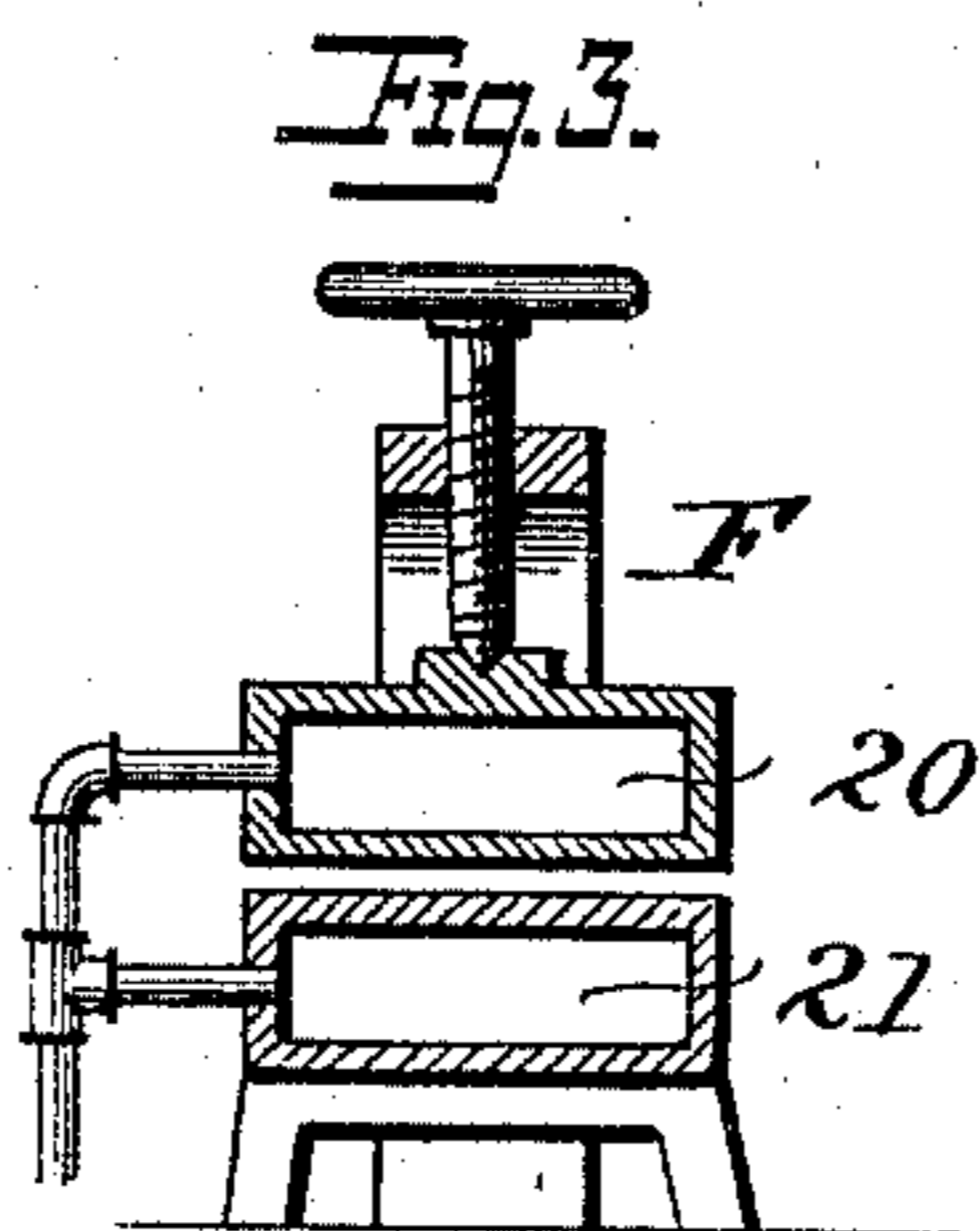
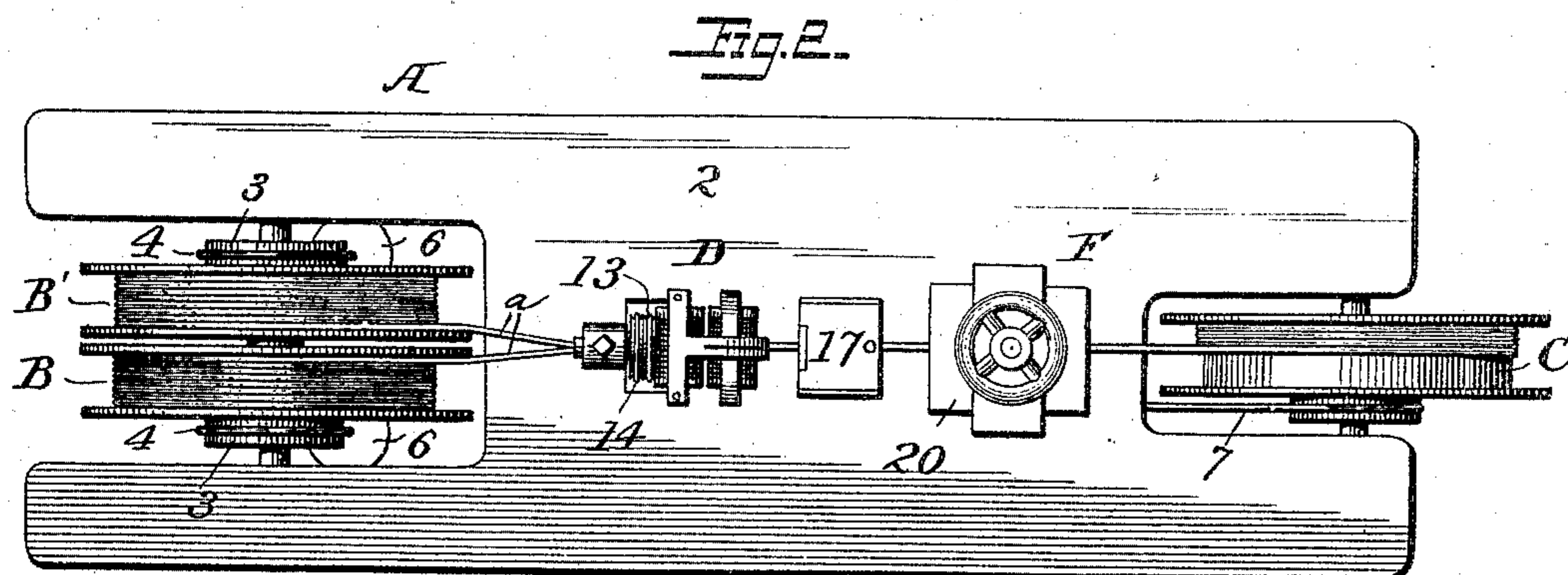
