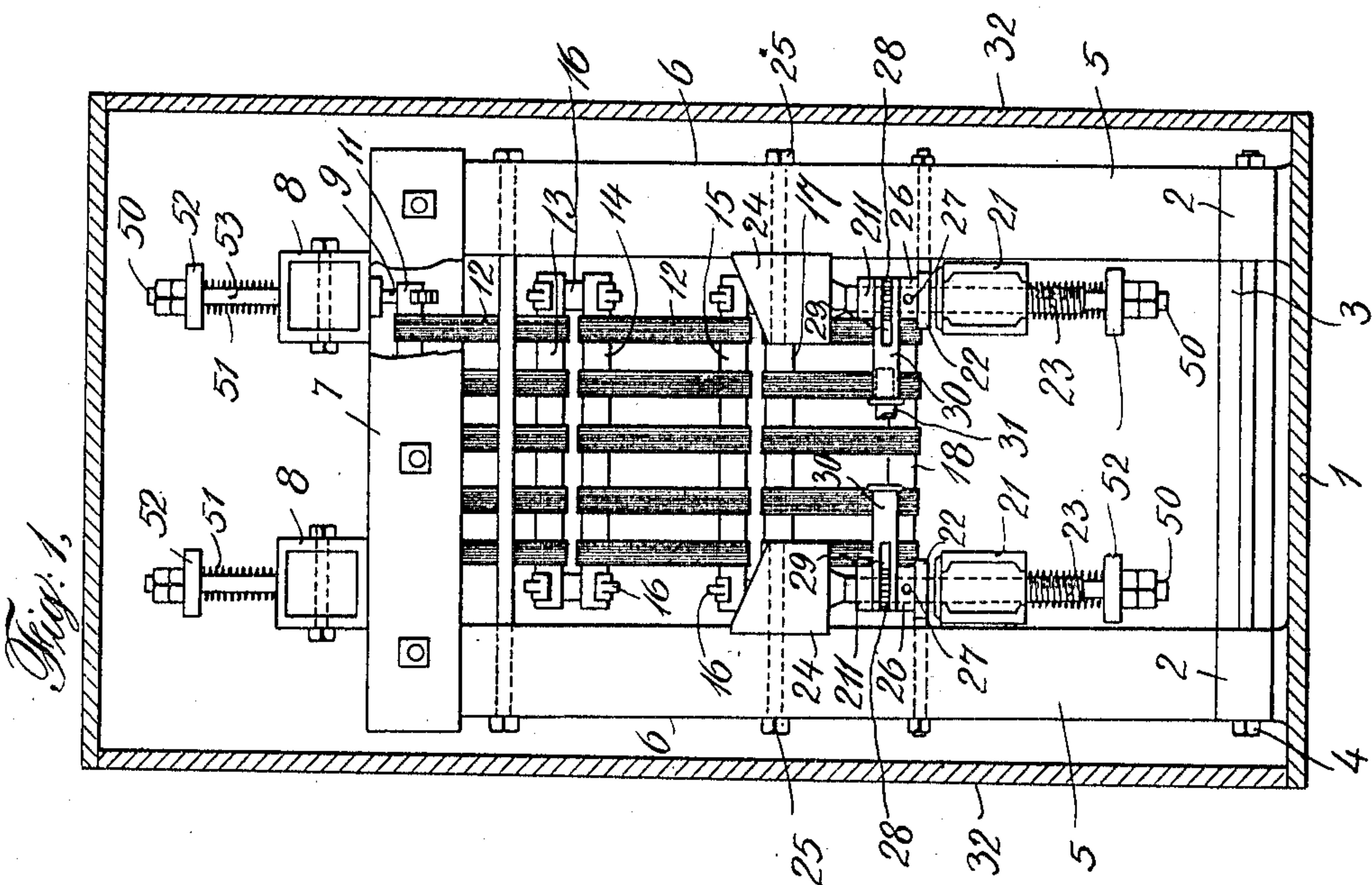
