

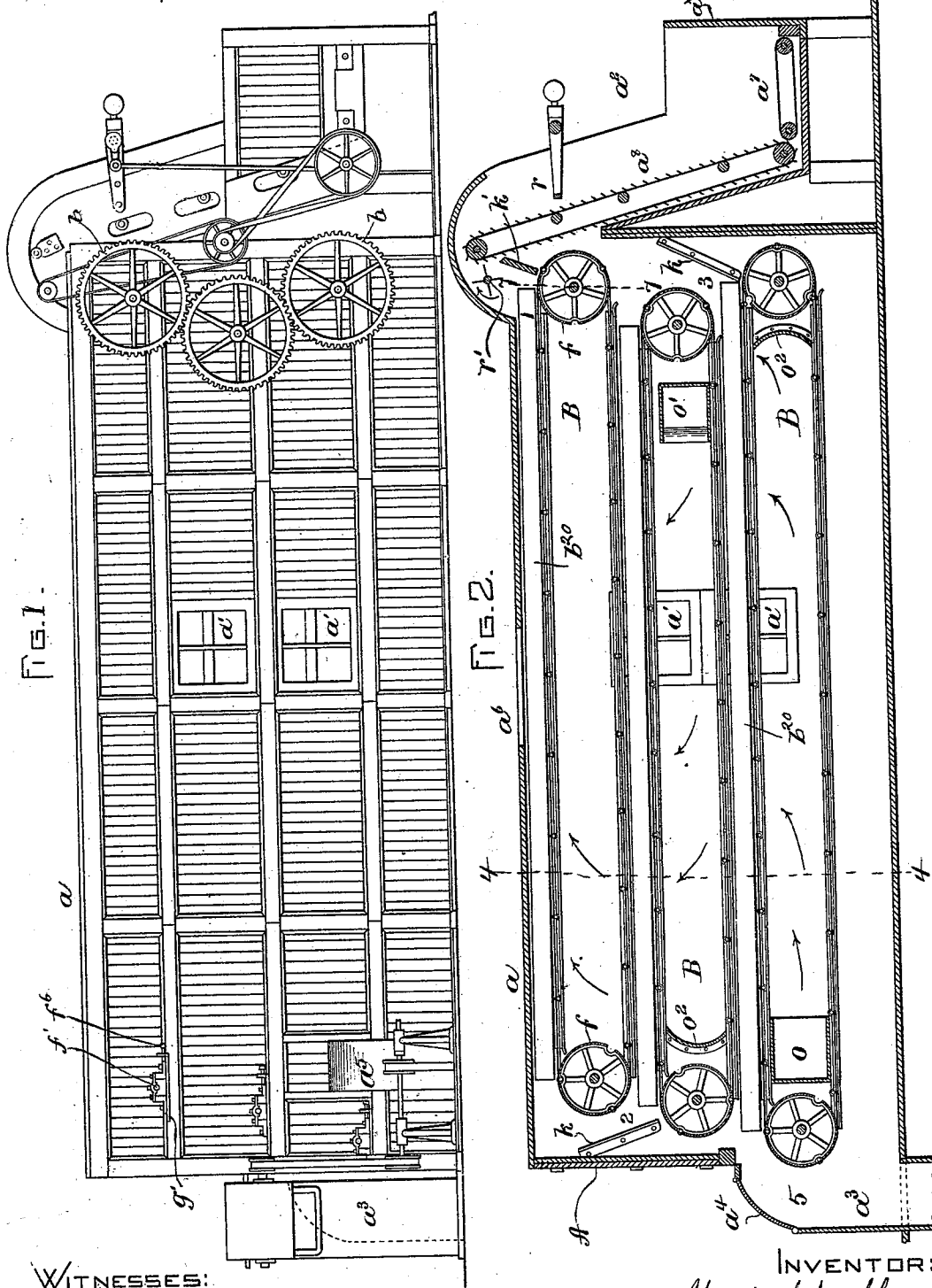
(No Model.)

