

(No Model.)

2 Sheets—Sheet 1.

M. P. MEISSNER.
CLOTH STRETCHING AND DRYING MACHINE.

No. 505,117.

Patented Sept. 19, 1893.

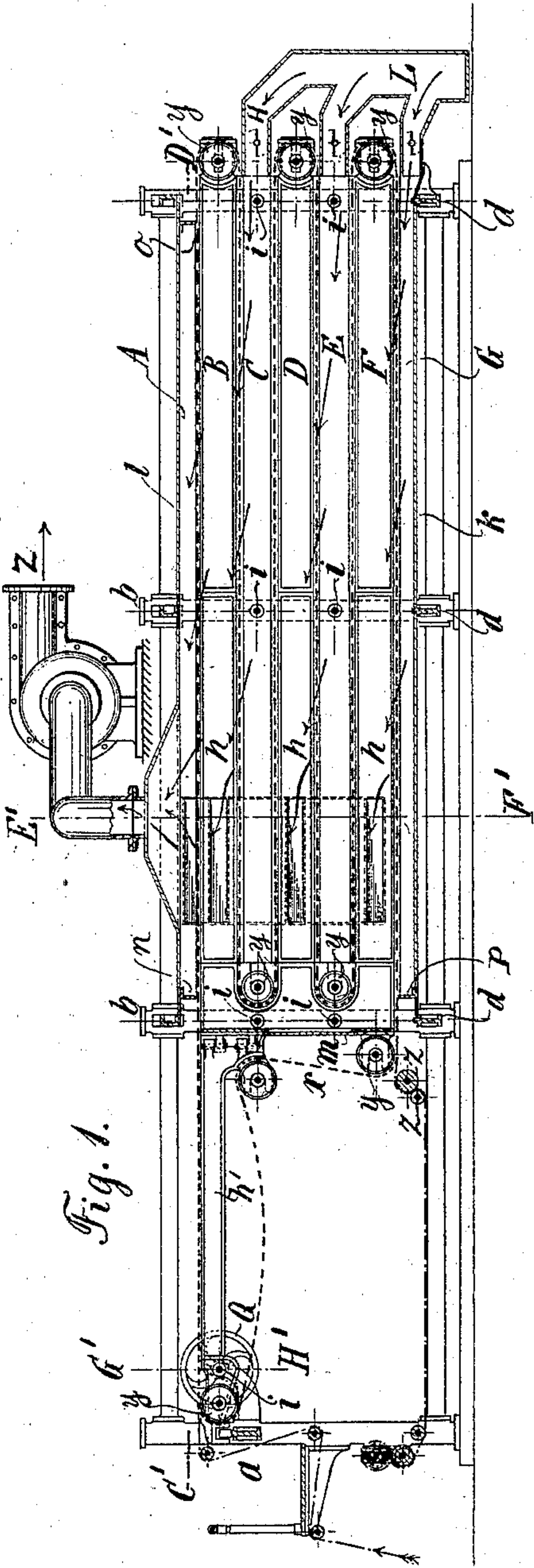


Fig. 1.

