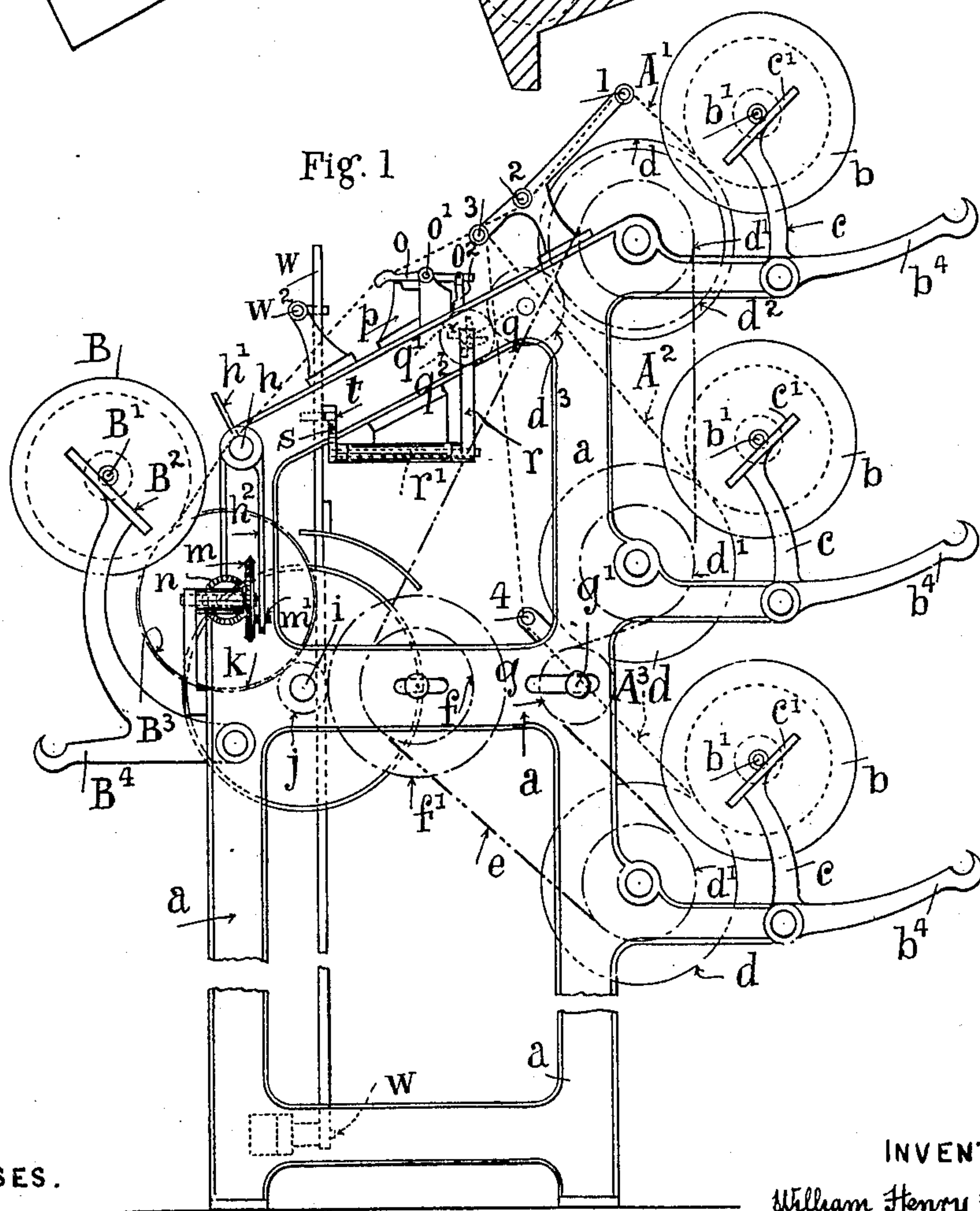
