(No Model.) 2 Sheets—Sheet 1.

W. E. WALSH.

THREAD BREAKING MECHANISM FOR DOUBLING MACHINES.

No. 436,064. Patented Sept. 9, 1890.

FIG. 1.

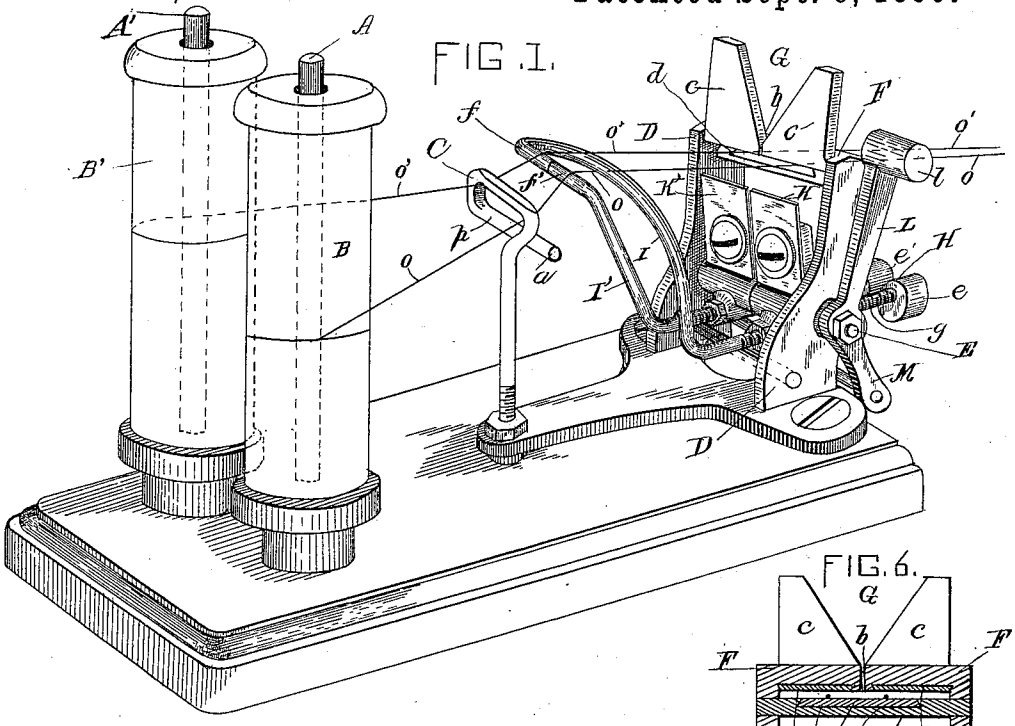
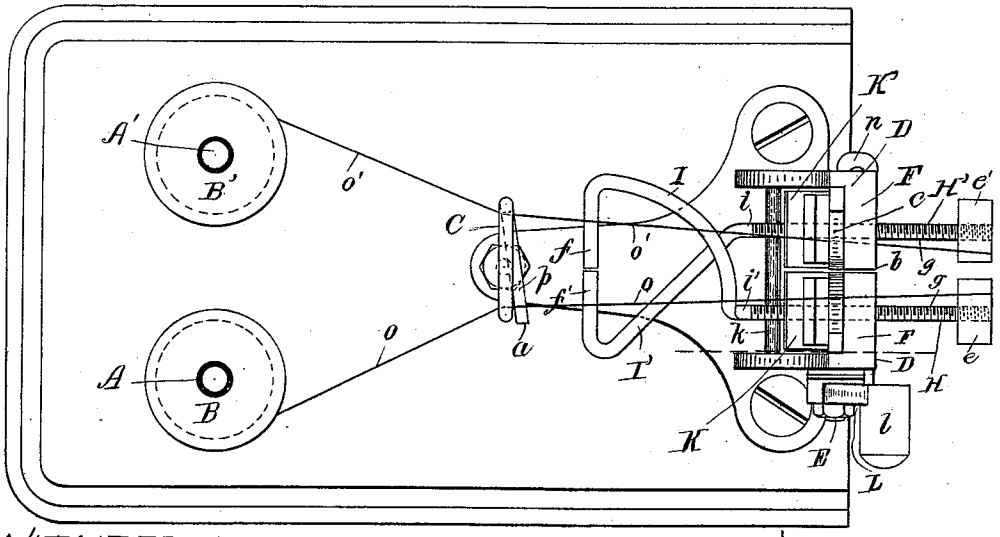


FIG. 6.

FIG. 2.



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FIG. 3.