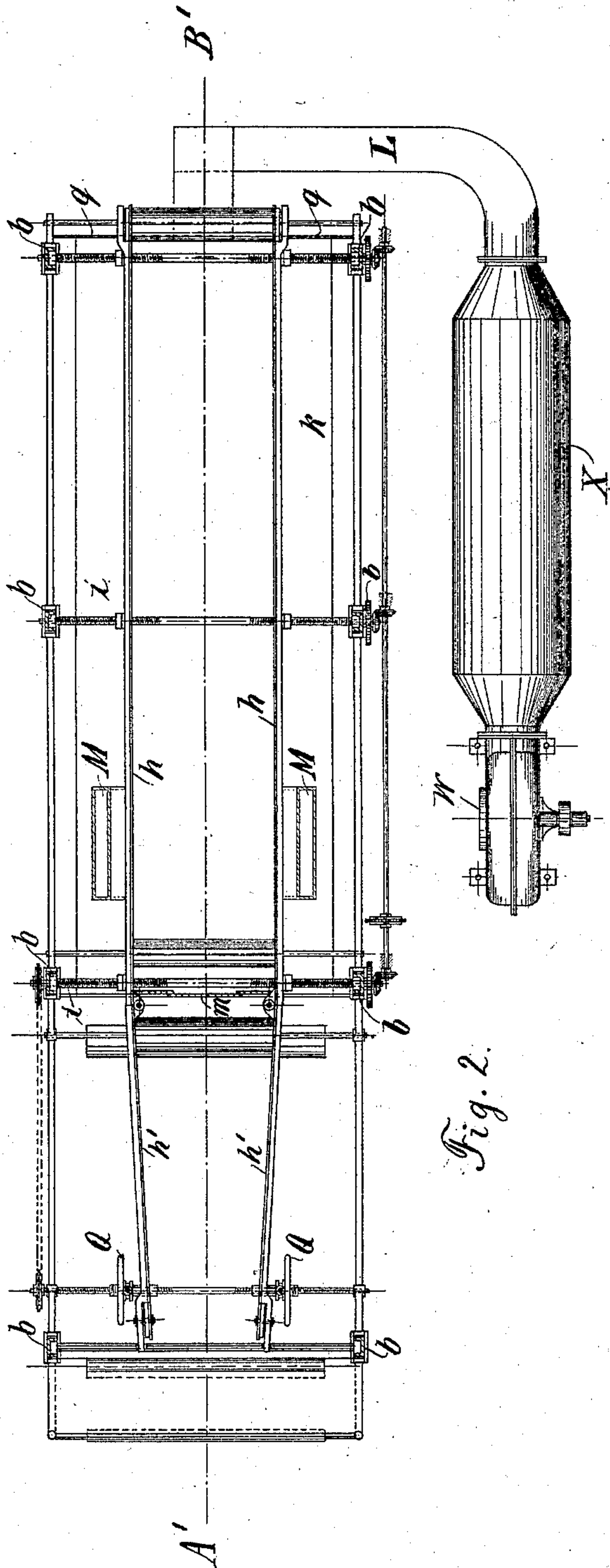


Fig. 2.

WITNESSES:

Fred White
G. K. Fraser

INVENTOR:

Moritz Paul Meissner,
By his Attorneys
Arthur C. Fraser & Co.

(No Model.)