4 Sheets—Sheet 1.

C. SCHREBLER.
WOOL DRYING MACHINE.

No. 554,838.

Patented Feb. 18, 1896.



WITNESSES:
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INVENTOR:
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4 Sheets—Sheet 2.

No. 554,838.

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Fig. 3.

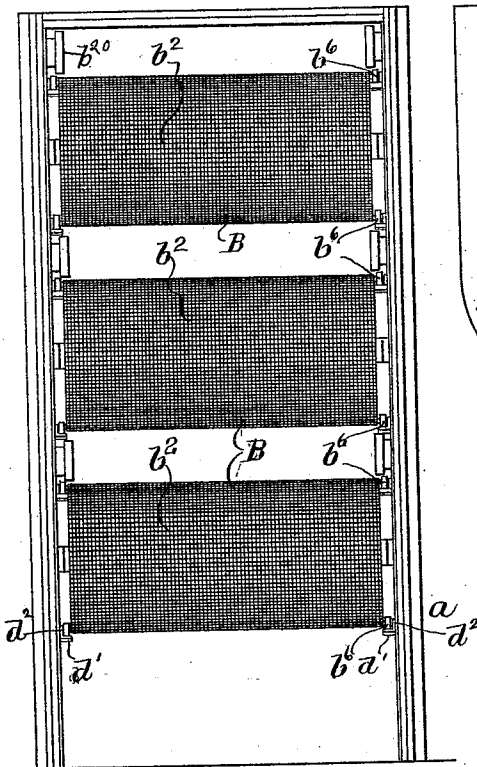


Fig. 4.

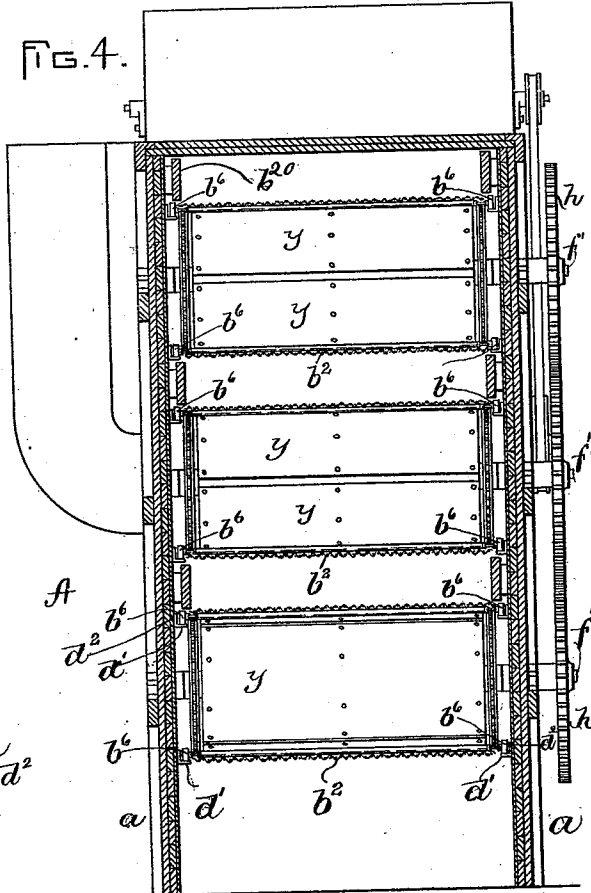
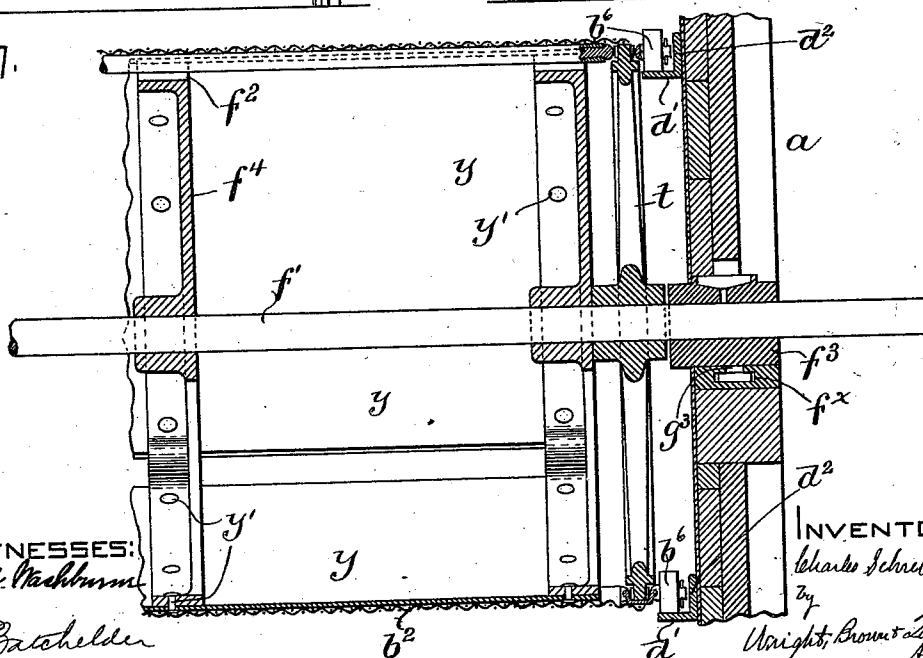