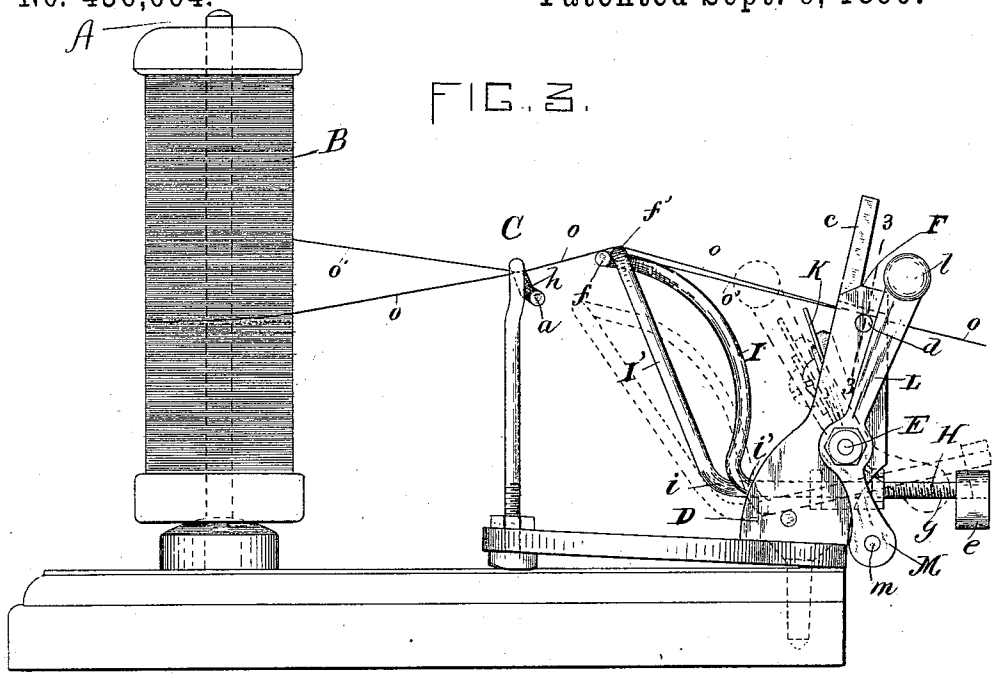


FIG. 4.

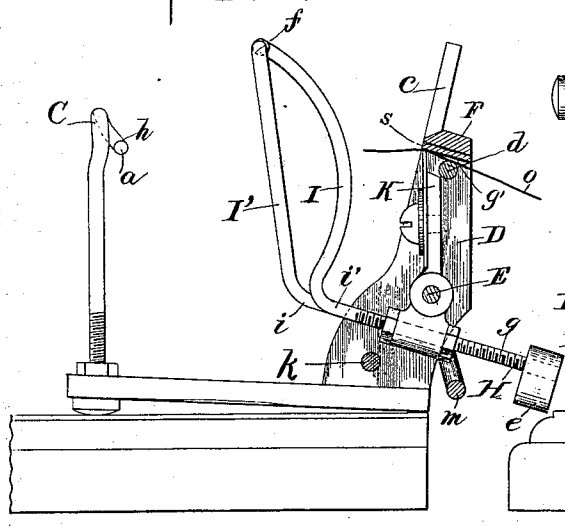
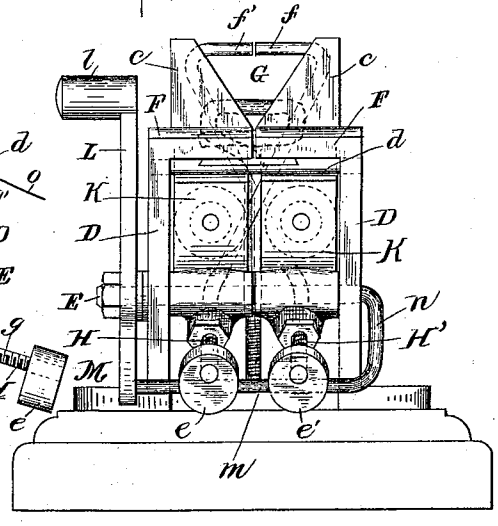


FIG. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM E. WALSH, OF LOWELL, MASSACHUSETTS.

THREAD-BREAKING MECHANISM FOR DOUBLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 436,064, dated September 9, 1890.

Application filed October 7, 1889. Serial No. 326,218. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. WALSH, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Thread-Breaking Mechanisms for Doubling-Machines, of which the following is a specification.

My invention relates to thread-breaking mechanism for doubling-machines, whereby when one of the threads becomes broken or runs out before reaching the doubling-spool the other thread will be cut or broken, so as to prevent a single thread from being wound continuously with the previously doubled thread.

