

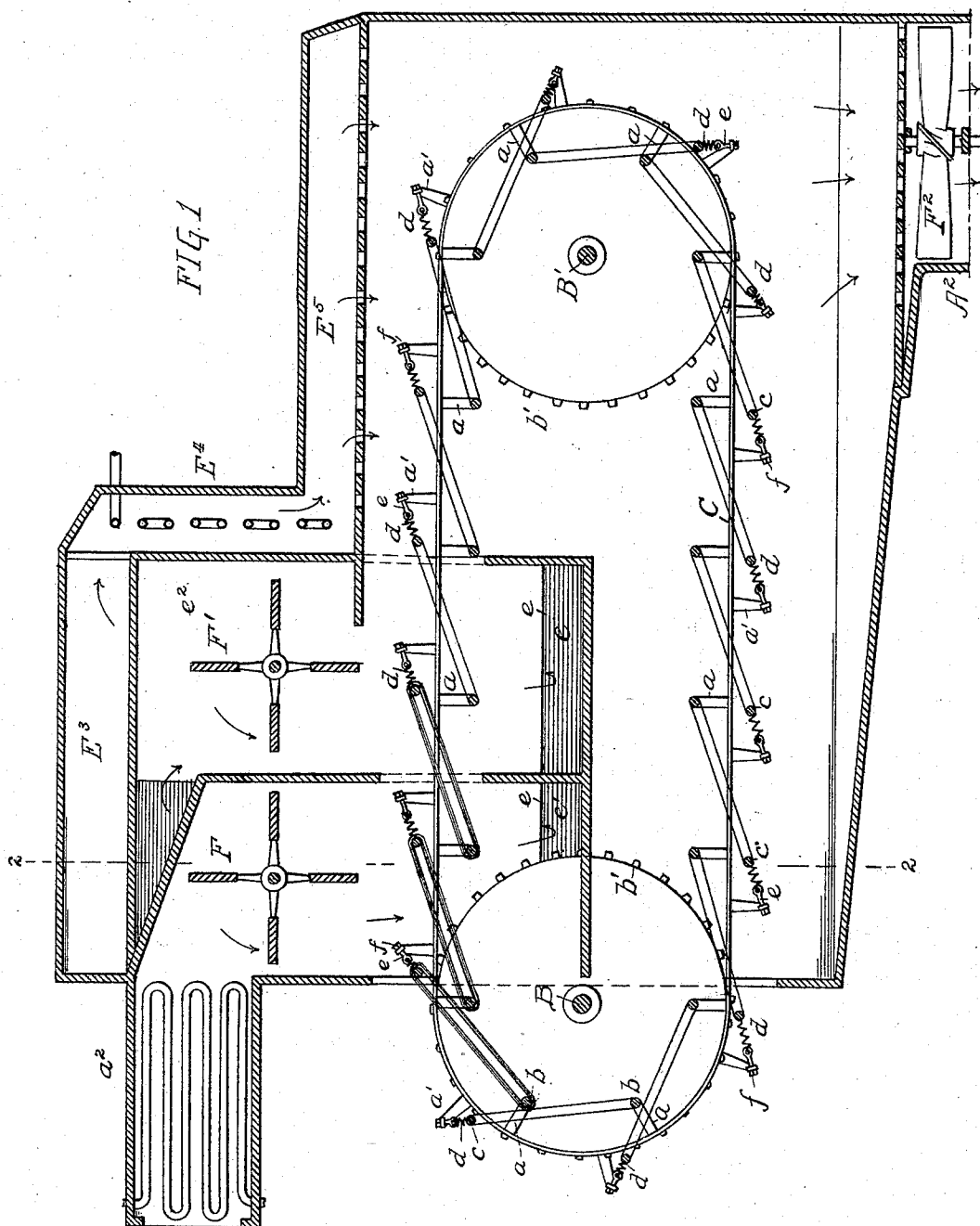
(No Model.)

2 Sheets—Sheet 1.

O. DUCKWORTH.
APPARATUS FOR DRYING YARN.

No. 541,922.

Patented July 2, 1895.



Witnesses:
Geo. C. Parker
J. Henderson

Inventor
Ormond Duckworth
by his Attorney.
James Petrie

(No Model.)