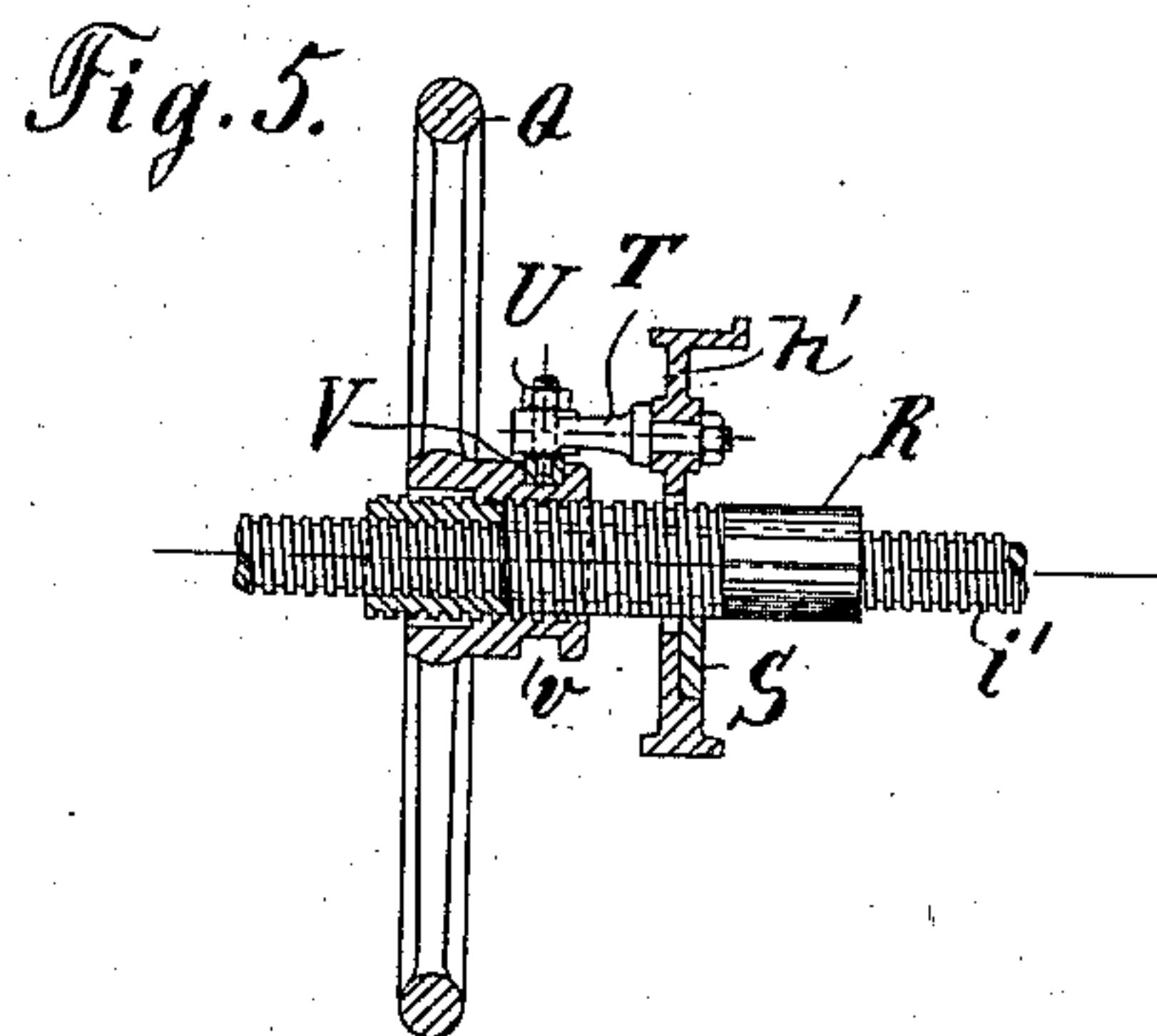
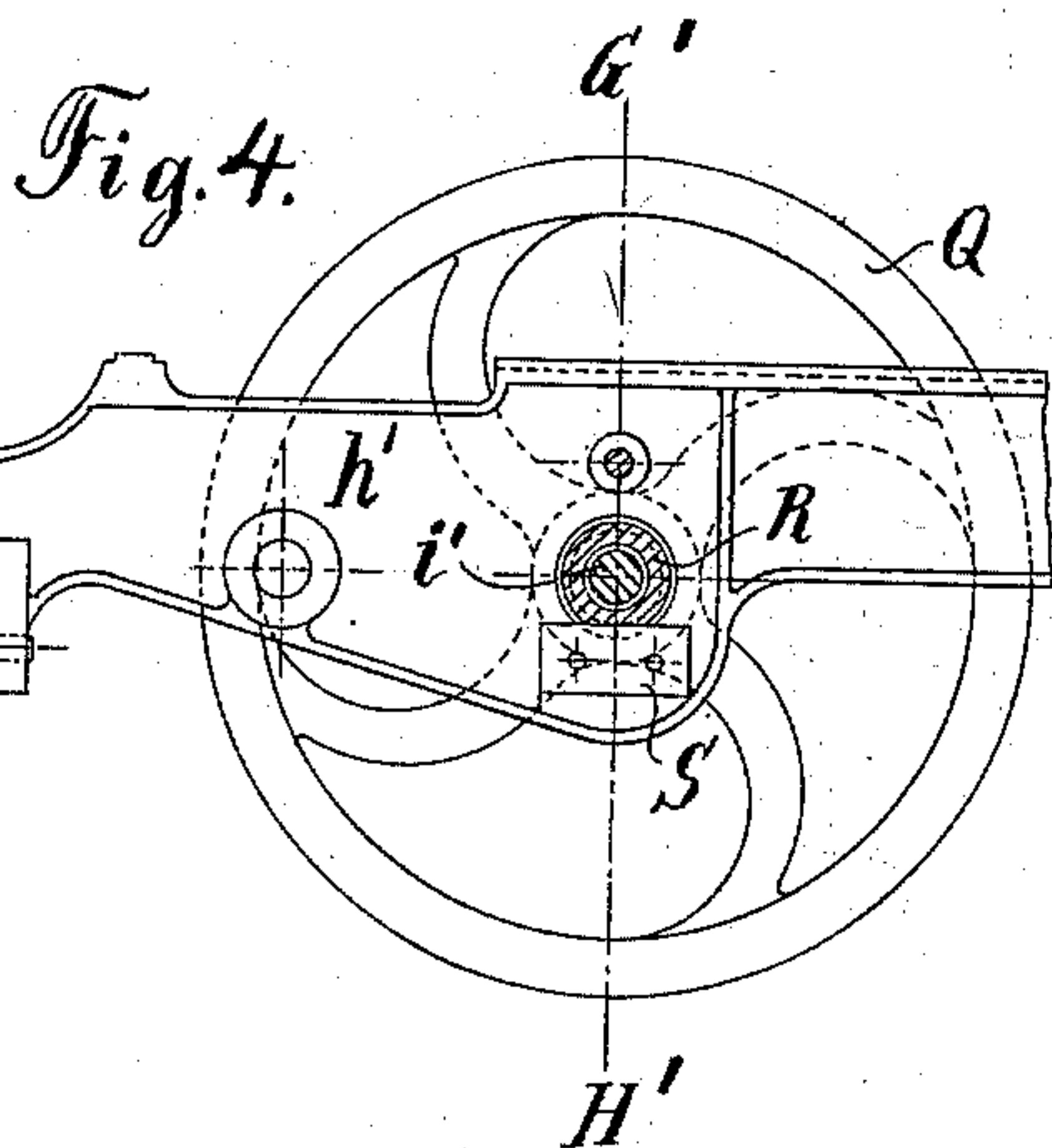
