F. G. SARGENT.

DRIER.

APPLICATION FILED MAR. 16, 1908.

901,191. Patented Oct. 13, 1908.

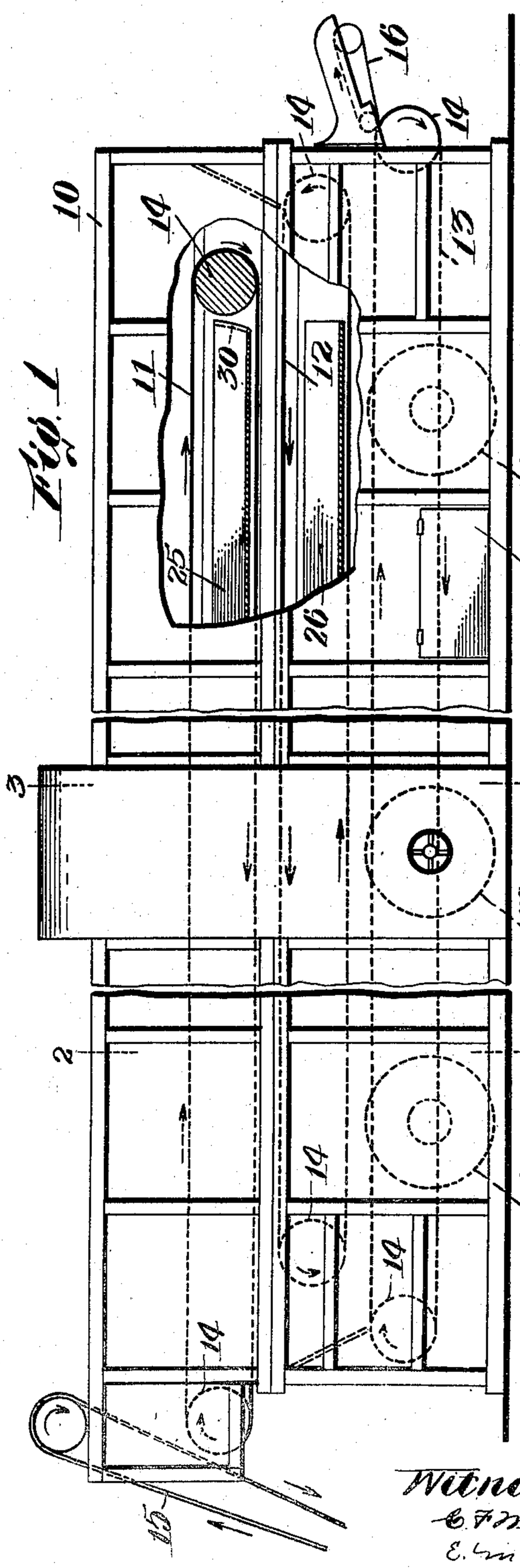

Fig. 1.