2 Sheets—Sheet 2.

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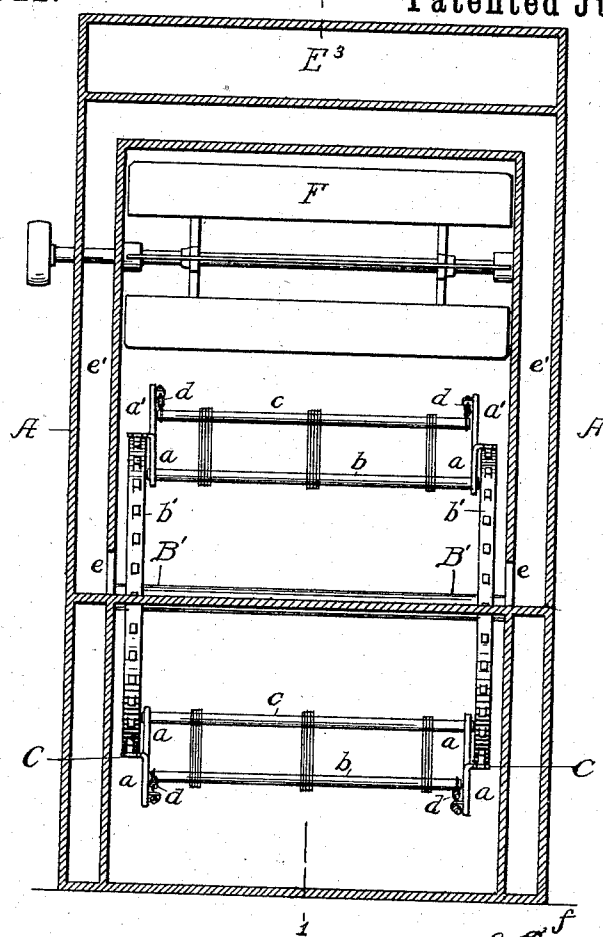


FIG. 2

FIG. 3

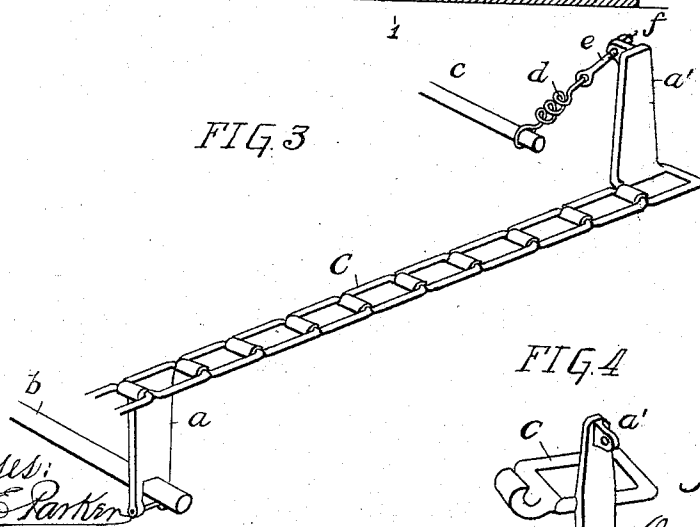
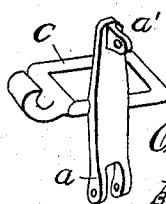


FIG. 4



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UNITED STATES PATENT OFFICE.

ORMEROD DUCKWORTH, OF NORRISTOWN, PENNSYLVANIA.

APPARATUS FOR DRYING YARN.

SPECIFICATION forming part of Letters Patent No. 541,922, dated July 2, 1895.

Application filed September 27, 1893. Serial No. 486,584. (No model.)

To all whom it may concern:

Be it known that I, ORMEROD DUCKWORTH, a subject of the Queen of Great Britain and Ireland, and a resident of the borough of Norristown, county of Montgomery, State of Pennsylvania, have invented a certain Improved Apparatus for Drying Yarn, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an improved apparatus for drying hanks of yarn or thread and it consists essentially of mechanism for keeping the hank or hanks under constant tension during the drying operation in such manner that the gradual lengthening of the hank, due to the decrease in the amount of moisture it contains, will be taken up during its travel through the machine.

Usually in drying hanks of yarn or thread of any description, the tension exerted on the hank is due, for the most part, to the weight of a reel or roller placed at the lower end of the hank but it has been found impracticable to employ a reel or roller of sufficient weight to keep the yarn perfectly straight and prevent snarls and kinking which in some classes of yarn is very apt to occur and if not prevented greatly depreciates its value.

In carrying out my invention I propose to employ two reels or rollers on one of which the hanks are hung and the other having been passed through the hanks is connected at its opposite ends to tension springs carried by the mechanism for traversing the hanks through the machine, the springs being of sufficient length as to take up any increase in the length of hank without materially decreasing the tensional strain they exert upon the yarn.

In the accompanying drawings:—Figure 1 is a longitudinal sectional elevation on the line 1—1, Fig. 2, of an apparatus by which my improved method may be carried into effect. Fig. 2 is a transverse section of the same on the line 2—2, Fig. 1. Fig. 3 is a perspective view on a somewhat larger scale illustrating the manner in which the yarn carrying reels or rollers are secured upon the carrying chain and Fig. 4 is a perspective view of a modified

form of chain link which may be employed in lieu of that shown in Fig. 3.