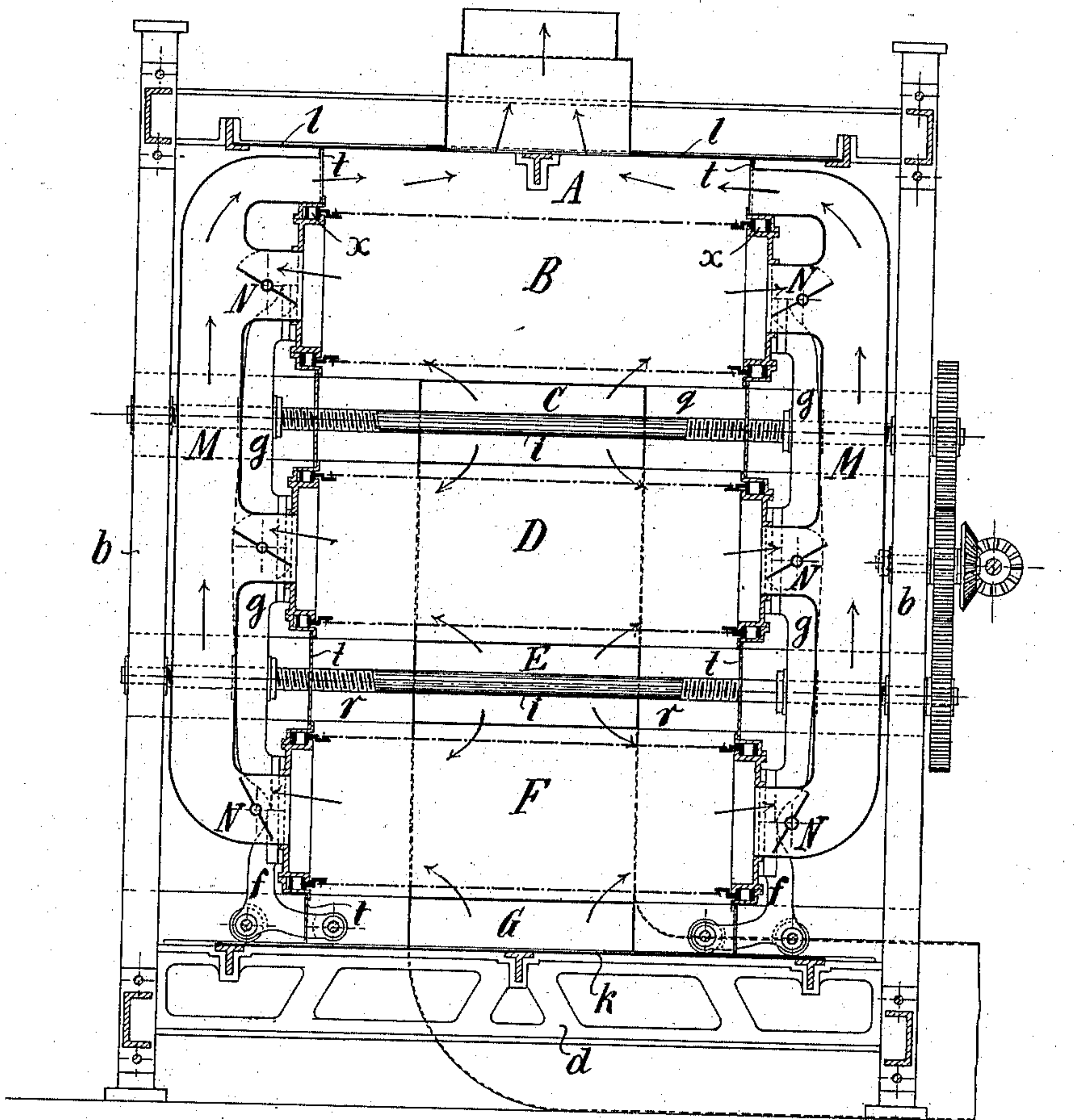
2 Sheets—Sheet 2.