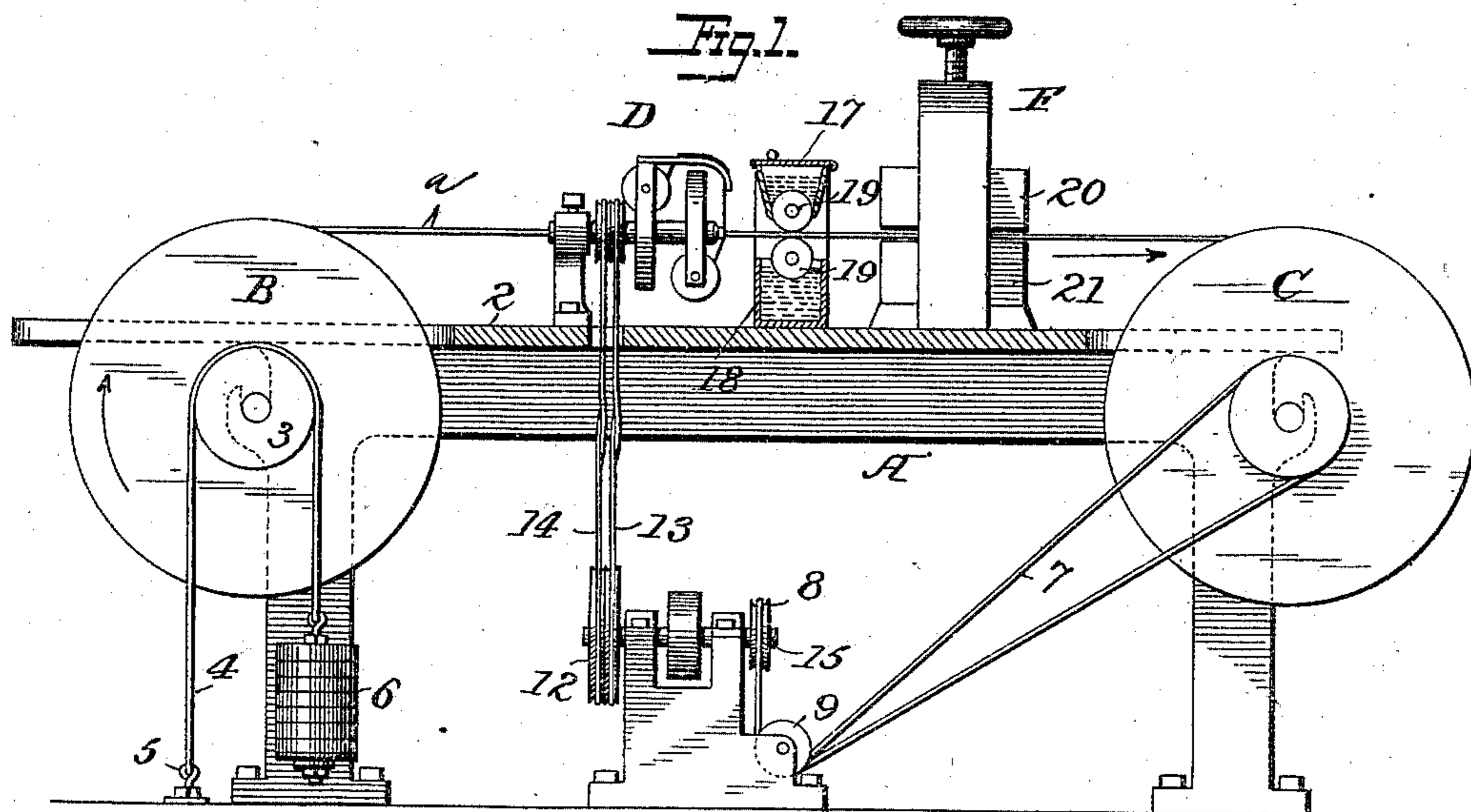