FIG. 7.



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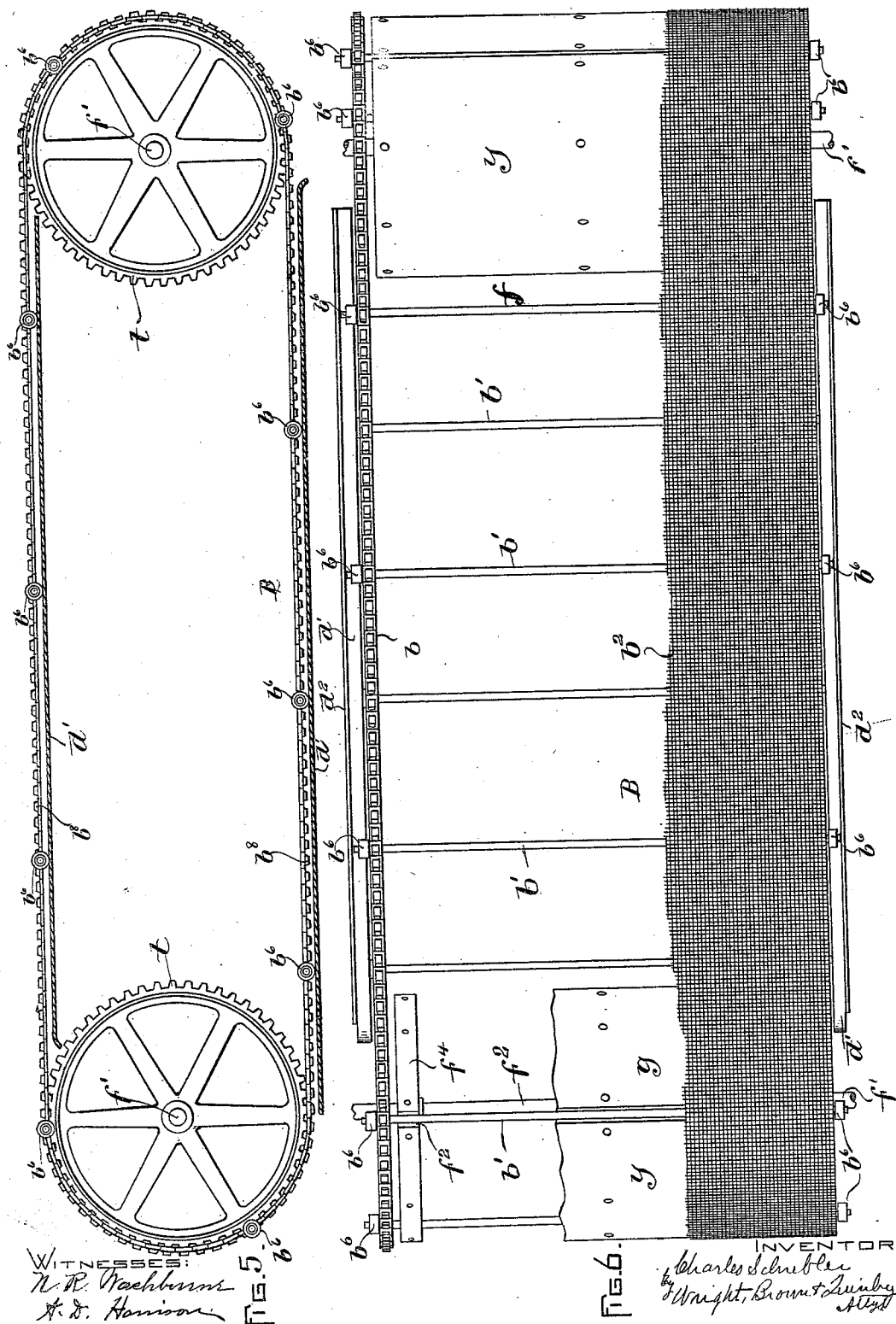
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4 Sheets—Sheet 3.