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Fig. 3.



WITNESSES:

Fred White
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UNITED STATES PATENT OFFICE.

MORITZ PAUL MEISSNER, OF CHEMNITZ, GERMANY.

CLOTH STRETCHING AND DRYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 505,117, dated September 19, 1893.

Application filed March 2, 1893. Serial No. 464,340. (No model.)

To all whom it may concern:

Be it known that I, MORITZ PAUL MEISSNER, manufacturer, a subject of the German Emperor, residing in Chemnitz, Saxony, German Empire, have invented certain new and useful Improvements in Cloth Stretching and Drying Machines, of which the following is a specification.

This invention relates to machines for stretching and drying felts and other fabrics, and aims to provide an improved machine of this character.

The so called closed stretching and drying machine as heretofore used for stretching and drying fabrics consists essentially of a casing in which the fabric is moved to and fro in a serpentine manner, and into which heated air is introduced. In such machines, to effect and insure the proper drying of the several lengths of fabric, heating bodies have been arranged in the casing between the lengths of fabric for the purpose of heating the air. This arrangement has presented certain disadvantages, and the object of the present invention is to obviate these disadvantages and render unnecessary the use of the said heating bodies. To this end I utilize according to the present invention a closed casing, inclosing the lengths of fabric to be dried the fabric traversing the casing and subdividing it internally into a number of chambers into the alternate ones of which heated air is introduced while the intermediate chambers serve for conducting the air away, and I provide certain other improvements which will be hereinafter set forth.

