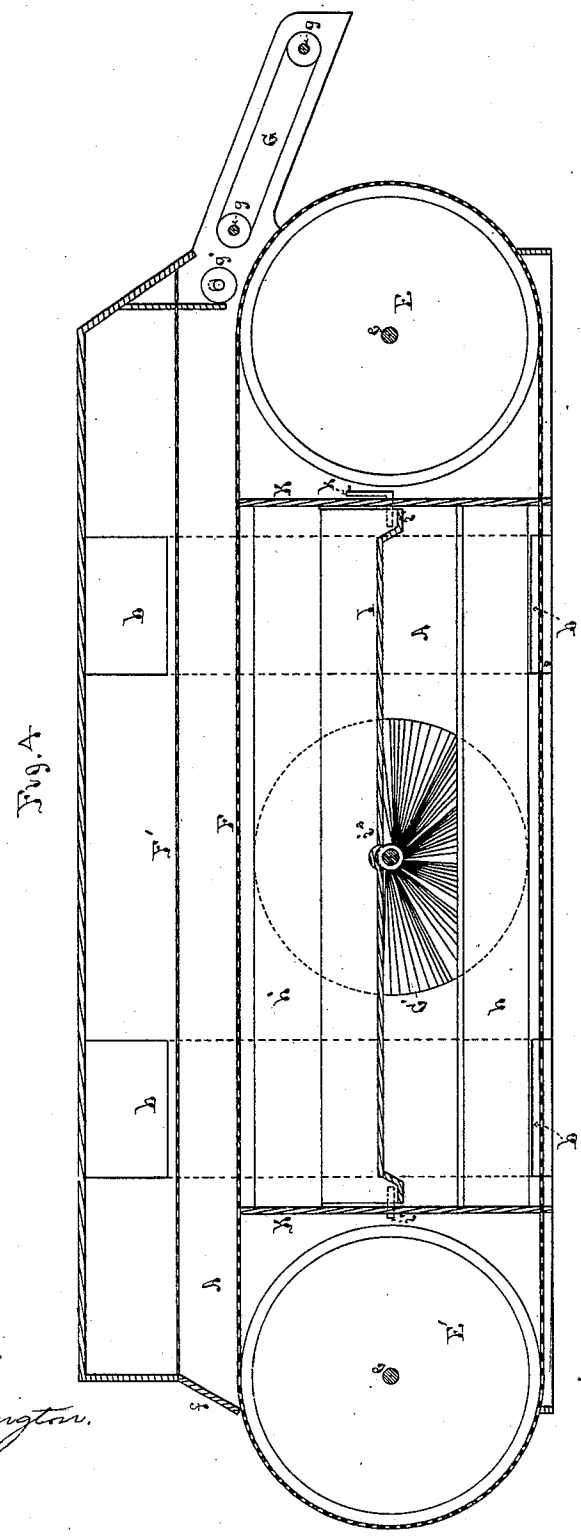

Fig. 4.

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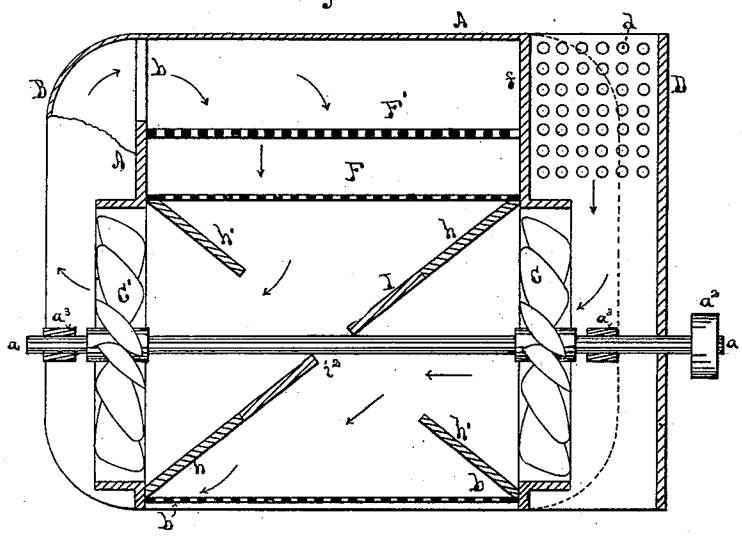
WOOL DRIER.

