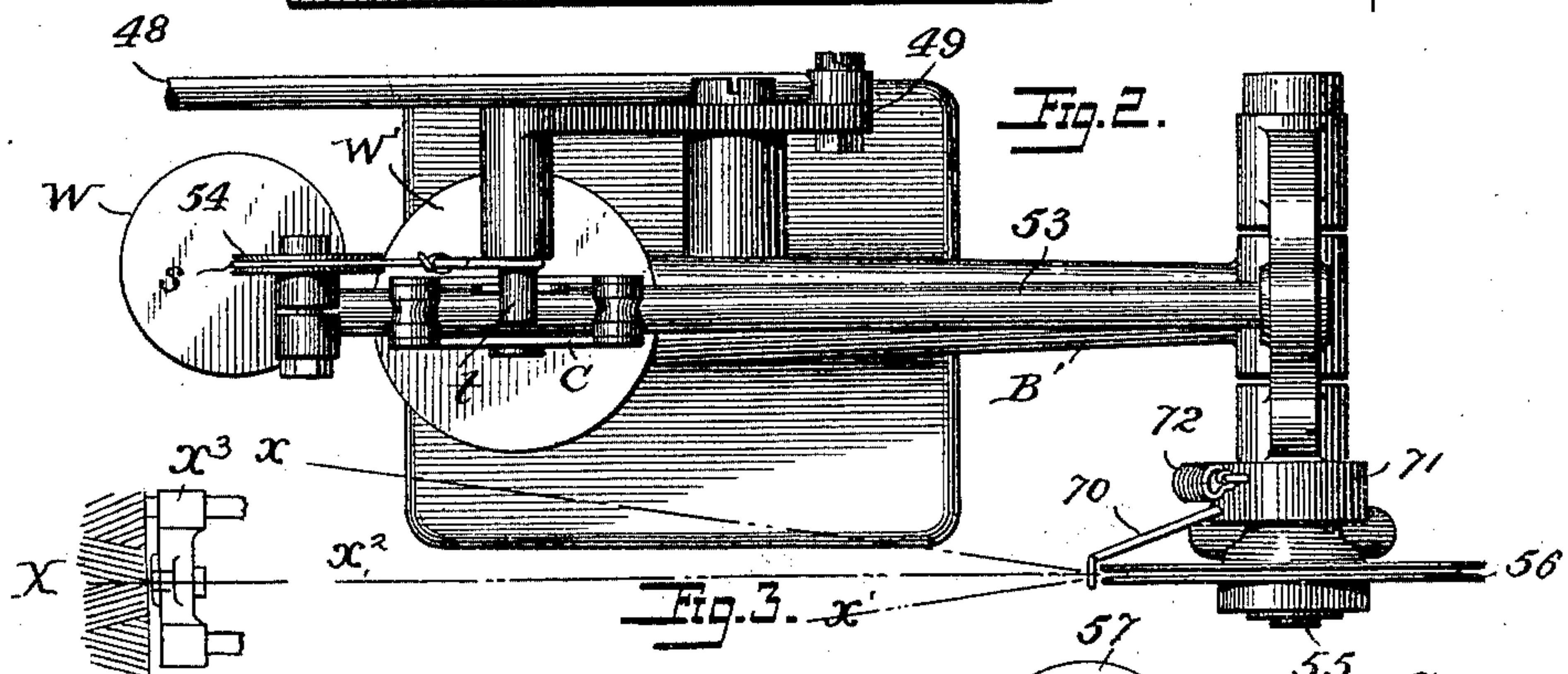
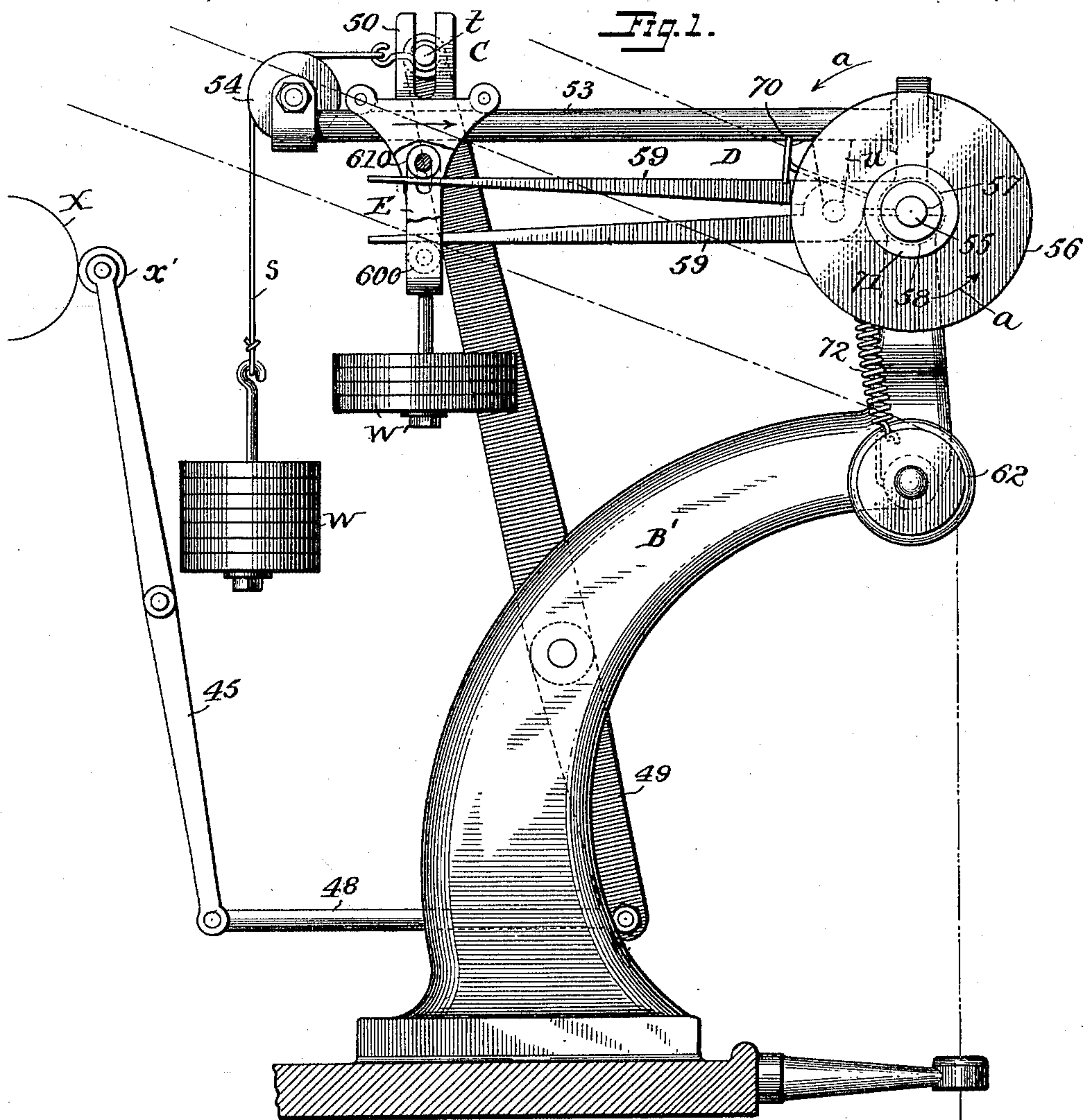