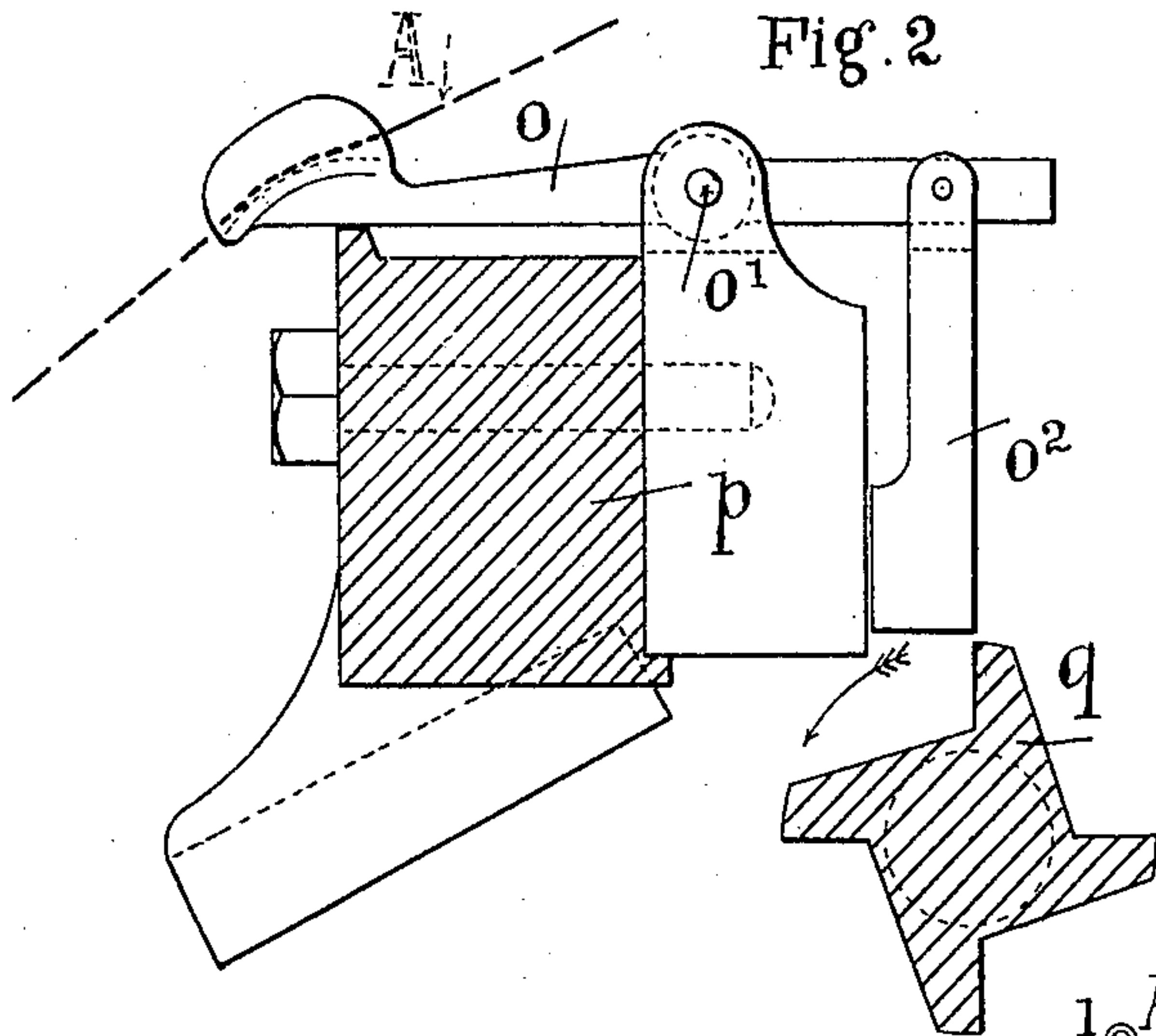


