

(No Model.)

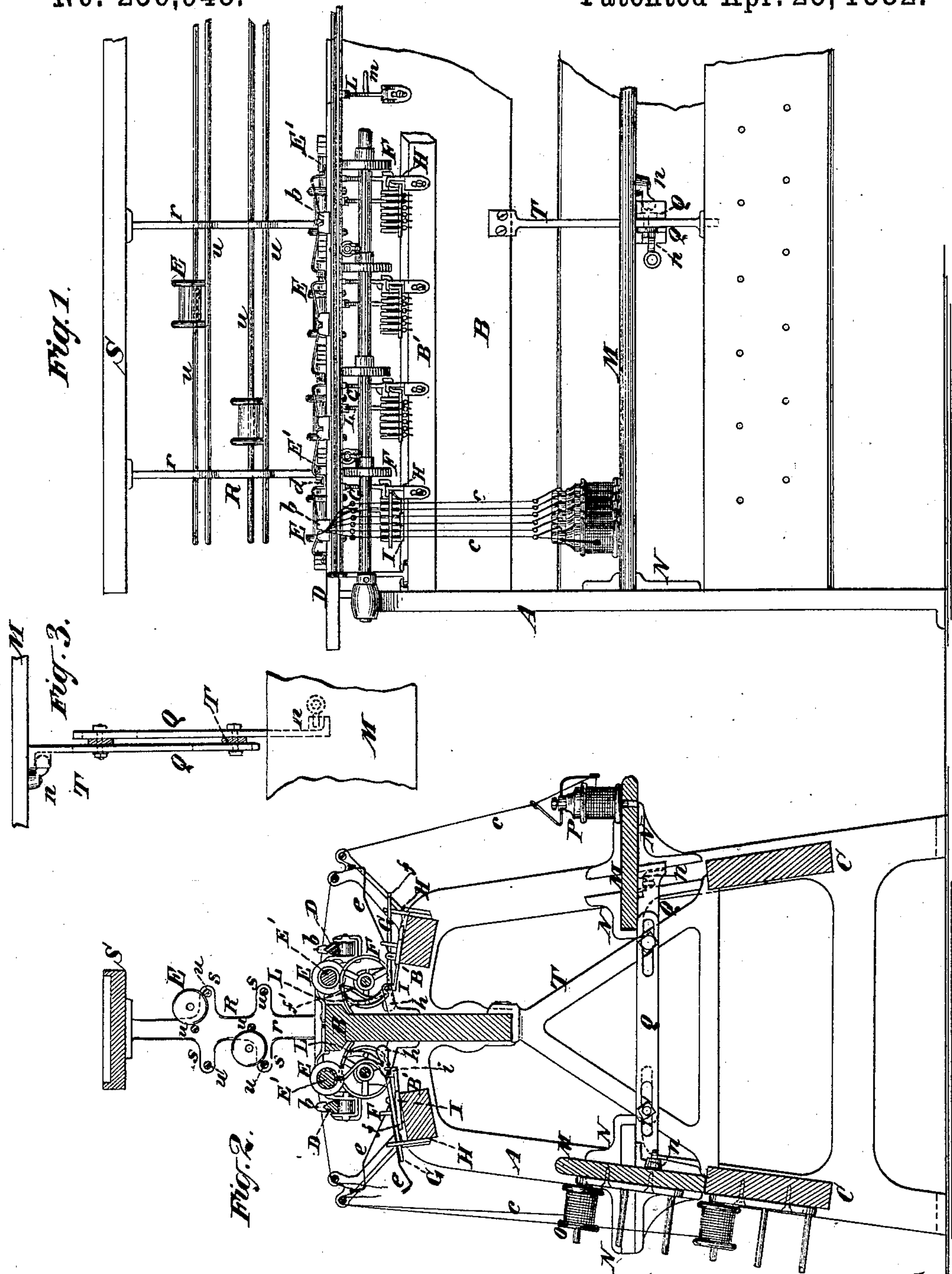
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J. E. ATWOOD.