No. 554,838.

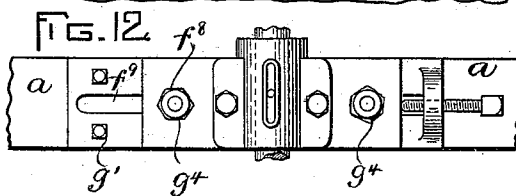
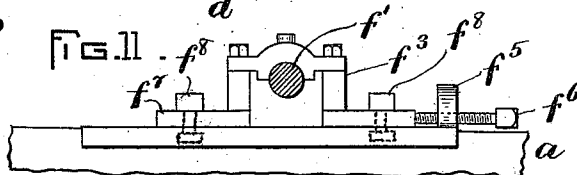
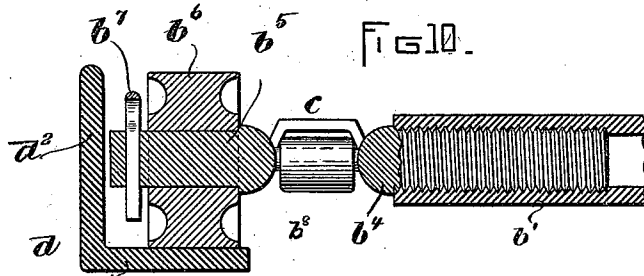
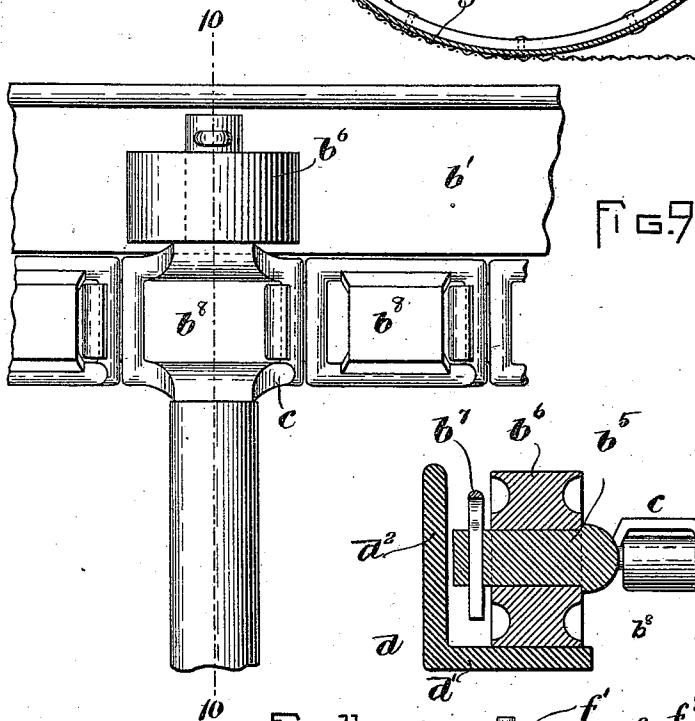
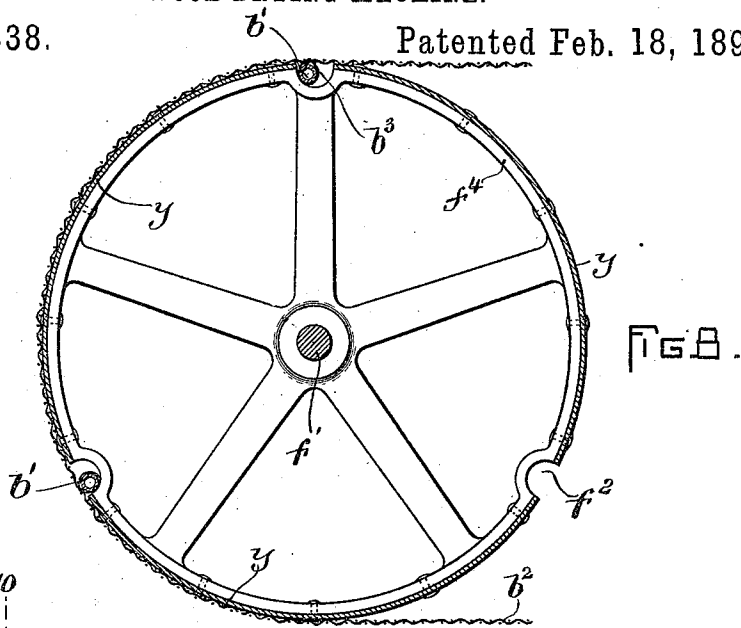
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C. SCHREBLER.
WOOL DRYING MACHINE.