W. H. HOYLE & T. BARKER.  
DOUBLING AND WINDING MACHINE.  
APPLICATION FILED OCT. 24, 1907.

912,847.

Patented Feb. 16, 1909.

3 SHEETS—SHEET 1.



WITNESSES.

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William Henry Hoyle  
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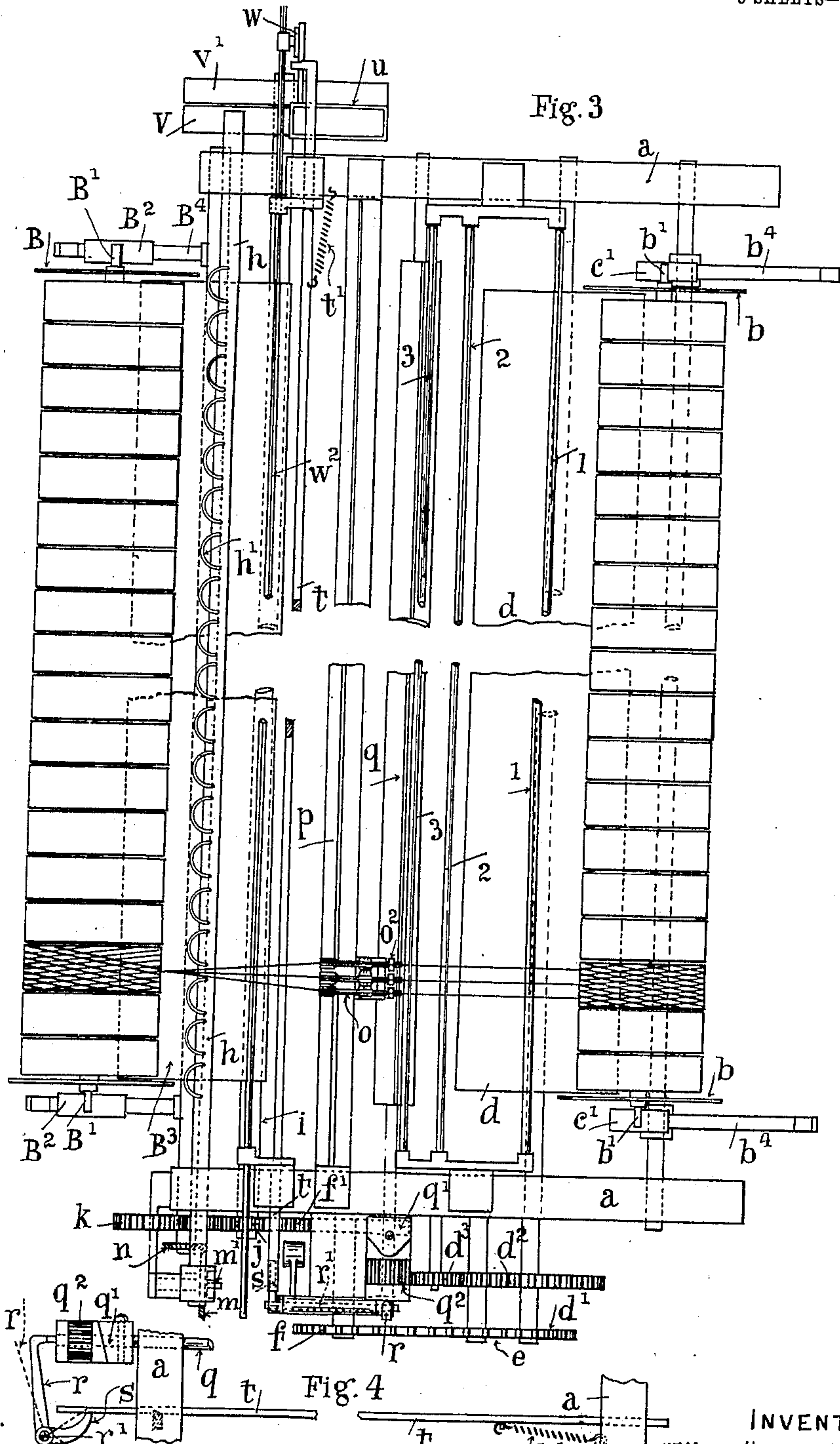
By their Attorney *W. H. Hoyle & T. Barker*

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3 SHEETS—SHEET 2.