In order to remove the air saturated with moisture which has previously been forced into the apparatus, from the interior of the latter, and at the same time to keep up a strong circulation of air in the same, an exhaustor is suitably arranged in connection with the apparatus to draw off the moist air from the several chambers thereof in such manner that hot air will be caused to follow that drawn off, whereby the hot air can be introduced more easily.

My improved machine has a very high efficiency, which has been proved to be due less to the use of high temperature therein than

to the energetic circulation of moderately heated air blown into and passing through the machine. This feature is particularly valuable in the case of drying fabrics which have sensitive colors, and it has moreover a very favorable influence on the quality of the goods.

In the accompanying drawings I have shown how my said invention can be conveniently and advantageously carried into practice.

In the drawings, Figure 1 is a vertical longitudinal section of a machine constructed according to my invention, the section being cut on the line A' B' of Fig. 2. Fig. 2 is a plan view thereof, partly in horizontal section on the line C' D' of Fig. 1. Fig. 3 is a vertical transverse section thereof on a larger scale looking toward the rear and cut on the line E', F' of Fig. 1. Fig. 4 is an enlarged fragmentary elevation showing the details of construction for the inlet walls of the machine, and Fig. 5 is a vertical section thereof on the line G', H'.

Referring to the drawings I will now describe my invention in its preferred form and as applied to the machine therein illustrated, which is shown in Figs. 1 and 2 with its front end at the left and its rear end at the right hand side.

The fabric to be dried is taken up in a well known manner by two endless chains x , provided with needles or clamps for engaging the opposite edges or selvages of the fabric, and conducted through the machine in a serpentine form. The chains x slide on tracks or other suitable provisions on the side walls h of the apparatus (which walls are adapted to be adjusted in the transverse direction of the machine), and on two pivoted stretching cheeks h' , and are guided by the aid of appropriate rollers y properly disposed throughout the machine. The fabric is introduced at the front of the machine (at the left in Figs. 1 and 2), and is first conducted by the chains x which engage its edges over the said cheeks h' , which diverge toward their rear ends in such manner that a tension or stretching of the fabric in transverse direction is produced to the extent of their divergence, (see Fig. 2,) and the fabric therefore passes in a stretched condition into and through the machine, in

serpentine windings and preferably forming six lengths which divide the casing of the apparatus into chambers A, B, C, D, E, F, and G, of which chambers one group B, D and F is laterally bounded by the above mentioned side walls *h*, which are connected with each other on their outer sides by bow pieces *g*, while the intermediate chambers, A, C, E and F are closed laterally by strips *t* of sheet metal. Delivery rollers *z* are provided for taking the fabric from the chains *x* as it leaves the machine, (see Fig. 1,) in a well known manner, from whence it may be conducted to any winding or delivery device. The two long walls of the casing, which are constructed in the manner described, rest upon roller feet *f*, which are adapted to run upon transverse beams *d* uniting transverse columns *b*, and are kept adjusted by transverse spindles *i* having right and left hand screw threads and rotatively supported with their ends in the columns *b* (see Figs. 2 and 3). The lower chamber G is closed below by a bottom piece *k*; the top chamber A by a suitable cover *l*, and the front of all the chambers by a wall *m*. This wall does not quite join either the top cover *l* or the bottom piece *k*, but leaves apertures serving as inlet and outlet for the fabric; the said wall however extends up closely to the fabric in both directions. The lower or outlet aperture is closed underneath the fabric by an angular plate *p* joining the bottom piece *k* and the upper aperture is closed by an angular plate *n* joined to the cover *l* on the upper side of the fabric. Opposite the said plate *n*, at the other end of the cover, is provided an angular plate *o* serving the same purpose as the plate *n*, and forming part of the rear wall. The main part of the rear wall is formed by the fabric itself, which is here conducted over the rollers *y*, and also by the branches H of the air pipe L, which branches terminate between said rollers. At the side of these branches lateral closing plates *q* (see Fig. 2) are provided for completing the rear wall.