MACHINE FOR DOUBLING AND WINDING SILK AND OTHER FIBROUS MATERIALS.

No. 256,948.

Patented Apr. 25, 1882.



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(No Model.)

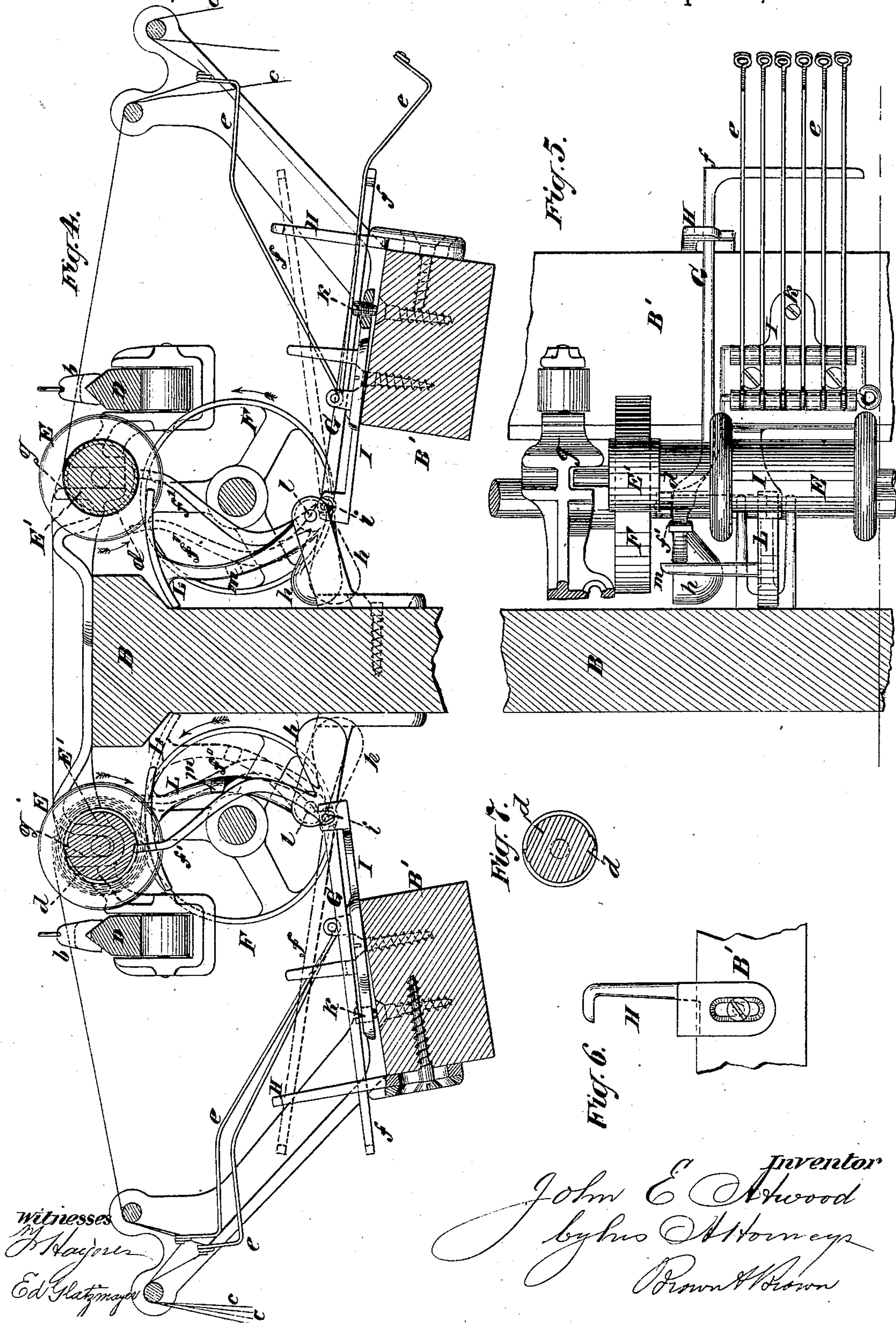
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# UNITED STATES PATENT OFFICE.