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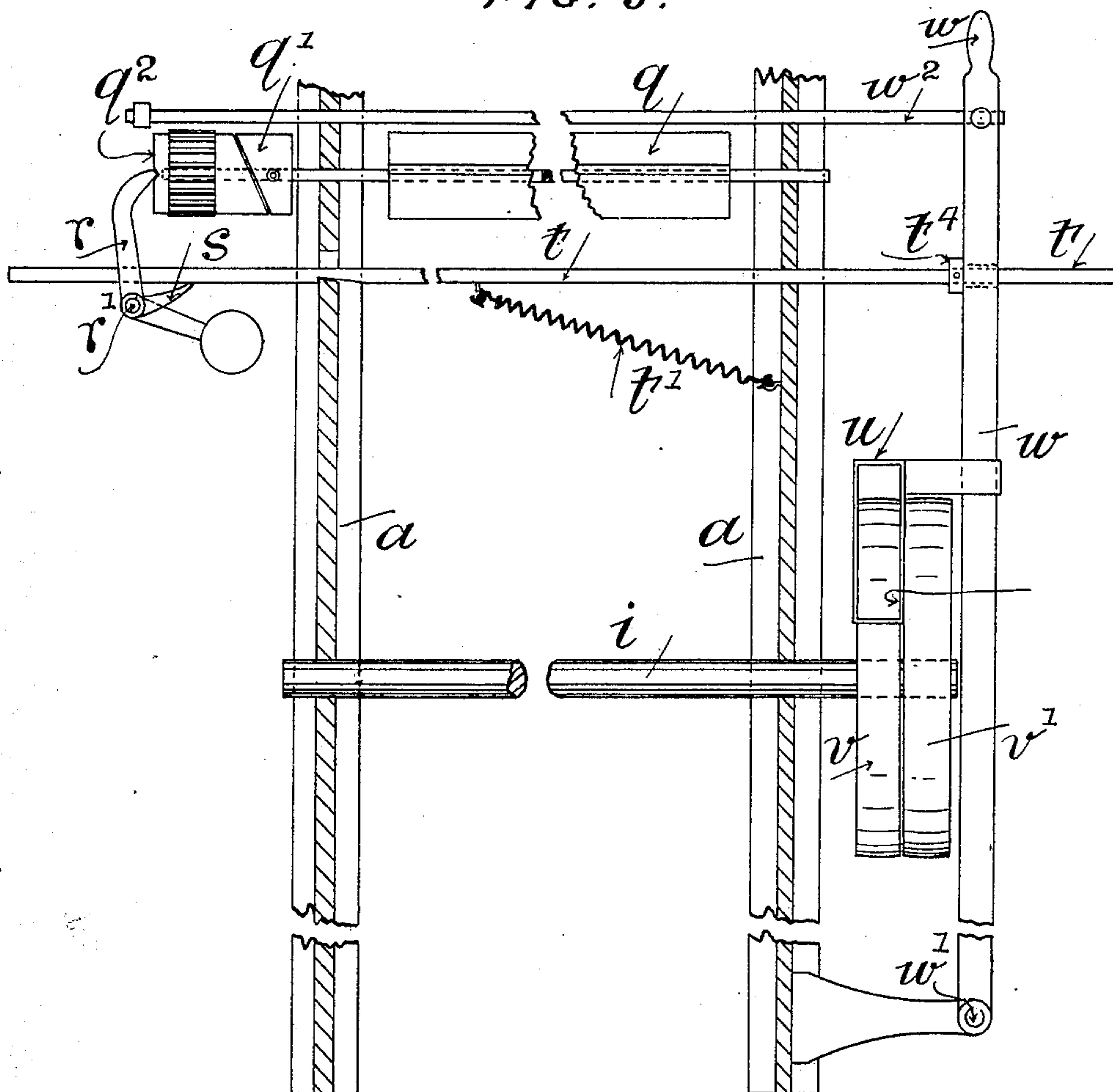
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3 SHEETS—SHEET 3.

FIG. 5.



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# UNITED STATES PATENT OFFICE.

WILLIAM HENRY HOYLE AND THOMAS BARKER, OF BOLTON, ENGLAND.

## DOUBLING AND WINDING MACHINE.

No. 912,847.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed October 24, 1907. Serial No. 399,030.

*To all whom it may concern:*

Be it known that we, WILLIAM HENRY HOYLE and THOMAS BARKER, subjects of Great Britain, residing, respectively, at 86 Chorley New Road, Bolton, in the county of Lancaster, England, cotton-spinner, and 352 Church Road, Smithills, Bolton, aforesaid, consulting engineer, have invented a new and useful Doubling and Winding Machine, of which the following is a specification.

This invention relates to apparatus to be associated with a system of working fibrous material involving the use of a machine which we have invented for elongating or re-  
condensing material from condenser cards in separate or doubled ends (and if necessary for imparting twist thereto) the features of which system or machine are patented in the United States No. 708046 and No. 739877 and in Great Britain under Nos. 6575 and 6576 of 1903, the present invention relating particularly to apparatus for doubling the ends of material from a condenser card ready for feeding to the new elongating or drafting machine. The condenser ends fed to such elongating machines have sometimes been doubled, as will be seen from certain of the prior patents, and under this present invention we still double the ends, making such doubling an intermediate process and utilizing a suitable apparatus for this purpose. The novelty lies in taking bobbins from the condenser card, unwinding the material, doubling, traversing, and batching or re-  
winding the doubled or grouped ends on a bobbin or bobbins, and the apparatus to be described is such a one as will accomplish this object and forms a machine constructed for the purpose.