No. 307,873. Patented Nov. 11, 1884.

Fig. 5



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UNITED STATES PATENT OFFICE.

FREDERICK G. SARGENT AND ALLAN C. SARGENT, OF GRANITEVILLE, MASSACHUSETTS.

WOOL-DRIER.

SPECIFICATION forming part of Letters Patent No. 307,873, dated November 11, 1884.

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

To all whom it may concern:

Be it known that we, FREDERICK G. SARGENT and ALLAN C. SARGENT, of Graniteville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Wool-Driers, of which the following is a specification.

Our improvement relates to machines for drying wool; and it consists in the novel arrangement of parts, substantially as hereinafter described.

In the drawings, Figure 1 represents a side elevation of the machine with parts of the casing broken away to show the working parts. Fig. 2 is a transverse vertical section of the same through the axis of the fans. Fig. 3 represents a portion of the machine with the top removed to show the automatic apparatus for working the damper. Fig. 4 is a central vertical longitudinal section of the machine. Fig. 5 is the same as Fig. 2 with the damper reversed.

This machine is of the kind in which the fiber is carried through it upon a traveling perforated apron, and in which the currents of air are driven through the fiber alternately upward and downward to loosen up and dry it more effectually.

A is the casing of the machine.

B B are air-passages formed on the outside of the casing, and leading from above the perforated aprons which inclose the fiber to a chamber below such apron. These passages connect with such chamber by openings at *b b* at top and bottom. A shaft, *a*, extends transversely across the machine, and has upon one end a driving-pulley, a^2, to revolve it. It is supported in boxes a^3, secured to the casing, as shown. Where the shaft passes through the casing, circular holes are cut in the latter on each side axial to the shaft, and of considerable diameter. Nearly filling these holes, and mounted upon the shaft, are two fans, C C′, one of which is adjusted to force the air into the machine and the other to draw it out.

Covering or surrounding the fan C at one side of the machine is a passage, D, inclosing it on the sides and fitting tightly against the casing of the machine, but open at the top to allow for the admission of air. The upper part of this tubular passage is filled with steam-pipes *d d*, between which the air must pass in entering it, and the pipes being filled with steam, the air is thus highly heated before entering the machine.

The arrows indicate the direction of the current of air.

E E′ are two drums placed near the ends of the machine, and mounted on axes *e e* extending transversely across it. The drum E′ has its axis supported in boxes e^2, which are capable of moving back and forth in slots e^3 in the casing of the machine, and are secured in any desired position by the set-screws e^4 e^4. The purpose of these boxes, slots, and set-screws is to bring a strain upon the perforated apron which extends around the drums E E′ and cause it to be held horizontally on top, where it sustains the fiber. This perforated apron F is endless, and is moved by the revolution of the drums E E′. This apron passes on its lower side through horizontal slots in the vertical partitions K K, as shown in Fig. 4, which allow it to traverse through them freely, but prevent the escape of the air-currents.

F′ is a second perforated apron secured horizontally in the frame of the machine a short distance above and parallel to the upper surface of the apron F, and the apron F′, while it allows the air to pass through it freely, prevents the fiber from being carried off by it when passed upward through the aprons.

G is a feeding-apron to carry the fiber into the machine, passing around rollers supported upon the axes *g g*.

Upon the axis *g′* is mounted a roller, which yields upward and downward in slots g^2 in the ordinary manner, and serves to admit the fiber, while preventing the escape of air. The construction and operation of this roller are well known.

At the lead-out end of the machine the yielding flap or apron *f*, hinged at its top edge to the casing, allows the fiber to escape, while preventing escape of the current of air. This flap is made of some heavy material to hold it down, if desired.