No. 554,838.

Patented Feb. 18, 1896.



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UNITED STATES PATENT OFFICE.

CHARLES SCHREBLER, OF LAWRENCE, ASSIGNOR OF ONE-HALF TO FRED HARTLEY, OF NEWTON, MASSACHUSETTS.

WOOL-DRYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 554,838, dated February 18, 1896.

Application filed January 3, 1895. Serial No. 533,735. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SCHREBLER, of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Wool-Drying Machines, of which the following is a specification.

This invention relates to an improvement in machines for drying wool or other fibrous material; and it consists in the novel features of construction and arrangement of parts hereinafter fully described in the specification, clearly illustrated in the drawings, and particularly pointed out in the claims.

Reference is to be had to the accompanying four sheets of drawings, forming a part of this application, in which like characters indicate like parts wherever they occur.

Figure 1 represents a side elevation of a machine made in accordance with my invention. Fig. 2 is a vertical longitudinal section of Fig. 1. Fig. 3 is an end elevation of the machine shown in Fig. 2, the casing of the machine being removed to show the arrangement of the aprons. Fig. 4 is a vertical section on the line 4 4 of Fig. 2. Fig. 5 is a side elevation of one of the endless aprons and the sprocket wheels and chain. Fig. 6 is a top plan view of Fig. 5. Fig. 7 is a detail sectional view on the line 7 7 of Fig. 2. Fig. 8 is a detail view of the apron-supporting drums. Fig. 9 is a detail view of the cross-rods and a novel form of sprocket-link having a roller on one end and a screw-threaded boss upon the other. Fig. 10 is a detail sectional view on the line 10 10 of Fig. 9. Fig. 11 is a side elevation of the means for adjusting the tension of the carrying-aprons. Fig. 12 is a top plan view of Fig. 11.