The attached drawings show a good and convenient apparatus for accomplishing the doubling and batching of sets of grouped ends on a long bobbin in sections, in accordance with our invention.

Figure 1 is an end elevation of such apparatus. Fig. 2 is a detail view of part of a stop-motion with which the apparatus may be fitted. Fig. 3 is a plan view of Fig. 1. Fig. 4 is a diagram showing the knock-off bar or rod and other parts of the stop motion. Fig. 5 is a sectional view showing the arrangement for shifting the belt.

In such a system of doubling yarn for feeding to the new elongating or drafting machine and such as our invention embraces we use an apparatus consisting of suitable

framework and conveniently end-frames or standards *a, a*, which frames are designed to support a number of long flanged or other bobbins such as those marked *b b b*. These bobbins *b b b* are such as have received the condensed ends or product of condenser cards, which condensed ends are wound thereon in the condenser card as will be inferred. These bobbins are so supported as to be readily introduced and removed in the doubling frame and in the drawings their trunnions *b' b' b'* are shown resting on inclined faces *c'* carried by arms *c* secured to the frames. The bobbins *b b b* are arranged to be driven so as to cause same to rotate and pay off the material. Such driving may be in any known way, many ways being obvious. One way would be to allow each of said bobbins to sit or rest against a drum, three drums *d d d* being provided in the drawing, one for each bobbin. In some cases two or more drums to each bobbin may be used, said drums being mounted in bearings and caused to rotate.

The drums *d d d* are shown carrying chain wheels *d' d' d'* on their axles, and with these wheels an endless chain *e* gears, such chain being driven by the chain wheel *f* the chain also passing partly around a tensioning chain wheel *g* mounted on an adjustable stud or axle *g'*. The chain wheel *f* is compounded with or attached to a spur wheel *f'* and the spur wheel *f'* may be a change wheel, the spur wheel or pinion *f'* being driven from a pinion *j* on the main shaft *i*. Instead of using chain wheels and a chain, these drums may be driven by gear wheels, or in other known manner.

The machine may obviously be designed to take any required number of bobbins and for each head a corresponding drum is provided and driven in the right direction.

The condenser rubbed ends passing from each bobbin are led over guiding parts to a traverse bar or traversing device and in the system shown, the ends *A'* from the top bobbin *b* passes over a bar 1, under bar 2, and over bar 3. Ends *A<sup>2</sup>* pass over bar 3; while ends *A<sup>3</sup>* pass under bar 4 and over bar 3.

The way of guiding the yarn over and under or by suitable parts may be greatly varied. However guided the ends from bobbins *b b b* (which it is required to group) are collected and passed through or between guide-eyes, fingers or wires, such as *h'* carried on a traverse bar *h* which is caused to trav-



erse to and fro while the machine is at work so as to traverse and lay the doubled ends in sections or batches in the form of cheeses on the collecting or batching bobbin B. The bobbin B receives and collects the doubled ends, and, when filled, is taken to and serves as the feed bobbin for the new elongating or drafting machine. It follows that provision is made in the doubling machine to receive such a bobbin and also means provided for driving the bobbin to take up and wind the ends doubled or brought together by the machine. In the drawing the trunnions B' of the bobbin B rest on inclined sides B<sup>2</sup> and the bobbin is driven by a drum bearing thereon and rotated. This drum B<sup>3</sup> may be driven from the main shaft *i* through gear wheels *j k*, and provision may be made to introduce change wheels for speed variation purposes.

The traverse bar *h* shown has a number of curved wires *h'*, or fingers, and is shifted to and fro by a traverse motion of which many kinds are suitable. An example of a convenient motion would be to have the bar *h* slidable in bearings and to act on an arm *h*<sup>2</sup> pendent therefrom by a pin *m'* engaging a long slot in such arm, such pin *m'* being attached to the back of a bevel wheel *m* with which gears another bevel wheel *n* compounded with or mounted on the same shaft or axle as the spur wheel *k*. Instead of this, an eccentric or cam may be used, or any known traverse motion. If desired a guide bar or other guiding means may be attached to the traverse bar and move therewith.