Between the upper and lower horizontal portions of the apron F, as it passes around the drums, are four diagonal partitions, *h h* and *h′ h′*, secured at their outer edges firmly to the casing A, and extending at the ends and joining to partitions K, which are attached to the outer casing, A, at their ends, and extend transversely and vertically across and fill the

entire space between said upper and lower traveling portions of the apron F. These diagonal partitions *h h h' h'* are of equal breadth, and the space between their opposite edges is the same at all points in them. A damper, I, is mounted on bearings *i* in the partitions K K, and is of just sufficient breadth to fill the space between the edges of either pair of diagonally-opposite partitions, *h h* or *h' h'*, as shown in Fig. 2. Where the shaft *a* passes through this damper, a slot, i^2, of a breadth and length to allow the shaft to pass freely, is made in it. The bearings *i* are in the same right line with the center of the slot i^2 and with the axis of the shaft *a*, and are at the longitudinal center of the damper, and are secured firmly in the damper, so as to turn with it. On the end of one of these bearings, Fig. 3, is attached a crank, *k*, to which is connected the rod k^2, extending through the casing of the machine, and to its outer end is pivoted the link k^3, to which is in turn pivoted the link k^4, which is attached at the other end by a pivot, k^5, to the frame of the machine. The pivot, which joins k^3 and k^4, passes through one end of a rod, *l*, which plays back and forth through holes in the ears l^2 l^2, connected to the frame-work.

Between the ears, and surrounding the rod *l*, is a spiral spring, *m*, which bears against the collar m^2, attached to the rod *l* at one end of the spring and against the ear l^2 at its other end, and thus holds the rod against a cam, *e'*, attached to the shaft *e* of the drum E. The rod *l* has its end which bears against the cam rounded to avoid friction. The length of the links k^3 k^4 and the position of the crank *k* and rod k^2 are so adjusted that when the spring *m* holds the rod *l* against the cam *e'*, as shown in Figs. 1 and 3, the damper I will close the space between two of the diagonally-opposite partitions *h h*. When, however, the cam *e'* is revolved and the rod *l* is forced toward the links k^3 k^4, the latter expand their ends and move the rod k^2 and crank *k*, so as to revolve the damper I a quarter-revolution on its axis and close the space between the other two diagonally-opposite partitions, *h' h'*. The drums E E' are revolved by a pulley or gearing of any ordinary construction, attached to the shaft of one of them.

The operation of the machine is as follows: The air passes into the mouth of the spout D, and, being heated by the steam-pipes *d*, is drawn inward by the fan C and forced into the machine. The damper being in the position shown in Fig. 2, the air passes upward through the aprons F F' and into the tubes B B at their top ends, and thence downward and out of them at the bottom ends into the space on the opposite side of the damper I and partitions *h' h'*, and thence outward through the fan C' and out of the machine. The fan C' has been drawing the air out of the machine during the time that the fan C was forcing it in, and a double power is therefore exerted upon the current of air by the two fans at the same time. As the drum E continues to revolve and the apron F to carry the fiber through the machine, the cam *e'* forces the damper I to revolve on its bearings and close the space between the diagonally-opposite partitions *h h* by means of the rod *l*, links k^3 k^4, rod k^2, and crank *k*, and the air, being forced inward by the fan C, now passes into the bottom ends of the tubes B B, thence up through them to the space above the perforated aprons F' F and downward through these, and, striking against the opposite side of the damper I and partitions *h h*, passes outward through the fan C', as before. The effect of thus alternately passing the air upward and downward through the fiber is to shake it open and dry every part of it more rapidly, and the rapid alternation of these upward and downward currents greatly assists in this operation. This is accomplished automatically by the quarter-turning of the damper I upon its bearings; and the entire machine is very durable and simple in operation. One fan only may be used instead of two, if desired.

We do not claim anything set forth and claimed in the application for Letters Patent filed by us October 12, 1882, No. 74,069; but the mechanisms hereinbefore described are improvements upon that shown in said application.

What we claim as new and of our invention is—

1. The combination, in a fiber-drying machine, of the perforated aprons F F', one or more air-passages, B, leading from the upper to the lower sides of said apron, the reversible damper I, and the fan C, substantially as described.

2. The combination, in a fiber-drying machine, of the traveling perforated apron F, one or more air-passages, B, leading from the upper to the lower side of said apron, the damper I, and the fan C, substantially as described.

3. The combination, in a fiber-drying machine, of two fans, one forcing the air-current into the machine and the other drawing said air-current out of the machine, with the perforated aprons F F' and the damper I, connected with said aprons by suitable air-passages leading from above to below the same, and adapted to reverse the current of air through said aprons, substantially as described.

4. The combination, in a fiber-drying machine, of the perforated aprons F F', one or more air-passages, B, leading from above to below said aprons, the reversible damper I, the fan C, and the pipe D, provided with steam-pipes *d d*, substantially as described.

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