In the drying of wool it is desirable that the process be carried on with as little heat as possible and that the wool be evenly distributed to the action of the current of air to prevent bunching. When bunches are formed either the interior of these bunches is not dried, or if sufficient heat is maintained to dry the interior of the bunches then the fiber of the wool that is not bunched or packed is practically cooked, thus materially injuring the strength and texture thereof.

To dry wool to the best advantage it must

be subjected to the action of a current of heated air in such a way that the air is compelled to sift through the wool instead of pushing it aside and bunching it, thus leaving bare spots on the apron, through which most of the heated air will pass instead of being sifted through the wool. The wool or other fiber should be dried with as little heat as possible, and the air around the wool should be continually changed to prevent sweating. In machines as at present constructed the hot-air pipes are placed between the aprons. This is an objection by reason of its creating more heat than is necessary and otherwise interfering with the circulation of the air. The aprons, moreover, are heavy. Stationary rollers for supporting the aprons soon become clogged. The aprons being heavy sag of their own weight, and the parts required to support them are in the way of the wool as it is delivered from the aprons and require more or less knock-off mechanism to be used at the ends of the machine to keep the wool from becoming clogged.

By my invention I am enabled to dry the wool or other fiber by using only about one-third of the pipe-surface now used. These pipes are not arranged in the machine proper, but at any desired distance therefrom, and a blower is employed to conduct the heated air from said pipes to the machine and force it through the wool out of the machine at the top, the arrangement being as near as possible to the natural drying of wool were it exposed outdoors to the action of the atmosphere. The current of air is so directed in the machine and the aprons are so arranged to hold the wool that it cannot become bunched or pushed aside, the air being compelled to sift through the wool, thus making it light and fluffy.

A machine constructed in accordance with my invention avoids the disadvantages heretofore mentioned, can be made at a comparatively small cost, and the parts are light and not liable to get out of repair.

Referring to Figs. 1, 2, 3, and 4, A represents my improved machine inclosed in a suitable casing or framework *a*. This casing is provided with windows *a'*, through which the condition of the interior of the machine may

be seen at any time. α^2 represents an automatic feeding device consisting of a hopper α^x , at the bottom of which is a horizontal feeding-apron α^7 . An inclined lifting-apron α^8 is arranged to take the stock as it is delivered from the apron α^7 and deliver it to the aprons B. A vibrating comb r is arranged in proximity to the lifting-apron α^8 for evening the stock carried up by the lifting-apron, preventing bunches and undue quantities of material from being delivered to the aprons B. A fan or doffer r' is employed to knock the material off the lifting-aprons onto the aprons B.

α^5 represents flues arranged to conduct a current of heated air from a blower (not shown) to the air-ports $o\ o'$, whereby a current of heated air may be forced through the wool carried by the aprons and out through the opening α^6 at the top. The aprons B are mounted one above the other upon drums f secured on shafts f' . These drums are offset from one another, so that as the material leaves one apron it will fall upon the apron immediately below it.

$o\ o'$ are air-ports connected by the flues α^5 to the blower and extending a considerable distance between the upper and lower sides of the aprons B and arranged to direct the current of air between the upper and lower sides of the lower aprons. At the opposite end of the aprons from the openings $o\ o'$ are deflecting-plates o^2 . The air is forced through these openings along the apron and up through the same, and that portion of the air which goes to the opposite end of the apron strikes the deflecting-plates and is also forced up through the apron, all as indicated by the arrows.

Guide-plates k are arranged to guide the material as it leaves an upper apron, so that it will fall properly upon the apron immediately below it. There is a similar guide-plate k' under the doffer r' .

α^3 represents an opening through which the wool or other material passes out of the machine.

The wool enters the machine at the point indicated by the numeral 1, passes along said apron, is delivered to the apron immediately below at the point indicated by the numeral 2, leaves this last-mentioned apron, and is delivered to the third apron at the point indicated by the numeral 3, and leaves the machine at the point indicated by the numeral 5. The number of aprons is not material, three being here shown.