(No Model.)

I. DE VER WARNER.
MACHINE FOR MAKING DRESS STIFFENERS.

No. 500,636.

Patented July 4, 1893.



Witnesses
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UNITED STATES PATENT OFFICE.

IRA DE VER WARNER, OF BRIDGEPORT, CONNECTICUT.

MACHINE FOR MAKING DRESS-STIFFENERS.

SPECIFICATION forming part of Letters Patent No. 500,636, dated July 4, 1893.

Application filed September 28, 1888. Serial No. 286,683. (No model.)

To all whom it may concern:

Be it known that I, IRA DE VER WARNER, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Improvement in Machines for Making Dress-Stiffeners, of which the following is a full, clear, and exact specification.

Frequent attempts have been made to produce from bundled fibers a stiffening blade which will serve in every respect as a substitute for whalebone. Success has been attained to the extent of producing stiffening blades, capable of being effectively employed for many purposes for which whalebone, horn strips, &c., have been used, as in dress stiffeners, panniers, &c., but before my invention no blade has been produced which can be effectively employed like a whalebone blade for insertion in the pocket of a corset, after the corset body has been made. One reason of the failure to produce the required article has been the difficulty of binding together a series of fibers in such manner that each shall lie substantially straight and parallel to the others and to the straight sides of the finished blade. I have discovered that by applying a sufficient tension to two or more bundles of fibers and then binding them together while under such tension, the fibers are all straightened and brought parallel to each other, so that the application of the binding confines each to the other and the tendency of any fibers to spring to one side is counteracted by that of others to bend in the opposite direction, so that however crooked the individual fibers may be, a perfectly straight blade is produced. Different means may be employed for applying the tension to the fibers as will be obvious to any skilled mechanic, but I will now describe those which in practice have proved very effective, reference being had to the accompanying drawings, in which—

Figure 1, is an elevation in section of my improved machine. Fig. 2, is a plan of Fig. 1. Fig. 3, is a sectional view illustrating a press for condensing and tempering the material.