JOHN E. ATWOOD, OF STONINGTON, CONNECTICUT.

MACHINE FOR DOUBLING AND WINDING SILK AND OTHER FIBROUS MATERIALS.

SPECIFICATION forming part of Letters Patent No. 256,948, dated April 25, 1882.

Application filed May 20, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. ATWOOD, of Stonington, in the county of New London and State of Connecticut, have invented certain  
5 new and useful Improvements in Machines for Doubling and Winding Silk and other Fibrous Materials, partly applicable to Spinning-Frames, of which the following is a description, reference being had to the accompanying  
10 drawings, forming part of this specification.

This invention relates, in part, to machines for doubling two or more strands of fibers together, in which ratchets on the spindle-heads of the winding-bobbins are used to stop the  
15 spindles through the intervention of drop wires and levers. Ordinarily in such machines the spindle-heads, when stopped, become worn out of shape from resting on the friction-wheels that drive them.

20 To remedy this defect, the invention consists in the combination, with a winding-bobbin having a ratchet spindle-head and a friction-wheel for driving the bobbin, of drop-wires and a drop-lever of novel construction and arrangement, whereby the same, when brought  
25 within the reach of the ratchet-teeth on the spindle-head, is carried under and raises said head from its seat on the friction-wheel, thus preserving the shape of the head and preventing it from acting as a brake on said wheel.

30 The invention also consists in the combination, with an elbow drop lever or pawl and a rail or support for the same, of an adjustable stand carrying said lever, and an adjusting-screw for adjusting the stand upon said rail or support, as hereinafter more particularly described.

35 The invention also consists in a combination, with a winding-bobbin spindle and a drop-lever or stop-lever operating upon said spindle to stop it and its bobbin, of a sector-faced lever arranged to be so operated by the friction upon it of the material upon the bobbin, when  
40 a sufficient quantity has been wound thereon, that the said sector-faced lever will operate on the drop-lever or stop-lever to make the latter produce the stoppage of the spindle and bobbin.

The invention also consists in the combina-

tion, with a winding-bobbin and a spindle 50 therefor, having a ratchet on its head; and means for driving said spindle, of an elbow drop-lever which operates as a pawl on said ratchet to stop said spindle, and a sector-faced lever actuated by the material on the bobbin, 55 and acting through the drop-lever to stop the spindle when sufficient material is on the bobbin, as hereinafter more particularly described.

The invention also consists in the combination, with a frame provided with cross-slotted 60 or cross-grooved pocket-pieces, of removable boards for holding the strand-carrying devices, fitted to said pocket-pieces and adapted to be adjusted to stand upright to form bobbin-boards for doubling from revolving bobbins or 65 to stand horizontal to form jack-boards for using spindles and fliers, and adjustable braces for securing and holding said boards in either position in which they are placed.

In the accompanying drawings, Figure 1 represents a front view of a machine, in part, for 70 doubling and winding silk or other fibrous material; Fig. 2, a transverse vertical section of the same; Fig. 3, a plan view of certain supporting-braces for securing and holding the 75 removable boards on which are the strand-carrying devices; Fig. 4, a transverse vertical section of the upper part of the machine upon a larger scale; Fig. 5, a sectional top view of the same in part, also upon a larger scale; Fig. 6, 80 a view of a stop which checks or controls the movement in one direction of the drop levers or pawls that raise and stop the winding-bobbins; and Fig. 7 represents a transverse section of one of the ratchets on the spindle-heads. 85

Similar letters of reference designate corresponding parts in all the figures.

A indicates one of the uprights of the main framing of the machine, and B B' certain upper longitudinal tie beams or rails connecting said 90 uprights.

C C are lower bobbin-boards, which may be fixed and also serve to brace the frame.