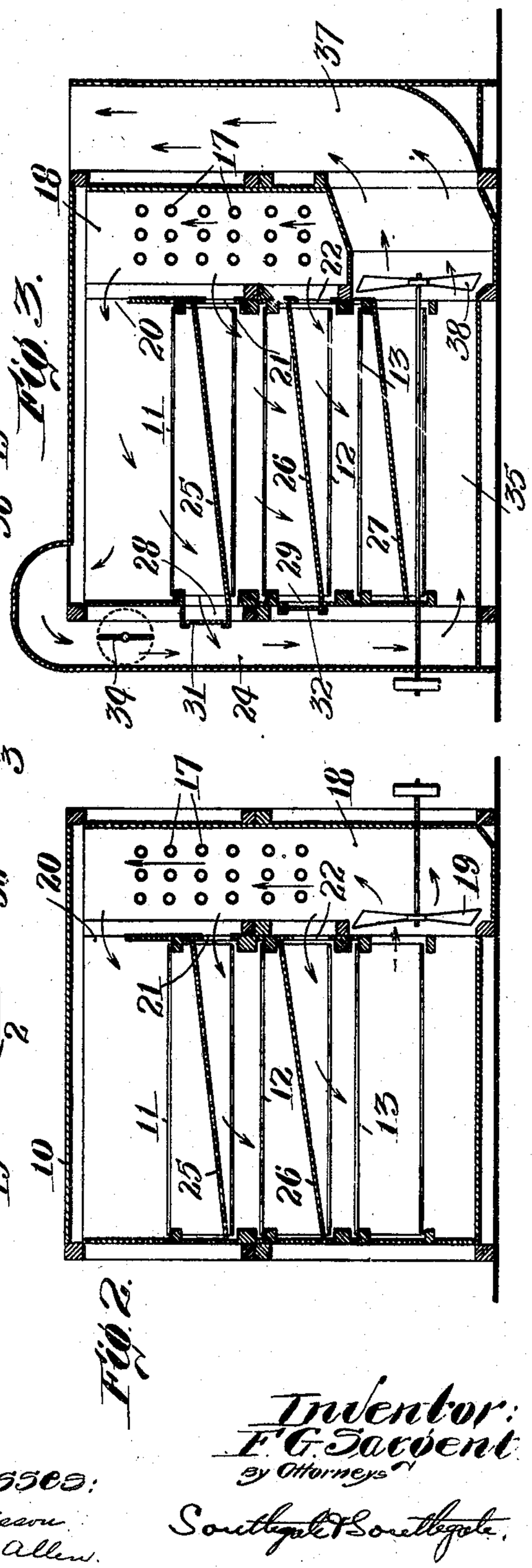

Fig. 3.

Fig. 2.

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UNITED STATES PATENT OFFICE.

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DRIER.

No. 901,191. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed March 16, 1908. Serial No. 421,397.

To all whom it may concern:

Be it known that I, FREDERICK G. SARGENT, a citizen of the United States, residing at Westford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Drier, of which the following is a specification.

This invention relates to a machine for drying wool, cotton, and other substances, and more especially to that type of driers in which a plurality of endless screens or aprons are arranged in the drying chamber so as to convey the drying material from the top one through the others and deliver it at the bottom.

The principal objects of the invention are to provide a simple and inexpensive construction having means by which the air currents are more efficiently controlled than has been the case heretofore, and especially to provide controllable means for directing the air currents along the respective aprons or screens when desired and discharging them directly therethrough when that procedure may be advisable.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings which show a preferred form of the invention, and in which

Figure 1 is a side elevation of the same partly broken away to show the interior construction in section, and Figs. 2 and 3 are transverse sectional views on the lines 2—2 and 3—3 respectively of Fig. 1.

The invention is illustrated as applied to that kind of a drier in which the casing 10 has a plurality of endless conveyers or aprons 11, 12 and 13 therein, each in the form of a screen passing over drums 14, and supporting the wool, cotton or other material to be dried on the upper strand. As is well known the material to be dried is introduced by means of a feed-apron 15 or in any desired way on the top of the upper apron 11, which conveys it along the drier and drops it on the receiving end of the second apron 12. This conveys it back to the other end of the machine, drops it on the apron 13 and the latter takes it through the machine again and delivers it in the opposite direction to the doffer apron 16. In this type of drier the heat is generally obtained from steam coils 17 located in a side chamber 18 and extending along the machine in one or more sections as desired. In this chamber at one side are located a series of air circulating devices 19 preferably in the form of fans driven in any desired way, preferably from the same side of the machine. These fans are preferably operated so as to circulate the air in the direction of the arrows in Fig. 2. After passing around the steam pipes the air is blown through openings 20, 21 and 22 into the drying chamber proper as indicated by the arrows.

As shown in Figs. 1 and 3 there is a conduit or passage 24 at one side of the machine and opening upward, or in any other desired way, from the top thereof, for receiving the air from the drying chamber and directing it out of the machine. This conduit is shown in these drawings as of substantially the same form as that indicated in my United States Patent No. 873,796 of Dec. 17, 1907, and it will not be necessary to describe its operation in detail, except for what will be stated herein, as it operates the same as in the above mentioned patent.

In order to control the direction of the air currents partitions 25 and 26 are located under each of the top strands of the upper aprons. Although I have shown two of the aprons as provided with one of these partitions, the second one may conveniently be omitted, but it is illustrated herein as it adds to the efficiency of the machine. When the device is constructed with the second partition 26, as indicated, both the partitions extend entirely across the drying chamber and incline in the direction shown from the top of the openings immediately below them on the side next to the steam coils to the bottom of openings 28 and 29, on the opposite side. The partition 25 preferably extends about the whole length of the apron 11 and terminates in inclined walls 30 to direct the air currents in the proper direction. The partition 26 when employed, does not extend the full length of the apron 12 so that a space at the end may be left for the free circulation of the air downwardly at its ends. A partition or wall 27 serves chiefly as a cover for the outlet box to be described, and preferably extends only throughout the width thereof.

The air circulates in the following way.

