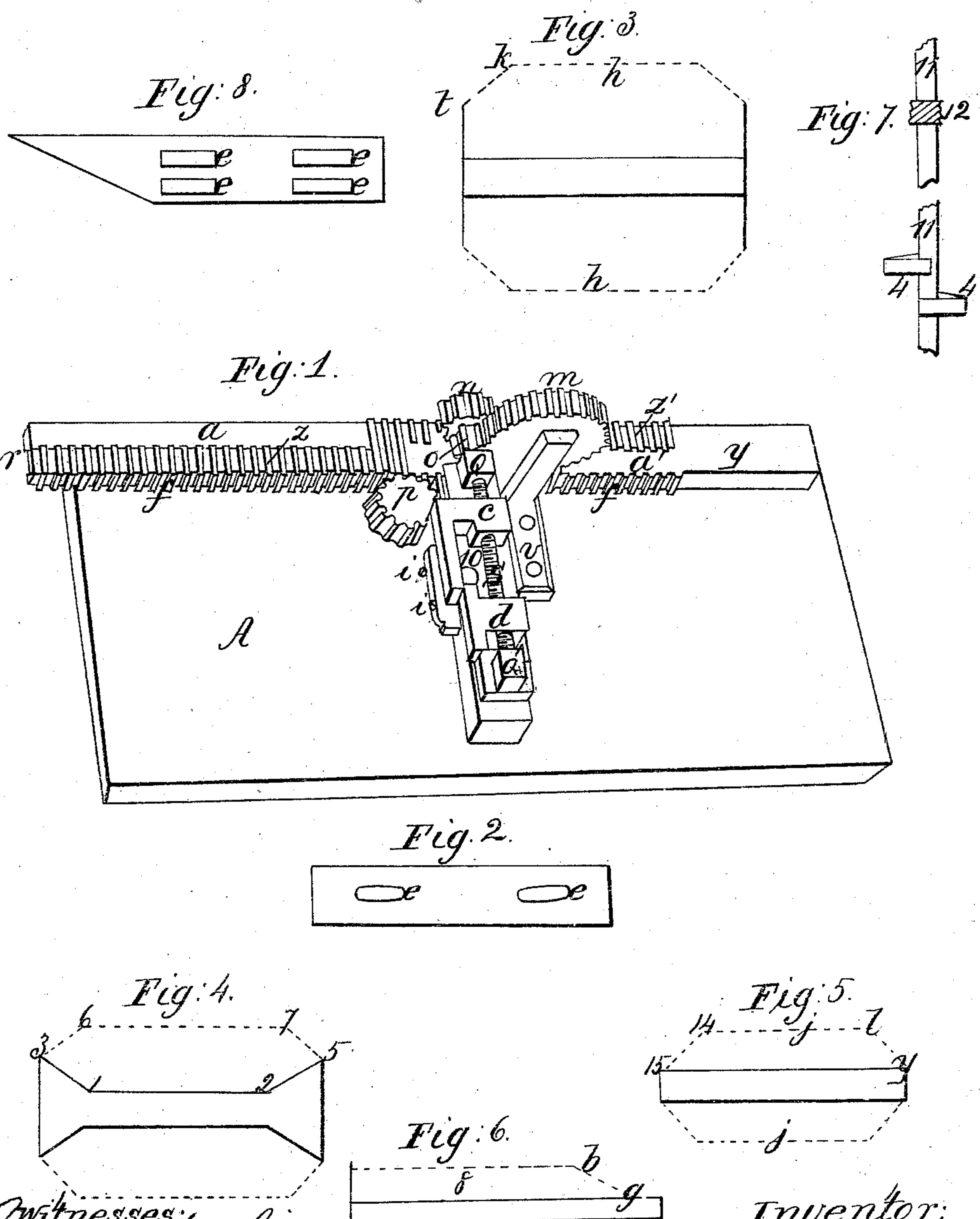


S. Goodwin. Spinning Mach.

N^o 43,367.

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Witnesses:
Charles A. Swanwick
John A. Emery

Inventor;
Simon Goodwin

UNITED STATES PATENT OFFICE.

SIMEON GOODWIN, OF BIDDEFORD, MAINE, ASSIGNOR TO CHARLES A. SHAW, OF SAME PLACE.

IMPROVEMENT IN MECHANISM FOR FILLING OR BUILDING BOBBINS IN SPINNING.

Specification forming part of Letters Patent No. 43,367, dated June 28, 1861.