DD are the transverse bars arranged on opposite sides of the beam B, and fitted with 95 thread-guides *bb*, through which the strands *cc* pass to the horizontal winding-bobbins E E, the heads E' E' of whose spindles are rotated



or driven by lower friction-wheels, F F. On the spindle-heads E' E' are ratchets  $d$   $d$ , (shown most clearly in Fig. 7,) with the teeth of which drop levers or pawls G G engage to stop the winding-spindles and their bobbins E E in case of the breaking or giving out of any of the strands, such stoppage being controlled by the falling of any one or more of a series of drop-wires,  $e$   $e$ , through which the strands pass to the winding-bobbins. This control of the pawl by the action of the drop-wires is sufficiently well known in other ratchet arrangements applied to the spindle-heads to render unnecessary any further explanation here than that the falling of any of the drop-wires on the drop lever or pawl causes the latter, by the weight of said wire or wires, to be thrown out of balance and into action on the ratchet of the spindle-head. But the drop levers or pawls G differ very importantly from other drop levers or pawls in their construction and operation. Thus said levers G are of elbow form, being composed of what may be termed a "horizontal" arm,  $f$ , and a "vertical" arm,  $f'$ , the latter of which at its upper or free end causes the lever to act as a pawl on the ratchets  $d$  of the spindle-heads E' when said end of the arm  $f'$  is brought within the reach of the ratchet-teeth by the weight of one or more fallen drop-wires,  $e$ , on the horizontal arm  $f$  of the lever, as shown by full lines on the right hand of Fig. 4. This causes the upper or free end of the arm  $f'$  not merely to strike or engage with a tooth of the ratchet  $d$ , but to pass under the spindle-head E' and to raise it from contact with its driving friction-wheel F, thereby not only stopping the motion of the spindle-head and its bobbin, but preventing the spindle-head from becoming worn out of shape by the rubbing of the rotating friction-wheel on one portion of said head when arrested, and preventing said head from acting as a brake on the friction-wheel. To provide for this action, the spindle-heads E' are arranged to work in open bearings  $g$ , which will permit of said heads being raised.

The drop levers or pawls G, when not in action, are kept in position and out of the way of the spindle-heads by counterbalance-weights  $h$  and stops H, as shown by dotted lines in Fig. 4. Furthermore, the levers G are constructed or provided with adjustable fulcrums  $i$ , to secure a proper height or position of said levers or of the outer or free ends of their arms  $f'$  relatively to the spindle-heads under and against which they act. This is advisable to meet wear and other requirements, and may be accomplished by supporting said levers in adjustable stands I, secured to the rails B' in such manner, by screws or otherwise, that said stands may be tilted and adjusted to raise or lower the fulcrums of the levers G by means of adjustable or set screws  $k$ , screwed into the outer ends of the stands and bearing on the rail B'. The stops H are also adjustable up or down on the rails B', to vary the height to which the arms  $f$  of the levers G may be raised,

and so to adjust the relation of the arms  $f'$  of said levers to the spindle-heads E'.

To stop the bobbins E when full, and to prevent them from having a greater quantity of fibrous material wound upon them than is desired, a pivoted arm or lever, L, is arranged below either winding-bobbin E. This lever has its upper free end of sector or segmental form, concentric with its fulcrum  $l$ , or nearly so, and is set at such a height as to cause said end to come in contact with the material on the bobbin when full, whereby the material is caused to move said lever by its friction against the segmental end of the lever, as shown in Fig. 4, to arrest the action of the bobbin. Said lever L is made adjustable to vary its height or position relatively to the bobbin to adapt it to different required amounts of material on the bobbin. This may be done by arranging its pivot or fulcrum  $l$  in or upon an adjustable bracket secured to the rail B. Any suitable stop-lever might be associated with the lever L to arrest the motion of the bobbin; but it is preferred to have it operate the drop-lever G. To this end the lever L is provided with a side arm,  $m$ , which, as the upper free end of the said lever is drawn under the bobbin by the friction of the material on the latter, strikes and moves the drop lever or pawl G to stop the bobbin and raise it from contact with its driving friction-wheel, as hereinbefore described. (See Fig. 4.)