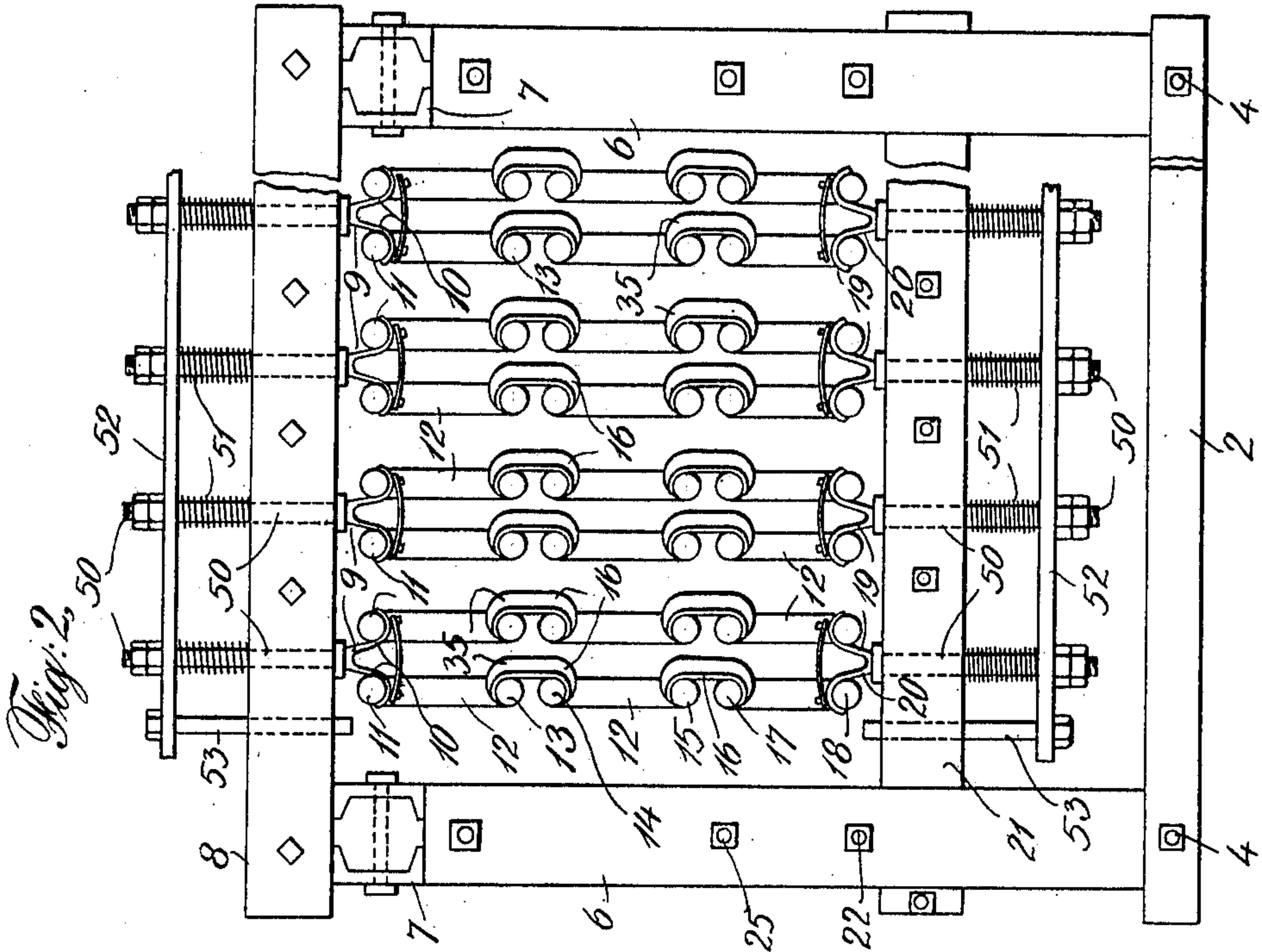