α^4 represents a cover or shield by which access may be obtained to the interior of the casing.

The aprons B are arranged in comparatively close proximity to each other, the top of one apron traveling in the same direction as the bottom of the apron immediately above it. The aprons are arranged to hold the wool between them, and the air entering the air-ports and being forced along in the direction of the arrows opposite to the direction of the

traveling aprons breaks up the wool, sifts through it, and leaves the machine at the opening α^6 . The air being forced in the direction opposite to the travel of the aprons instead of across the aprons, and the wool being held by the aprons, there is no opportunity for its being brushed aside or becoming bunched.

The shafts f' upon which the drums f and the sprocket-wheels t are mounted are provided upon one end with spur-gears h that intermesh with each other whereby the drums are driven in unison. One of these shafts is provided upon the opposite end of the spur-gears h with any suitable means for receiving motion from some convenient driving-shaft. (Not here shown, as it forms no part of my invention.) The drums f are composed of a series of disks f^4 secured on the shaft f' . Upon these disks are secured by rivets or any suitable fastening means y' a covering y , the disks and the covering being provided at suitable intervals with longitudinal grooves f^2 spaced to correspond with rods b' upon the aprons. These rods b' enter the depressions or grooves in the drum so that the covering of the apron rests upon the surface of the drum. The ends of the shafts f' are mounted in adjustable bearings f^3 . (See Figs. 7, 11 and 12.) These bearings f^3 are mounted to slide upon a plate g secured by bolts g' to the framework or casing a of the machine. This plate g has an upwardly-projecting lug f^5 provided with a screw-threaded aperture through which an adjusting-screw f^6 passes. The bearing f^3 is secured to the plate g by means of bolts f^8 passing down through a flange f^7 on said bearing and into a slot f^9 in the plate g . These bolts are provided with heads f^x , which are engaged by lips g^3 on the plate g , whereby the bolts are prevented from being withdrawn. The set-screws f^6 are arranged between the shafts f' and are designed to force the shafts away from and toward each other for the purpose of adjusting the tension of the chains. When it is desired to adjust the tension of the chains the nuts g^4 in the bolts f^8 are loosened, the set-screw turned until the desired tension is established, then the nuts are tightened upon the bolts f^8 , and the bearings f^3 secured in such position.

The aprons B are composed of a covering b^2 , preferably of woven wire or any perforated material, secured upon rods b' by any suitable fastening means b^3 . These rods are secured at their ends in sprocket-chains b . Antifriction-rollers d^6 are mounted upon the sprocket-chains and arranged to travel in an angular-shaped track d to support the apron and at the same time prevent lateral play thereof. The rods b' are preferably hollow and provided at their ends with internal screw-threads. The links of the sprocket-chain b to which the rods b' are attached are constructed as shown in Figs. 9 and 10. The link has the usual opening for the spur of the sprocket-wheel, and is provided with a cap-

piece b^3 . Integral with one side of said link there is an exterior screw-threaded stud b^4 arranged to be engaged by the screw-threads on the rod b^1 . Integral with the other side of
 5 said link there is a trunnion b^5 on which an antifriction-roller b^6 is mounted and retained by a pin b^7 . An inspection of Fig. 10 will show the construction and arrangement of these parts and also the arrangement of the
 10 track d , where the bottom d^1 of said track serves to support said rollers and said apron, and the sides d^2 of said track prevent lateral play thereof, the track being secured by any suitable means to the casing a . As the apron
 15 between the drums is supported by the rollers b^6 there is no obstruction to the passage of the air. Moreover, an apron so constructed is very light, it cannot sag, and there are no parts to become clogged.