The various reels or rollers are supported at suitable intervals upon a single set of carrying chains, one at each side of the machine, and the reels or rollers extending transversely across the machine and being attached at their opposite ends to the chains. These chains are traversed within a drying machine of any suitable construction, the machine shown in the drawings being similar to that described in an application for Letters Patent of the United States filed by me on May 13, 1892, under Serial No. 432,839. In this machine a current of air is drawn by a fan, F, through a chamber, a^2 , containing air heating coils and is forced down through the yarn passing through side openings, e , into flues, e' , and from thence escaping into a chamber, e^2 , from which it is forced by a fan, F', down through the yarn and escaping by side flues into passage, E^3 , and from thence into a chamber E^5 , first passing however through a chamber, E^4 , provided with heating pipes and finally escaping through an opening, A^2 , provided with an eduction fan, F². This series of chambers, fans and flues is contained within a main casing, A, open at the front end so that the hanks of yarn may be readily placed upon or removed from the traversing chains.

In suitable bearings on the casing, A, are mounted transverse shafts, B, B', on which are mounted sprocket wheels, b' , forming guides and actuating devices for link belts C, located one at each side of the machine. At intervals the links of this belt are provided with projecting lugs, a , a' , extending in opposite directions from different links or as shown in Fig. 4 a single link may be provided with both lugs, a , a' . The lug, a , is adapted to receive the end of a reel or roller, b , on which the hank of yarn or thread is hung, the opposite end of the hank being also provided with a similar reel or roll, c , which is connected to the lugs, a' , by springs, d , which at all times tend to keep the hanks stretched taut and prevent the formation of kinks or snarls during the drying of the yarn. The manner of connecting the reel or roller, c , to the lug, a' , is shown more clearly in Fig. 3, the lug, a' being provided with an eye bolt, e , to which the

tension spring is secured and the opposite end of the spring being provided with a loop for the insertion of the end of the reel, *c*, while the tension of the spring may be adjusted by means of a nut, *f*, upon the threaded end of the eye bolt. By arranging the hanks of yarn in this manner I am enabled to effectively dry the yarn with the use of a single set of carrying chains and the hank is kept at a practically uniform tension the springs being of a sufficient length to permit their taking up the increase in the length of the yarn as the drying progresses without materially affecting their operation.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a yarn drying apparatus having a casing and passages for directing currents of air through the yarn, traversing chains and bearings, rollers provided upon lugs projecting from opposite sides of the traversing chains, and tension regulating mechanism adapted to maintain the hanks of yarn provided on the rollers in a taut condition, substantially as described.

2. In a yarn drying apparatus, the combination of the traversing chains, roller supports carried thereby, yarn carrying rollers adapted to said supports, and spring tension regulating mechanism acting to maintain the respective rollers of each pair at a given distance apart when the hanks of yarn are stretched upon the same and to maintain the yarn provided on the rollers in a taut condition as the distance between the outer ends of the supports of the rollers increases or decreases in the travel of the chains through the apparatus, substantially as described.

3. The combination in a yarn drying machine of two yarn reels or rolls for carrying hanks or skeins of yarn, chains for traveling said reels or rollers and springs connecting one of such reels or rollers to the chains.

4. In a yarn drying apparatus traverse chains, *C*, lugs, *a'*, rollers, *c*, and tension springs, *d*, securing the rollers to the outer end of the lugs, *a'*, substantially as described.

5. An apparatus for drying yarn comprising a single set of yarn traversing chains, reels or rollers secured to lugs projecting from opposite sides of the chain and adapted to carry the hanks of yarn to be dried and a casing having flues and passages for directing a current or currents of air through the hanks of yarn, substantially as specified.

6. The combination of the casing having flues or passages for directing or inducing air currents, transverse shafts mounted therein, sprocket wheels carried by such shafts, a single set of carrying chains adapted to said sprocket wheels, lugs provided upon said carrying chains and projecting from opposite sides thereof and sets of yarn carrying reels or rollers, the opposite reel of each set being attached to the lugs in such manner that the hank of yarn to be dried will extend across the line of travel of the chains and at an angle thereto, substantially as specified.

7. The combination of the casing having flues or passages for directing or inducing air currents, traversing chains, means for moving the same through said casing, a lug as *a*, projecting from one side of said chains, a yarn carrying reel adapted to such lug, lugs, as *a'*, projecting from the opposite sides of such chains, a second reel or roller and tension springs extending therefrom to the lugs, *a'*, substantially as specified.

8. The combination of a casing having flues or passages for directing or inducing the air currents, yarn carrying chains and means for moving the same through the casing, lugs, as *a*, projecting from one side of the chains and adapted to carry a reel or roller, lugs, *a'* projecting from the opposite sides of the chains, a second reel or roller, adjustable bolts carried by the lugs, *a'*, and tension springs extending from said bolts to such second reel or roller, substantially as specified.

In witness whereof I have hereunto set my hand this 21st day of September, A. D. 1893.

ORMEROD DUCKWORTH.

Witnesses:

ALEX. D. LAUER,
JNO. E. PARKER.