The casing according to my invention is a closed casing excluding the outer air, so that the treatment of the fabric is independent of outer atmospheric conditions. The air heating apparatus is removed from the casing, and thereby avoids impairment of the fabric.

In operating the apparatus heated air is conducted from any suitable source of treated air (as compressed, dried, or heated air differing from ordinary outer air) as the rotary forcing fan W and heating vessel X shown in Fig. 2, through the main air pipe L and its branches H, which branches are provided with regulating flap valves, into the lower, third, and fifth chambers G, E and C, between the rollers *y*. The other chambers F, D, B and A, are in communication with each other through lateral connecting channels M, and with an outlet pipe leading to any suitable and sufficiently powerful exhaustor *z*. Ac-

cordingly through the action of the exhaustor and of the fan, a rarefaction of the air takes place in the said chambers F, D, B and A, while an air pressure is produced in the said chambers G, E and C. The result of this is that a rapid change or circulation of air is caused to take place between the said alternate chambers G and F, D and E and C and B which are separated from each other by the lengths or layers of the fabric, and consequently an extraordinarily effective withdrawal of moisture from the fabric results, the moisture being continually carried away by the exhaustor. Therefore every two chambers situated one above the other constitute as it were a drying apparatus by themselves, in which the quantity of air to be blown in or to be drawn out can be regulated at will as by means of the flap valves which are provided in the branch air pipes H, and in the tubular parts N of the connecting pipes M leading to the exhaustor.

By reason of the high efficiency of the machine very rapid working is possible. Therefore provision has to be made for an equally rapid and convenient introduction of the fabric into the machine. For this purpose the introduction or stretching cheeks *h'*, pivoted laterally on hinges at the rear end are furnished with a device which facilitates the work of the attendant in so far that he does not need to guide the fabric in order that it may enter the machine properly. He has only to turn the hand wheels Q to the right or to the left, which will effect the adjustment of the cheeks *h'* in such manner that the needles or clamps provided on the transporting chains *x* will always seize the fabric at its selvages. This arrangement, which is of special importance in the case of highly sized or other sensitive fabrics, and is also applicable for stretching machines of other systems, consists of a long socket or sleeve R (Figs. 4 and 5), both internally and externally screw threaded, which sleeve extends through the cheek and has a flattened side *s*, by means of which it bears against a plate secured to the stretching cheek *h'*, and is thus prevented from rotating. Upon this socket or sleeve turns a hand wheel Q having an internal screw thread engaging the external thread of said sleeve and having a groove *v* formed on its nave or hub.

On the cheek *h'* is fixed a bracket or stud T, provided at one end with a journal U on which a roller V is fitted to turn freely. This journal U engages by means of the roller V with the groove in the nave of the hand wheel, so that by turning the latter upon the screw thread of the socket or sleeve to the right or to the left, the corresponding stretching cheek *h'* will be displaced to one side or to the other through the medium of the roller V, the journal U and stud T mounted on the stretching cheek. The sleeve R itself is fitted upon a spindle *v'*, having an external screw thread engag-

ing the internal thread of the sleeve, which spindle extends transversely through the frame of the machine. This spindle is connected by chain pulleys and a chain with the other adjusting spindles which effect the arrangement of the long walls *h*, so that when by the aid of the last mentioned spindles *i* these walls are adjusted toward or from each other, the pivoted stretching cheeks *h'* are correspondingly adjusted at the same time.