My improvements consist in two balanced levers, over the lighter arm of each of which extends one of the two doubling-threads, and each of which levers is provided with one upwardly-projecting knife, over which also extends the thread that passes over the light arm of the adjacent lever, whereby when the light arm of one lever is released from the pressure of its thread by the thread being broken or running out, the knife of said lever will operate to cut the other thread.

My improvements also consist in certain details of construction, all as more particularly hereinafter described.

In the accompanying drawings, Figure 1 illustrates, in perspective view, my improved stop mechanism in operative combination with two spools of yarn, the threads of which are to be doubled or spun together into one thread. Fig. 2 is a plan of the same. Fig. 3 is a side elevation, the dotted lines illustrating the position that the parts should assume during the threading of the apparatus. Fig. 4 illustrates a vertical section through the cutting mechanism of the apparatus. Fig. 5 is a front elevation. Fig. 6 is a detail of a modification.

Similar letters represent like parts in all the figures.

A and A′ are two vertical stationary spindles, upon which are loosely mounted the spools of single thread B B′. A short distance forward from a point substantially midway between the spindles A A′ is a vertical rod, the upper end of which is bent to form a horizontally-elongated hook-eye C, and which is parallel with a line joining the spindles, the free end *a* of said hook or eye almost, but not quite, touching the loop of the hook and extending a slight distance beyond said loop.

Forward of the hook-eye C are two upright standards D D, forming supports near their lower ends for a shaft E, which is parallel with the hook-eye C and a line joining the spindles A A′.

Each standard D D is provided at its upper end with a horizontal bar or lateral extension F, which two bars extend toward each other so as to nearly meet at a point midway between the standards D D, leaving a slit *b* between the bars E E. Extending upward from each of the bars F is a triangular piece *c*, having an oblique edge extending outward and upward from the inner end of the bar F, the two pieces *c c* forming a wedge-shaped opening G between said pieces, whose apex terminates at the slit *b*. A horizontal rod or bar *d* is supported by the standards D D a little below the bars F F. Loosely pivoted upon the shaft E are two weighted levers H I H′ I′, and weights *e e′* are attached to the short forward arms H H′ of said levers. The back and longer arms I I′ of said levers cross each other and have lateral horizontal projections *f f′* at their free ends, which nearly meet at their inner ends.

K K′ are two flat plates or blades, which are secured to the weighted levers at their fulcra or at the shaft E, and which extend upward from said shaft back of the rod *d* and terminate in horizontal edges which bear against an inclined under surface *g′* of the bars F F when said knives are elevated for cutting the threads.

The weights *e e′* may be attached adjustably upon the arms H H′ by means of a screw-thread *g g* on the latter and an internal screw-thread in the former, as shown in the drawings.

The levers H I and H′ I′ should be so balanced by the weights *e e′* that the knives K K′ will rest against the under surface of the bars F F until a slight downward pressure upon the arms I I′ will force them down against the power of the weights *e e′*, and as soon as this pressure on the arms I I′ is relieved the knives will immediately drop back against said bars.

The forward play of the levers is limited

by the blades K K′ coming in contact with the bars F F, and the backward play of the levers is limited by the backwardly-extending portions *i i′* of the arms I I′ falling upon the rod *k*.

Attached or pivoted to one end of the shaft E, outside of one of the standards D or D′, is a balance-lever, the longer upwardly-extending arm L of which is provided with a weight *l* and a short downwardly-extending arm M, having attached to it forward of the standard D D′ and below the arms H H′ a rod or bar *m*.

When the arm L and its weight *l* are pushed back, the rod *m* will raise the arms H H′, and consequently lower the arms I I′ and the knives K K′ away from the rod *d* and maintain them in this position by the preponderance of the weight *l*. When the arms H H′ are relieved from the pressure of the bar *m* by moving the arm L of the balance-lever forward, the weights *e e′* will immediately lower the arms H H′, raise the arms I I′ and knives K K′, and bring the latter back against the inclined under surface *g′* of the bars F F.

The shaft E and the rod *m* may be made from one piece of wire bent around at the loop *n* outside of one of the standards, as shown in Figs. 2, 4, and 5.