To all whom it may concern:

Be it known that I, SIMEON GOODWIN, of Biddeford, in the county of York and State of Maine, have invented a new and useful improvement in that part of the mechanism of a fly-frame or roving-frame used in the manufacture of cotton which controls or regulates the movements of the bobbin-rails in such a frame; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, of which—

Figure 1 is a perspective view of one modification or style of my improved bobbin-builder. Figs. 2 and 8 are views of the adjustable auxiliary piece used to build the style of bobbin shown in Fig. 6. Fig. 3 is a view of an "Emery Bobbin." Fig. 4 is a view of a "Hussey Bobbin." Fig. 5 is a view of a straight-cylinder bobbin. Fig. 6 is a view of a "Goodwin Bobbin." Fig. 7 is a sectional view of the vertical rotating escapement-shaft.

Corresponding letters of reference indicate corresponding parts.

The mechanism for producing or regulating the movements of the bobbin-rails in a fly or roving frame is usually denominated a "builder," as it controls or regulates the building up or filling the bobbins.

The construction and operation of the builder in most common use in such frames is so well known and understood by all practical manufacturers of cotton that a very particular description of such is deemed unnecessary. Their general principles will, however, be understood by the following description and reference to Figs. 1 and 7, it being also understood that the common builder as now used is being described, and not my improvement. A rack having teeth the whole length on its lower edge, *f f*, and also teeth, *z z'*, the whole length on its front or face, and without any blanks, *a a'*, as shown in Fig. 1, is arranged to move on a slide, *y*, which is attached permanently to the frame-work of the fly-frame. A right and left hand screw, *s*, is arranged vertically in front of and below the rack, passing through the stud *Q* and standing in the step *Q'*, both of which are attached to the plate or stand 10, as shown. On this screw are placed two nuts or dogs, *c d*, one being on the right and the other on the left hand screw, so that when the

screw is turned to the right or left the nuts will approach or recede from each other, as the case may be. The upper end of the screw above the stud *Q* has no threads, but is elongated and made square, and passes so loosely through a gear or pinion, *n*, which engages the rack-teeth, that it can be easily moved back and forth longitudinally through or in the gear, but the gear cannot rotate without also turning the screw. In such a builder the gear or pinion *n* extends nearly across the face of the rack, and the pinions or gears *o* and *m* are not used. The plate 10, to which the stud *Q* and step *Q'* are attached, is so connected with the bobbin-rail of the frame as to rise and fall with it, the square end of the screw above the stud *Q* drawing down through or passing up through the gear *n* as the rail rises and falls, the gear being held in position on or over the face of the rack by a guide or stay. (Not shown.) A gear, *p*, also intersects or engages the teeth *f f* on the lower edge of the rack, and on the opposite end of the shaft on which the gear *p* is mounted is a wheel or crank, by means of which the frame or builder is "wound up," when the frame is "doffed," or the filled bobbins are taken off preparatory to filling a set of new ones.

In front of the gear *p* is arranged a vertical escapement or pallet shaft, Fig. 7, which has a worm-gear, 12, which intersects with the gear *p*, or a gear on the same shaft with that gear. This vertical shaft has two pallets, 4 4', which are alternately, by well-known devices, brought into contact with the nuts *c d* on the screw *s*. This vertical shaft, the square on the screw, and the guide or stay for holding the gear *n*, are not shown in operative connection in the drawings, all of the same being so well known and understood as a part of all such builders that they are unnecessary, this description being given merely in order that my improvement may be the better understood. Sufficient, however, is shown in my drawings, with the description thereof, to fully illustrate my invention.

Having thus described a common builder, its operation to build or fill the bobbin, shown in Fig. 5, is as follows: It being understood, as before stated, that the rack in such a builder has no blanks, *a a'*, Fig. 1; that the gears *o* and *m* are not used; that the gear *n* extends