In the stretching and drying machines heretofore employed the introducing or stretching cheeks have been placed obliquely to each other at a definite angle, so that an optional displacement of the cheeks during operation was impossible. Other machines have been made which were not furnished with adjusting spindles of any kind. The introducing or stretching cheeks in such machines have been displaced by hand levers arranged on the wall. With other machines provided with adjusting spindles there has been no connection between the latter and the other adjusting spindles. In the two machines last mentioned the further adjustment of the introducing cheeks has however been possible, but the simultaneous adjustment of the same has been extremely difficult when the long walls are adjusted, since it has necessitated a special expenditure of labor and could seldom be carried out without causing damage. The connection of the adjusting spindles with one another as provided in my improved machine is of great value.

It will be seen that my invention provides improvements in stretching and drying machines which can be variously availed of in such form as experience or the judgment of those skilled in the art may dictate without departing from the essential features of the invention, and it will be understood that the invention is not limited to the precise details of construction and adaptation herein set forth as its preferred form.

What I claim is, in stretching or drying machines, the following-defined novel features and combinations, substantially as hereinbefore set forth, namely:

1. In a stretching and drying machine, a closed casing, the interior of which is closed from the outer air, and tracks traversing said casing for carrying the fabric to be dried, whereby the casing is divided by the lengths of the fabric into several chambers, in combination with an air admission pipe for supplying treated air to said casing opening into the interior of said casing at one side of said tracks, and thereby communicating with one of said chambers, and a discharge pipe opening into the interior of said casing at the other side of said tracks and thereby communicating with the other of said chambers, whereby a length of fabric traversing said casing on said tracks will intervene between said admission and discharge pipes, and air entering said casing through said admission

pipe will be drawn through the fabric and discharged through said discharge pipe, and the fabric while drying will be isolated from the outer air and air differing from ordinary atmospheric air may be fed to the apparatus.

2. In a stretching and drying machine, a closed casing, the interior of which is closed from the outer air, and tracks traversing said casing for carrying the fabric to be dried, whereby the casing is divided by the lengths of the fabric into several chambers, in combination with an air admission pipe for supplying treated air to said casing opening into the interior of said casing at one side of said tracks, and thereby communicating with one of said chambers, and a discharge pipe opening into the interior of said casing at the other side of said tracks and thereby communicating with the other of said chambers, whereby a length of fabric traversing said casing on said tracks will intervene between said admission and discharge pipes, and treated air entering said casing through said admission pipe will be drawn through the fabric and discharged through said discharge pipe and in its passage to, through and from the apparatus will be isolated from the outer air, and a fan communicating with said admission pipe for forcing air therein, and an exhaust communicating with said discharge pipe for exhausting air therefrom, whereby the fabric can be treated independently of the outer air and with air differing in its condition from the latter, substantially as and for the purpose set forth.

3. In a stretching and drying machine the combination with a closed casing constructed with inlets and outlets for the fabric to be dried, of a chain α for carrying the fabric to be dried through said casing, traversing the latter and dividing said casing into chambers, whereby when the fabric is carried within said casing by said chain, said casing is subdivided into chambers at opposite sides of such fabric, an air inlet pipe for delivering heated air to said casing at one side of said chain, an air heater in connection with said inlet pipe and delivering heated air thereto, an air exhaust pipe for withdrawing air therefrom at the other side of said chain, and an exhaust connected to said air exhaust pipe, whereby the outer air is excluded and the air used is heated before reaching the casing, and in the circulation of air through said casing from said inlet to said exhaust it is caused to pass through the fabric carried by said chain, and thereby the drying of such fabric is expedited.

4. In a stretching and drying machine, a closed casing comprising the side walls *h*, intermediate strip *t*, bottom *k*, cover *l* and front wall *m*, in combination with chains α for carrying the fabric, rollers γ over which said chain travel, air inlet pipe *L* delivering heated air between said chains, and an air exhaust pipe in said cover and at the side of said chains opposite to said inlet pipe, whereby

when lengths of fabric are carried on said chains heated air from said inlet will be introduced at one side of such fabric and upon passing through the latter will be withdrawn
5 through said exhaust, and the outer air will be excluded, substantially as and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MORITZ PAUL MEISSNER.

Witnesses:

R. E. JAHN,

L. BARNES.