(No Model.)

S. W. WARDWELL, Jr.
REGULATOR FOR THREAD WINDING DEVICES.

No. 509,413.

Patented Nov. 28, 1893.



Witnesses
Geo. G. Hunkel
A. N. Dobson

Fig. 3.

UNITED STATES PATENT OFFICE.

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OF NEWTON, MASSACHUSETTS.

REGULATOR FOR THREAD-WINDING DEVICES.

SPECIFICATION forming part of Letters Patent No. 509,413, dated November 28, 1893.

Application filed November 8, 1892. Serial No. 451,386. (No model.)

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, Jr., a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Regulators for Thread-Winding Devices, of which the following is a specification.

It has been found that in certain classes of winding machines, as for instance, in machines for building up or winding cops of elastic thread, such as silk, if the tension upon the thread is maintained uniform throughout the winding, the stricture upon the outer layers of thread in the cop acting upon the elastic body beneath causes the cop to bulge out at the ends. I have discovered that this may be corrected by gradually decreasing the tension as the cop increases in size, and my invention consists of means whereby such decrease in tension may be automatically effected. It will be evident that different kinds of variable tension devices for retarding the feed or movement of the thread may be used in connection with different appliances between the cop and the tension device for adjusting the latter. In the accompanying drawings, I have shown those which have proved to be effective.

Figure 1 is an elevation of my improved tension regulator; Fig. 2, a plan view; Fig. 3, an enlarged detached view of the friction brake.