Arranged above the lower bobbin-boards, C C, are upper boards, M M. These boards are fitted within cross-slotted or pocket pieces N N on the uprights A of the main frame, to provide for their removal when required and conversion, accordingly as they are inserted into the cross-slotted or pocket pieces N, either into upper bobbin-boards for carrying a series of strand-bobbins, O, as shown at the left hand of Fig. 2, or into jack-boards for working with spindles and fliers P in the place of said strand-bobbins, as shown at the right hand of said figure. Plates carrying pins for the bobbins to turn upon are fastened to said boards when the latter are used to carry strand-bobbins. These changed positions of the boards M are upright or slightly inclined and horizontal, as seen in Fig. 2. To secure and hold said boards M in either position, and to prevent them from springing when in place, any number of supporting-braces, Q Q, are used intermediately of the uprights A. These braces are constructed in two longitudinal sections fitted to lie side by side, and are provided with longitudinal slots to admit of their adjustment in direction of their length, and to hold them together by bolts passing through the slots and through intermediate standards, T, secured to the rails B and C C. They are secured at their ends to the boards M by buttons  $n$ , attached to said boards, and serving to secure the latter in whichever of their two positions they may be placed; or any other suitable fastenings may be used. The pocket-pieces N



may be cast on the frame or made by bolting plates or strips thereto.

R is a bobbin-rack arranged longitudinally over the center of the main frame. The use of  
5 this rack is to facilitate the changing of full for empty bobbins, in which case it is desirable to remove the full ones from their spindles and deposit them in a convenient place for subsequent use, and from an equally convenient place to take empty bobbins for the  
10 purpose of placing them on the spindles. Said rack is composed of uprights *r*, mounted centrally on the main frame, transverse arms or branches *s*, projecting from opposite sides or  
15 edges of said uprights, and rods *u*, arranged to run lengthwise of the machine and passing through or connecting said uprights and arms or branches, thereby causing the whole structure to form a series of racks on opposite sides  
20 of the uprights. A bobbin-rack thus constructed is not only cheap, serviceable, and convenient, but does not exclude the light, and its uprights *r* form a stand for a bobbin-shelf, *S*, similar to the shelves now used in a certain  
25 class of narrow frames for the manipulation of textile threads.

The construction of the bobbin-rack and the arrangement of the bobbin-shelf thereon form no part of this invention.

30 What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a winding-bobbin having a ratchet spindle-head and a friction-wheel for driving said bobbin, of drop-wires  
35 and a drop lever or pawl having its fulcrum arranged as described, whereby when the said lever or pawl is brought into operation by the breakage or giving out of a thread the said lever or pawl, by its action on the ratchet, pro-

duces not only the stoppage of the bobbin, but  
40 also raises the spindle out of contact with the driving-wheel, substantially as herein described.

2. The combination, with the elbow drop lever or pawl and the rail or support for the  
45 same, of an adjustable stand carrying said lever and an adjusting-screw for adjusting the stand upon said rail or support, substantially as and for the purpose herein set forth.

3. The combination, with a winding-bobbin  
50 spindle and means of driving the same and a stop-lever serving to stop the said spindle, of a sector-faced lever to be actuated by the friction of the material wound on the bobbin, and serving to bring the said stop-lever into opera-  
55 tion on the spindle, substantially as specified.

4. The combination, with a winding-bobbin and a spindle therefor having ratchet-teeth on its head, and means for driving the said  
60 spindle, of the drop-lever *G*, which operates on said ratchet to stop the said spindle and the sector-faced lever *L*, actuated by the material on the bobbin and acting through the drop-lever to stop the spindle when sufficient material  
65 is on the bobbin, substantially as herein specified.

5. The combination, with the frame provided with cross-slotted or cross-grooved  
pocket-pieces, and the removable and convertible bobbin-boards or jack-boards fitted to said  
70 pocket-pieces, of supporting-braces *Q*, adjustable to be adapted either to bobbin-boards or jack-boards, substantially as specified.

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