We may fit any known or convenient stop-motion to stop the machine when an end breaks and we have shown one form of stop-motion in the drawings. According to this plan the several ends for each cheese pass over the curved or shaped ends of levers or pedals *o* pivoted at *o'* in brackets attached to the cross-bar *p* and such levers are loaded by droppers *o*<sup>2</sup>. So long as the yarn bears on its respective lever or pedal the dropper is held clear of the blades of a rotating bar *q* (of star wheel shape in cross section) and the ends are wound on. When however an end breaks, the particular dropper *o*<sup>2</sup> falls and arrests the rotating bar *q* which carries an attached cam *q'*, the arrestation of which forces the pinion *q*<sup>2</sup> endwise and causes it to displace the lever *r* mounted on the shaft *r'* the pinion *q*<sup>2</sup> being constantly driven by pinions *d*<sup>2</sup> *d*<sup>3</sup> from the top drum shaft. The shaft *r'* is supported in bearings and has a lever *s* secured to its opposite extremity, which lever bears below the release bar or rod *t* connected to the strap fork *u*. When the lever *r* is displaced, it rocks the lever *s* and lifts rod *t*, so that a notch therein escapes from its hold on the framing or elsewhere (see Fig. 4), and a spring *t'* pulls the rod *t*, which, by the strap-fork, shifts the

strap from the fast pulley *v* to the loose pulley *v'*. The strap-fork lever is marked *w* and is pivoted at *w'*, and this lever *w* may be directly actuated to shift the strap or through the longitudinal set-on rod *w*<sup>2</sup> which is provided to allow the operative to shift the strap without leaving her position at the front of the machine. The connection between the strap-fork *u* and the strap-fork lever *w* is such that the machines can be stopped by the attendant without the stop-motion mechanism being released.

By our apparatus the material from a series of bobbins from condenser cards can be quickly grouped, and the requisite number of ends collected, and passed at the required point through the traverse bar or guiding means which lays the doubled ends on the bobbin to receive the same, which latter, when filled, is taken away to the new elongating or drafting machine and the doubled ends fed direct into such machine.

The doubling apparatus may be designed to accommodate more than one bobbin for filling, and have corresponding parts to deal with such additional bobbins, such details being mere variation in the capacity of the machine.

The apparatus above indicated is exceedingly simple for the purpose. Its details may be varied considerably while yet producing substantially the same machines and so long as it is for the purpose related we regard same as within the scope of our invention.

The bracket arms *b*<sup>4</sup> *b*<sup>4</sup> *b*<sup>4</sup> and B<sup>4</sup> are for supporting spare bobbins by their trunnions, or for supporting bobbins while the material thereon is being "readied" by the attendant.

We declare that what we claim is.

1. An apparatus for doubling the ends of material from condenser cards and batching the doubled ends in sections comprising a frame, bobbin supports thereon, means for driving the bobbins, a take-up bobbin for receiving the materials from the bobbins, intermediate guide rods for the material, pedal drop bars, one for each thread, a rotating cam shaft arrested by said drop bars, and means operated by said cam shaft for stopping the apparatus.

2. A doubling apparatus for the indicated purpose, having bobbin supports, bobbin driving means, pedal drop bars with pendent droppers, a rotating cam shaft arrested by said droppers, strap shifting means, operated by said cam shaft, a traversing bar with guides, traversing gear, a section batching bobbin taking-up the doubled ends, and means for supporting said bobbin, substantially as set forth.

3. A doubling apparatus for the indicated purpose having bobbin supports, bobbin driving means, guide bars for the material, pedal drop bars for the doubled ends to be



grouped, droppers on said bars, a rotating cam shaft, a fixed cam thereon, and an end-wise movable cam, a disengaging lever acted on by the movable cam and a belt shifting  
5 bar acted on by the disengaging lever, a traversing guide bar, and a bobbin for batching the material in sections, as set forth.

4. A doubling apparatus for the indicated purpose, with bobbin supports, and driving  
10 means for said bobbins, and with guide bars intermediate of same with a stop motion, said stop motion comprising grouped drop levers, droppers, a cam shaft, with fixed and loose cams, and a disengaging lever, and

movable belt shifting bar, said machine having a traversing bar between the drop levers and a section batching bobbin, and means for driving said traversing bar and the section batching bobbin, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM HENRY HOYLE.  
THOMAS BARKER.

Witnesses:

RICHARD IBBERSON,  
ALFRED YATES.