The frame B' of the apparatus is constructed in any suitable manner to support the operating parts, and has a bearing for a shaft, 55, to which is connected an ordinary tension wheel, 56, consisting of a flat disk having a V-shaped groove in the periphery. To the shaft, 55, is applied a friction brake, D , which as shown, is in the form of a tongs, the jaws, 57, 58, of which bear upon opposite sides of the shaft and are pivoted together and extended forming two legs or handles, 59, 60. Upon a guide or way, 53, nearly parallel to the legs of the tongs, travels a carriage, C , which has a roller bearing 62 for the lower leg, 60, of the tongs and a slot for the shaft of an upper roller bearing 61, to which shaft is hung a weight W' . It will be evident that when the weight W' is upon the outer end of the

tongs, the leverage will be greater and the friction upon the shaft, 55, will be greater, and that as the weight W' is carried toward the pivot of the tongs, the leverage and the friction will decrease. In order that the weight may be moved toward the pivot of the tongs in proportion as the cop increases in size I combine with the weight certain appliances of any suitable character, whereby it may be shifted according to the increase in size of the cop. Thus assuming that b represents the shaft of a winding machine and X represents the cop, that x^3 is a reciprocating thread guide of the character and operation of that shown in my Letters Patent No. 480,157, and that 45 is a lever having a bearing x' as a roller that bears upon the cop, and that the said lever 45, is connected by a rod, 48, to the lower end of a lever 49, having a pin t that enters a slot in a standard 50, of the carriage C , then in that case, any increase in the size of the cop will swing out the upper end of the lever, 45, which will act as a shifting device and swing in the upper end of the lever, 49, thereby carrying the carriage nearer to the fulcrum of the friction tongs, and reducing the friction, so that as the cop increases in size, the friction will be decreased.

Any suitable form of brake or friction brake may be employed, together with means for reducing its action in proportion as the size of the cop increases. Thus, instead of using a tongs, the lower leg, 60, and the upper jaw might be dispensed with and the upper leg or arm, 59, in such case, could be pivoted to a bracket u , dotted lines Fig. 1, in which case, the lower jaw, 58, only would bear upon the shaft 55, with a varying pressure according to the position of the weight W' .

It will be evident that when the thread is being laid upon the cop, it will travel with the guide x^3 from end to end of the latter, and occupy the position indicated by the diverging dotted lines x, x' on opposite sides of the central position x^2 , Fig. 2.

It will be evident that if the tension upon the tension wheel, 56, is uniform when the thread travels toward either end from the central position x^2 , there must be an increased speed and consequently an increased tension on the thread which will result in irregulari-

ties in building up the cop. I therefore, provide means whereby, without any change in the tension of the friction wheel, 56, the increased feed resulting from the travel of the thread from the central position toward the ends of the cop or the decreased feed, resulting from the travel of the thread from the ends toward the center, will be compensated for. Thus, I combine with the tension device, 56, an arm, 70, having an eye through which the thread passes, with a spring whereby the said arm is drawn downward against the tendency of the thread to lift the arm. As shown, the arm extends from a hub, 71, turning loosely on the shaft, 55, with a spring, 72, tending to turn the hub in the direction of the arrow *a*, Fig. 1, and the thread passes through the eye at the end of the arm, 70, to the machine. The tension upon the spring is so adjusted that normally the parts will occupy the position shown in Fig. 1, but if there is any increase in the feed resulting from the thread traveling toward the end of the cop, the tension upon it will slightly increase, in which case, the arm, 70, will be lifted to supply an additional quantity of thread, while the decrease resulting from the thread traveling toward the central position, will in like manner be taken up by the descent of the arm under the action of the spring.

Instead of the spring a weight may be employed to the arm, 70, to depress it with like effect.

It will be evident that different shifting devices altered in position as the cop increases in size, will if connected with the movable weight *W'* act with like effect.

Without limiting myself to the precise construction and arrangement of parts shown, I claim as my invention—

1. The combination with a tension device

adapted to receive and act on a traveling thread and means for varying the action thereof, a cop to which the thread passes, a movable bearing supported to be shifted on the increase in the size of the cop, and connections between said bearing and the means for varying the action of the tension device, substantially as set forth.

2. The combination of the tension device adapted to receive and act on a thread passing to a cop, friction brake for said tension device, movable weight for varying the action of the brake, a lever, 49, connected to move said weight, and a lever, 45, connected with the lever, 49, and arranged to be shifted by the increase in the size of the cop, substantially as set forth.

3. The combination of the tension device, its shaft, brake device in the form of a tongs, carriage having bearings for the legs of said tongs, and carrying a weight bearing upon one of said legs, a weight connected to shift the carriage in one direction, a lever connected with the carriage, and with devices arranged to be shifted by the increase in the size of the cop, substantially as set forth.

4. The combination of a cop, a guide reciprocating from end to end of the cop in contact therewith, and a tension device arranged between the yarn supply and said guide and constructed to secure a uniform tension on the thread, and a yielding arm bearing on the thread between the tension device and the guide, substantially as described.

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

SIMON W. WARDWELL, JR.

Witnesses:

CHARLES E. FOSTER,
C. S. DRURY.