In threading, the upper arm L of the balance-lever is rocked backward, thus raising its lower arm M, the rod *m*, and the arms H H′, and consequently lowering the knives K K′ and arms I I′. The hook-eye C is now readily accessible to the operator, and this is now threaded by the threads *o o′* from the spools B B′ being passed under the lower horizontal portion *p* and around the end *a*. The threads *o* and *o′* are then passed over the projections *f f′* of the arms I I′ and over the blades K K′, down the wedge-shaped opening G, and through the slit *b* onto the rod *d*. The thread *o* will pass over the projection *f′*, over the blade K, under the bar F, and the thread *o′* will pass over the projection *f*, over the blade K′, and under the bar F, and both threads will then be united and fastened upon the doubling-spool. The position of the parts will then be as shown by the dotted lines in Fig. 3. The arm L of the balance-lever will then be swung forward, releasing the bar *m* from the weighted arms H H′, and the tension of the two threads on the respective projections *f f′* will keep the arms I I′ down. The position of the parts will then be as shown in Figs. 1 and 2 and the full lines in Fig. 3. If either thread should break or run out, the pressure on the projection *f* or *f′* over which said thread had passed will be relieved, and the weighted arm H or H′ will raise the arm I or I′ and the opposite blade against the under side of the bar F so as to pinch or wedge the opposite thread and to break it off when pulled, to prevent it from being wound alone and singly with the previously doubled thread. For example, if the thread *o* should break, the pressure on the projection *f* and its arm I will be relieved, and it and the blade K which is supported on said arm will be raised or thrown forward by the weighted arm H, the edge of said blade coming against the lower surface *g′* of the bar F, when the thread *o* will be broken.

The bar *d* may be made of case-hardened metal to prevent the constant sliding of the threads from wearing it out too readily, or an extra piece of metal *q* harder than the bar *d* may be inserted in the top of said bar by means of dovetails or otherwise, for the same purpose, as shown in Figs. 1, 4, 5, and 6. Short pins *r r* (see Fig. 6) may extend upward from the rod *d* or from the piece *q* to keep the threads apart and in their proper positions over the knives and projections *f f′* while said threads are being drawn upon the doubling-spool.

An extra piece of metal *s* harder than the bars F may be inserted in the bottom of each of said bars for the same purpose as that of the piece *q*—viz., to prevent the constant friction of the threads from wearing grooves in the bottom of the bars F.

What I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for cutting or breaking one thread of a doubling-machine when the other thread becomes broken or run out, consisting of two weighted levers, each having an upwardly-extending blade and a support upon the lighter arm for one thread, the lighter arms of the two levers crossing each other, and the thread-supports of each arm being opposite or back of the blade of the adjacent lever, and a fixed bar or bars with which the edges of the blades coact, all substantially as and for the purposes described.

2. The combination, with two weighted levers, each having an upwardly-extending blade and a support upon the lighter arm for one thread, the lighter arms of the two levers crossing each other, with the thread-support of each arm opposite or back of the blade of the adjacent lever, of a bar parallel to the edges of the blades and with said edges bearing against the inclined under surface of said bar when the blades are in their raised positions, all substantially as and for the purposes described.

3. In combination with two weighted levers, each having an upwardly-extending blade and a lateral support upon the lighter arm for one thread, the lighter arms of the two levers crossing each other, and the thread-supports of each arm being opposite or back of the blade of the adjacent lever, a fixed bar with which the edge of each blade coacts, and an oblong hook-eye back of and parallel with the lateral thread-supports, all substantially as and for the purposes described.

4. In combination with two weighted balance-levers, each having an upwardly-projecting blade and having the lighter arms thereof crossing each other, standards for supporting

said levers, and the bars F F, also supported by said standards, all substantially as and for the purposes described.

5. In combination with two weighted balance-levers, each having an upwardly-projecting blade and having the lighter arms thereof crossing each other, the rod *d*, standards for supporting said levers and rod, the bars F F, having the slit *b* between said bars, and plates extending upward from the bars F F, with the wedge-shaped opening G between said plates, all substantially as and for the purposes described.

6. In combination with two weighted levers, each having an upwardly-extending blade and a lateral thread-support on its lighter arm, and having the lighter arms thereof crossing each other, a fixed bar with which the edge of each blade coacts, a stationary eye-thread guide back of said lighter arms, the balance-lever L M, and the rod or bar *m*, for raising the weighted arms of the weight-levers and thus lowering their lighter arms, all substantially as and for the purposes described.

7. In combination with the rod *d*, the piece *q*, having the projections *r r* thereon, and bars extending a little above and parallel with said rod, all substantially as and for the purposes described.

8. The combination of the hook-eye C, weighted levers H I and H′ I′, knives K K′, rod *d*, bars F F, balance-lever L M, and rod *m*, all substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of September, A. D. 1889.

WILLIAM E. WALSH.

Witnesses:
JOHN B. SWIFT,
GEO. H. STEVENS.