J. KNOTT.
 APPARATUS FOR STRETCHING AND DRYING SKEINS OF SILK AND LIKE MATERIALS.
 APPLICATION FILED JAN. 21, 1910.

969,960.

Patented Sept. 13, 1910.



Witnesses:
 Max P. A. Doring
 Paul H. Frank

Jacob Knott Inventor
 By his Attorneys
 Dickerson, Brown, Kargener & Matty

UNITED STATES PATENT OFFICE.

JACOB KNOTT, OF PATERSON, NEW JERSEY.

APPARATUS FOR STRETCHING AND DRYING SKEINS OF SILK AND LIKE MATERIALS.

969,960.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed January 21, 1910. Serial No. 539,304.

To all whom it may concern:

Be it known that I, JACOB KNOTT, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Apparatus for Stretching and Drying Skeins of Silk and Like Materials, of which the following is a specification.

My invention relates to apparatus for stretching and drying skeins of silk and like materials and comprises a series of racks or stretching frames so constructed as to keep the skeins under uniform tension to expose the same for the efficient circulation of steam and air.

The invention further relates to means for preventing the application of excessive tension on the skeins due to sudden changes in temperature of the circulating steam or air, or unequal lengths of the skeins.

The objects of my invention are to improve upon the construction of drying apparatus similar to that shown in my U. S. Letters Patent No. 864,310 patented August 27, 1907, by providing spring acting means for preventing the application of excessive tension on the skeins due to sudden changes in temperature of the circulating steam or air.

I will now proceed to describe my invention with reference to the accompanying drawings, in which one form of apparatus embodying my invention is illustrated, and will then point out the novel features in the claim.

In the drawings: Figure 1 shows an end elevation of the apparatus, a portion of the frame work having been broken away. Fig. 2 shows a side elevation of the apparatus.

Referring to the drawings, 1 represents a foundation frame which consists of the longitudinal members 2 and the transverse members 3 which are suitably joined at their ends and held securely in position by means of the through bolts 4. At each end of the foundation frame 1 are secured the upright frames 5 each of which consists of the upright members 6 and the transverse members 7 which are supported upon the upper ends of the members 6 and suitably secured thereto in any desired manner. Supported upon the transverse member 7 are cross-members 8 which are each provided

with a plurality of hangers 9. The hangers 9 are preferably made of metal and provided with bent portions 10 which are adapted to hold the ends of the rods 11. From the rods 11 are hung skeins 12 of silk or other material to be dried; and from these skeins are hung other skeins 12 by means of rods 13 passed through the first row of skeins, rods 14 passed through the second row of skeins and open yokes 16 by which said rods 14 are suspended from said rods 13. In like manner I may suspend a third row of skeins from the second row by means of other rods 15 and 17 and yoke 16; and so on. The bottom row of skeins have threaded through and supported by them rods 18 over which fit hooked portions 19 of stretching bolts 20 substantially similar in construction to the hangers 9 previously mentioned. These stretching bolts 20 pass through and are secured to stretching frames 21, and for applying tension to the skeins in addition to that due to the weight of the parts previously mentioned, I provide screw jacks 211 held in position and guided by eyebolts 22 passed through the uprights 6 and the screws 23 of which pass through the stretching frames 21, the latter therefore forming butts for said screws. The upper or butt ends of these jacks bear against abutments 24 secured to the uprights 6 by means of the bolts 25.

For operating the jacks to force the stretching frames 21 downward and apply tension to the skeins, I provide collars 26 fast on said screws and provided with sockets 27 in which turning bars may be inserted and I further provide ratchet arms 30 carrying pawls 29 engaging ratchet wheels 28 on the screws; said ratchet arms having in their ends sockets adapted to receive turning bars 31, one of which broken away, is shown in Fig. 1. I may turn the screw either by the collars 26 or by the ratchet arms 30 or by both, the two turning devices permitting several more to work simultaneously in operating the jacks. The collars 26 further serve, by resting upon the eyebolts 22, to support the jacks in proper position when there is no tension on the skeins.

The yokes 16 are preferably open at one

side and provided with a rib 35 to give the necessary amount of strength to the same as they have to resist a great deal of strain when the silk is being stretched. The object
 5 in making the yokes 16 open at one side is to facilitate the insertion of the rods carrying the skeins of silk without getting the same snarled or tangled, which was often the case when continuous yokes or rings were pro-
 10 vided for suspending the rods upon which the skeins of silk were carefully arranged. By providing the yokes 16 so that the same are open at one side, it will be seen that after the silk has been dried and the tension of the
 15 screws has been released, one person can easily remove the skeins of silk, by taking hold of each end of the rod 17 and simply raising the same to remove the bar from the yokes 16 without disengaging the skeins
 20 of silk. In this manner all the different skeins of silk supported upon the different rods can be removed one after the other without in any way interfering with the arrangement of the silk. It is also to be noted
 25 that the silk can be set up just as easily as the same can be taken down which is a great advantage of this construction.