It is blown in through the openings 20 and 21, and also 22 when the partition 26 is used, on the top of the stock on each of the aprons. The air circulates down through the stock on these aprons and divides, part passing into the conduit 24, from which it is discharged from the machine and part circulating along the aprons or, in the case of the apron 11, passing upwardly into the passage from the upper part of the drying chamber. The part which moves along each of the partitions is discharged from the ends thereof into the compartment below so as to be circulated over and over again by the fans 19. When it is found that the air discharged has not properly performed its work and has not taken up enough moisture, the openings 28 and 29 are closed or regulated by means of doors 31 and 32 respectively. These doors are shown as reciprocating in guide-ways. When they are closed all the air discharged into the drying chamber below the partition 25 must circulate longitudinally thereof, and be discharged at the ends where it can be taken up by the fans 19 and circulated again through the machine. If desired, a damper 34 in the passage 24 may be closed, thus necessitating the circulation of the air in the upper part of the chamber in the same way. When the partition 26 is omitted, the circulation of air is of a similar nature, except that the two aprons 12 and 13 are then substantially in the same compartment.

The air is discharged from the apparatus through a box 35 at the bottom, the top of which is formed by the slanting partition 27. This box is of such form as to connect the side passage 24 of the machine with the outlet 37, and a fan 38 is provided for drawing the air from the box and discharging it from the machine through the outlet. This fan is shown as on a shaft passing through the machine, and driven from the opposite side from which the fan 19 is driven. There may be any desired number of fans 19, but only one of the fans 38 is necessary.

It will be seen that by manipulating the closures 31 and 32, and operating the damper 34 the currents of air in the drying chamber can be controlled and directed as may be desired so as to get the greatest efficiency from the air which is circulated through the machine. Ordinarily the condition of these closures and damper will be controlled by the amount of moisture which the air discharged from the machine is found to contain. If it is too dry they are closed so as to make it circulate more times through the material, but if found to be thoroughly saturated with water it may be necessary to open them to avoid circulating damp air through the material too many times.

While I have illustrated and described certain forms of the invention I am aware that many modifications may be made therein by persons skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all details of construction shown, but

What I do claim is:—

1. In a drier having three aprons, the combination with steam coils, of means for circulating air alternately around said steam coils and through the aprons, means for drawing the air from the drier, and means between the strands of the top and second aprons for directing the currents of air across and along the drier between said strands.

2. A drier comprising an apron, steam coils located adjacent thereto, an opening from the steam coils to the top of the apron located above the apron, an inclined partition extending across the space below the apron, a discharge opening above the lower side of said partition, and a passage with which said discharge opening communicates.

3. A drier comprising an endless apron, steam coils located adjacent thereto, an inclined partition extending across the space between the strands of the apron, a discharge opening above the lower side of said partition and below the edge of said apron opposite the steam coils, and an opening below the partition on the other side communicating with the steam coils.

4. In a drier, the combination with an endless apron, of steam coils, means for circulating air through the apron and steam coils, means for drawing the air from the drier, an inclined partition extending entirely across the space between the strands of the apron, an opening above the lower side of said partition, a passage with which said opening communicates, and means for closing said opening.

5. In a drier, the combination of a drying chamber, an apron therein, means for causing air to circulate through said drying chamber to pass through stock on the apron, an outlet opening from the top of said chamber extending downwardly therefrom and entering the chamber below the apron, a partition under the apron extending across the drying chamber, the chamber having an opening from above said partition into said downward extension, and means for controlling said opening, whereby the air may be caused to flow directly into the downward extension or upwardly through said outlet.

6. In a drier, the combination of a drying chamber, an endless apron therein, said chamber having walls at the sides thereof provided with openings for admitting and exhausting air, a partition extending from the top of the openings on one side to the bottom of the corresponding openings on the other, and means for opening and closing the last named openings to control the direc-

tion of the currents of air through the aprons.

7. In a drier, the combination of a drying chamber, a plurality of endless aprons therein, one above the other, said chamber having walls at the sides thereof provided with openings for admitting and exhausting air, and partitions extending from the top of each opening on one side to the bottom of the corresponding opening on the other, the partition under the second apron having spaces at its ends whereby air may circulate around them.

8. In a drier, the combination of a drying chamber, a plurality of endless aprons therein, one above the other, said chamber having walls at the sides thereof provided with openings for admitting and exhausting air, partitions extending from the top of each opening on one side to the bottom of the corresponding opening on the other, the partition under the bottom apron constituting the top of a box for directing the air from the machine, and a fan located adjacent to said box for drawing the air therefrom and discharging it.

9. In a drier, the combination of a drying chamber, an apron therein, said chamber having walls at the sides thereof provided with openings for admitting and exhausting air, a partition under said apron, means for opening and closing the last named openings to control the direction of the currents of air through the apron, a box for directing the air from the machine, a fan located adjacent to said box for drawing the air therefrom and discharging it, and a vertical passage along one side of the drying chamber communicating therewith through said openings and communicating with said box.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

FREDERICK G. SARGENT.

Witnesses:

ALLAN C. SARGENT,

CHAS. G. SARGENT.