20 Attention is particularly called to the preferred form of covering for the apron—to wit, wire-netting—and to the several elements of the apron and the way the aprons are arranged with respect to each other, and also
 25 to the manner in which the air is circulated. By my improved construction I am enabled to obtain an apron that is very light and at the same time rigid, and by the construction and arrangement of the several parts of the
 30 machine I am enabled to dry wool thoroughly at a comparatively low temperature by utilizing a comparatively small amount of pipe-surface for heating. The advantages of a machine constructed in accordance with my
 35 invention will readily suggest themselves to those skilled in the art without further description.

Attention is called to the sprocket-chains, the manner of connecting the apron there-
 40 with and the adjustable bearings for the shafts. By this arrangement any desired tension can be placed upon the chains without putting any strain upon the covering of the apron, the said covering being secured to the
 45 rods or to the links, or both, by any desired fastening means. Since this covering has very little weight to support—that of the superimposed wool—it can be made very light for the reason that it is subjected to no strain.
 50 Moreover, since this covering and the weight of the wool together are very light, the structure of the entire apron may be made light owing to the novel arrangement of the parts whereby the strain is taken off from the cov-
 55 ering of the apron and carried by the chains.

Guards b^{20} are arranged on the top of each apron and at each side thereof. These guards extend lengthwise of the machine for the distance occupied by the apron. They are at-
 60 tached in any desired way to the framework of the machine, and are arranged to extend out beyond the sprocket-chains to the edge of the covering b^2 , as shown in Figs. 3 and 4. The edges of these guards are arranged to
 65 just clear the aprons. Where these guards are arranged between two aprons they extend

from the edge of one to the edge of the other apron, immediately above. By this construction the wool passing through the machine is kept away from the sprocket-chain. 70

In machines as at present constructed it is necessary that the aprons be thoroughly clean between the wools of different colors; otherwise each succeeding color of wool is found to have picked up more or less of the odds and
 75 ends of the wool previously run through the machine, thus rendering it practically valueless, especially in the finer grades. I find that my improved guards completely remove this difficulty. The wool is kept away from
 80 the chains, is carried through the machine, and entirely cleared from the apron at the delivery end.

Having thus explained the nature of my invention and described a way of constructing
 85 and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim, and desire to secure by Letters Patent, is— 90

1. In a fiber-drying machine, in combination, an automatic feeding device, a plurality of perforated endless aprons placed one below the other, offset-drums upon which said
 95 aprons are mounted, the contiguous sides of the several aprons being arranged to travel in unison with each other and hold the material between them, guide-plates arranged in front of and below certain of the said drums to guide the material to a lower apron, air-
 100 ports at one end of said aprons, deflecting-plates between and at the opposite end of said aprons from said air-ports, means for imparting motion to said feeding device and said aprons, and means for forcing a current
 105 of air through said ports lengthwise of and opposite to the direction of travel of and up through said aprons and the material carried by them, substantially as and for the purpose set forth. 110

2. In a fiber-drying machine in combination a plurality of perforated endless aprons, offset-drums upon which said aprons are mounted provided with longitudinal depres-
 115 sions upon their peripheries, said aprons comprising in their construction a covering, driving-chains, rods connected at their ends to said chains and to which said covering is attached, said longitudinal grooves or depres-
 120 sions being arranged to engage said rods in order to let the covering rest upon the periphery of the drum, and means for driving said drums and aprons, substantially as and for the purpose set forth.

3. In a fiber-drying machine in combina-
 125 tion shafts mounted in adjustable bearings, a plurality of offset-drums mounted upon said shafts and provided with grooves in their peripheries, a plurality of endless aprons mounted upon said drums, said aprons com-
 130 prising in their construction suitable carrying-chains connected by rods, and a cover-

ing secured to said rods, said rods being arranged to lie in said longitudinal grooves during their passage around the drum in order to let the covering rest upon the periphery of said drums, substantially as and for the purpose set forth.

In testimony whereof I have signed my

name to this specification, in the presence of two subscribing witnesses, this 22d day of December, A. D. 1894.

CHARLES SCHREBLER.

Witnesses:

N. R. WASHBURNE,
E. BATCHELDER.