It is highly important that the horizontal members 7, 8 and 21 shall remain perfectly
 30 straight and shall not warp or bend materially or take a permanent set under the influence of heat and moisture and changes of temperature. Neither metal beams nor wooden beams are by themselves satisfactory
 35 in this respect, the wooden beams being extremely likely to warp or take a permanent set and the iron beams lacking stiffness unless of excessive dimensions; but I have found that the conditions are satisfactorily
 40 met by armored or incased wooden beams as shown, the wooden beams forming the center portion of these members being incased in channel iron side members bolted together by
 45 giving great strength and serving in great measure to protect the wooden center pieces from the effected moisture, while said wooden pieces in turn give the entire structure a stiffness and strength which it would
 50 otherwise lack. It is exceedingly important that these members 7, 8 and 21 shall remain straight, as otherwise there can be no certainty that tension is applied uniformly to all of the skeins.

55 The means for varying the tension of the adjustable members 21 is preferably placed upon the inside of the upright members 6 so that the frame will take up less room than has heretofore been the case when the tight-
 60 ening device has been placed upon the outside of the members 6. This permits the apparatus to be inclosed in a casing 32 shown in section in Fig. 1, whereby hot dry air may

be passed through the apparatus to aid in drying the silk or other material. 65

In my Patent No. 864,310 the hangers 9 and corresponding hook portions 19 were bolted to their respective transverse members so as not to allow of any freedom of movement, and it often happened that the skeins in
 70 the frame would break when the hot air or steam was turned off and cold air admitted due to the contracting of the skeins. In the present instance this breaking of the skeins has been overcome by extending the shank
 75 portions 50 of the hangers 9 and the hook portions 19, so as to permit of the coiled springs 51 being placed as shown in the drawings, one end of the springs bearing
 80 against the transverse members 8 and 21 whereas the other end of the springs bear against the equalizing bars 52 which are held in position by means of suitable nuts placed
 85 on the ends of the shanks 50. In the present instance the equalizing bars 52 are provided at each end with a bolt 53 secured at one end to the equalizing bar, the other end of each
 90 of the bolts 53 fitting in suitable holes in the transverse members for holding the equalizing bar in alinement. In order to prevent the hangers 9 and hook portions 19 from
 95 turning, the shanks 50 are preferably made square, the holes in the transverse members and equalizing bars through which the shanks pass being also made square to accom-
 100 plish this purpose.

It will now be seen that when all of the skeins have been placed in position in the frame and the screw jacks 211 have been
 100 tightened to stretch the same any inequality in the length of the skeins although very small will be compensated for by means of the springs 51. While the skeins are under
 105 tension it is customary to pass steam through the frame after which the steam is turned off and the skeins allowed to cool during which time the skeins tend to shrink and very often break, this difficulty being over-
 110 come in the present instance by supporting the hangers upon springs as above described. It is also to be noted that the tension upon the different sets of skeins is equalized through the medium of the equal-
 115 izing bars 52 so as to give a uniform tension upon each of the skeins which is another im-
 120 portant feature of my invention.

While the invention has been described with particular reference to the details of construction it is not to be considered as limited thereto as many changes may be
 125 made and still fall within the scope of the appended claim.

What I claim is:—

Drying apparatus comprising in combination a supporting framework provided with
 125 hangers for carrying skein bars, and with

stretching beams provided with stretching
bolts likewise adapted to receive skein bars,
tension applying means for moving said
stretching beams, coiled springs secured to
5 said hangers, and an equalizing bar for con-
necting said coiled springs as and for the
purposes set forth.

In testimony whereof I have signed this
specification in the presence of two sub-
scribing witnesses.

JACOB KNOTT.

Witnesses:

LEO J. MATTY,
D. A. DAVIES.