The frame A of the machine may be constructed to support one or a series of similar devices, one being shown; and it has bearings for the journals of a shaft carrying two de-

livery reels B, B', and also bearing for a receiving reel C, the construction being such as to permit the ready removal and replacement of each reel. To the platform 2 of the frame, in a line between the reels B, B', and C, is secured an overlaying or thread-winding machine D, constructed in any suitable manner, for instance, as set forth in Letters Patent to J. A. House, No. 259,158; so that two threads are wound in opposite directions upon the strip passing through the machine D. Upon each reel B and B' is wound a cord *a*, consisting of a bundle of fibers, preferably bound together as set forth in the Letters Patent issued to Warner and Tallman, No. 234,757; and the two cords from the two reels B, B', are brought parallel and then bound together by any suitable binding material. Thus they may be bound by threads as they are carried side by side through the overlaying or binding machine D, from which they pass as one cord to the receiving reel C.

A determined resistance is applied in any suitable manner to the passage of each cord or bundle *a*, of fibers to the reel C, so as to create a tension upon the cords that will straighten out the fibers, bring them parallel to each other and maintain them thus until tightly bound together by the threads from the overlaying machine. Thus at the side of each reel B, B', is a band wheel 3 over which passes a friction or brake strap 4 secured at one end to an eye bolt 5, and carrying at the other a weight 6 capable of being varied.

The reel C is driven so as to exert a draft upon the cords sufficient to draw them at the desired speed through the machine D. One mode of driving the reel C is shown and consists of an endless belt 7 passing from a driving wheel 8 around guide-pulleys 9, 9, and around a band wheel 10, secured to the side of the reel C. The driving wheel 8 is secured to a driving shaft carrying a double pulley 12; from which bands 13, 14 pass to the pulleys of the machine D, the shaft 15 being driven from any suitable source of power.

In order to prevent the unwinding of the overlaying threads or material that bind the fibers together, and to also secure a better surface finish, I apply a cement or paste to such overlaying or binding material, or to the surface of the bundle, that will cause the adhe-

sion of the binding to the bundle of fibers. Thus as illustrating one means for applying cement, I use two wells or troughs 17, 18 each having a pasting roller 19 rotating in contact
 5 with the traveling cord, and carrying to the surface thereof a thin layer of cement that secures the binding material to the fibers without penetrating to any considerable extent the interstices between the fibers.
 10 The particular character or construction of the tension device is not material, provided the bundles of fiber may be drawn taut so as to take out the twist or kinks. By thus applying tension to each bundle of fibers separately, each is drawn to the extent needed to
 15 straighten its fibers so that when brought against the other bundle, the two will be perfectly parallel, and when the binding is applied the fibers will be confined in the straight position to which they were brought and the
 20 compound cord thus produced is perfectly straight, composed of substantially straight parallel fibers, in contradistinction to the bent and twisted cords produced by binding together
 25 bundles of fibers without tension as heretofore. After the compound cord is thus made (two or more bundles of fibers being employed) it is flattened by compression for a determined time between heated dies, the
 30 fibers, when of "tampico" or "ixtle" being thus also tempered. This may be effected in any suitable press. Thus the cord *x* may be passed between the steam-heated plates 20, 21

of a powerful press F, and held under pressure until the desired effect is produced. 35

The particular character or construction of the stretching device is not material provided the bundles of fiber may be drawn taut and stretched so as to take out the twist or kinks, and in some instances the stretching may be
 40 effected after the cords are bound together and before or during the pressing or condensing of the compound blade which thereby sets the fibers in their straightened condition.

If desired the cement may be applied by
 45 hand instead of by pasting device as described.

I claim—

In a machine for the continuous manufacture of stiffeners the combination of supports and feeding devices for holding together and
 50 moving longitudinally a number of separate parallel fibrous bundles, separate tension devices for holding each bundle taut while feeding, a binder for binding the bundles together, means for applying cement to the
 55 bundles, and a press arranged for the passage of the bound bundles and to flatten the same, and means for heating the press, substantially as set forth.

In testimony whereof I have signed my
 60 name to this specification in the presence of two subscribing witnesses.

IRA DE VER WARNER.

Witnesses:

F. S. ANDREWS,
 W. P. LONDON.