nearly across the face of the rack and is held over the rack by proper guides or stays; that the plate 10 is attached to the spindle-rail so as to rise and fall with it; that the screw s at its upper end is squared and extends through the gear n , as described, and that the gear p , or its shaft, is put in connection with the worm gear 12 on the vertical escapement-shaft, one of the pallets 4 4' being against one of the nuts or dogs $c d$. The parts being in the above-described position the builder is wound up by the crank or wheel on the shaft, on which the gear p is arranged, running the rack back until the end r is brought over the said gear. This movement of the rack operates the gear n , and through it the screw s , to separate the nuts to the greatest distance. Now, when the frame is started up a reciprocating vertical motion is communicated to the bobbin-rail, and, consequently, to the plate 10, which is attached to and rises and falls with it. We will now, for instance, suppose that the pallet 4' of the escapement-shaft, Fig. 7, is pressing against the nut or dog d , Fig. 1, and that the bobbin-rail is rising, and consequently carrying up with it the plate 10, screw s , and nuts c and d . Now, when the nut d has risen high enough to let the pallet 4' pass or "escape" by the lower end of the said nut, the vertical shaft 11, Fig. 7, will be partially rotated on its axis by mechanism in connection with it designed for that purpose, so that the other pallet, 4, on the said shaft will be brought against the other nut, c , on the screw s , Fig. 1. This partial rotation of the shaft operates a "shipper," connected therewith, by which the motion of the bobbin-rails is changed and it commences to fall, continuing to pass down until the pallet 4, pressing against the nut c , can pass or escape by the upper end of said nut, when the shaft will be again partially rotated in the same direction and the pallet 4' brought against the nut d again. This rotation of the escapement-shaft, as described, also operates through the worm-gear 12, gear p , rack and gear n , to turn the screw s' , so that each time the shaft is partially rotated the nuts $c d$ will be moved nearer to each other, or so that the bobbin-rails will not have to rise or fall quite so far at each successive winding of a layer of yarn onto the bobbins as they did for the preceding layers—that is to say, by the nuts $c d$ being brought nearer to each other every time a pallet escapes past one of them, and the motion of the rails being consequently reversed a little sooner at each succeeding rotation of the shaft, the layers of yarn on the bobbins will be made shorter each time the motion is changed, thus building up the bobbins in the pyramidal shape shown by the lines $j j$, Fig. 5, the longest layer being between the points y and 15, or next the body of the bobbin, and the shortest layer between the points l and 14, or on the outside of the bobbin.

My invention consists in so modifying, altering, and adding to a builder, as above de-

scribed, that it will be adapted to building or filling bobbins, as shown in Figs. 4, 3, and 6, and it will be understood by the following description:

Roving bobbins with the ends more or less conical, as shown in Fig. 4, have been in use for many years, but have latterly taken the name of "Hussey Bobbins," by which I will also designate them. It will be seen that to fill such a bobbin a short layer of roving must be put on next the body of the bobbin from 1 to 2, the layers gradually increasing in length to the points 3 and 5, from which they decrease to the points 6 and 7. To build or fill a bobbin of this description I cut out the rack, as shown in Fig. 1, leaving the blanks $a a'$ and teeth $z z'$, and instead of constructing the pinion n so as to pass across the face of the rack entirely, I make it half the width of the rack and attach a smaller or intermediate gear, o , to it, as shown, and which does not come into contact with or engage the teeth of the rack. I also use a large gear, m , which is disposed on the stud v , and engages or intersects both the rack and the gear o , but it only engages the teeth z of the rack. The operation of this mechanism is as follows: When the builder is wound up and the rack is being run over so that the end r may come nearly over the gear p , the gear n will pass along the blank a , but the gear m will be brought into contact with the teeth z on the rack, and through the gear o will operate to turn the screw s and bring the dogs c and d to the center, between the stud Q and step Q' , or nearly or quite into contact, the gear o passing over the teeth z and the gear n passing along the blank a while this is being effected. It will now be seen that when the frame is started up that the first layer of roving on the bobbin will be shorter than the next succeeding ones, for as the mechanism operates and the rack begins to run back, or the frame begins to "run down," the nuts $c d$ will be separated by the action of the teeth z on the gear m , so that the time for each successive escapement of the pallets past the nuts will be increased as the rack runs back, owing to the nuts being separated or farther apart at each successive escapement than they were at the preceding escapement. This gradual increase in the length of each succeeding layer of roving is continued from the first layer until the bobbin is filled to the points 3 and 5, and the rack has been run back so far as to bring the pinion n into contact with the rack-teeth z' and the gear m over the blank a' , as shown, when the movements of the screw s will be reversed and the nuts $c d$, instead of receding, will approach each other, making each successive layer of roving shorter than the preceding one until the bobbin is built up to the points 6, 7, or is filled.

The bobbin shown in Fig. 3 is a roving bobbin with straight heads, and is known as the "Emery Bobbin," and presents many advantages over any other style known to me,

as it will when filled as shown, contain a larger amount of roving than any other.

The modification of my builder required to fill such a bobbin is as follows: I remove the gear *m* and arrange the nuts *c d* and screw *s*, so that when the frame is wound up and the end of the rack *r* is nearly over the gear *p*, the said nuts shall be at a proper distance apart to make the first layer of roving the same length of the body of the bobbin. It will be seen that after the gear *m* is removed, the frame wound up, and the rack run over, as described, that the pinion *n* will be over the blank *a*, and that the frame can continue to operate or run down until the rack is run back so that the said pinion engages the rack-teeth *z'*, when the screw *s* will be operated to cause the nuts *c d* to approach each other, and the layers of roving will, consequently, be shortened, as before described, until the bobbin is filled. The relative proportion of blank space *a* and teeth *z'* on a rack for filling such a bobbin must be graduated according to the length of the bobbin and the distance it is desirable to build up the same from the point *t* to *k*.

Fig. 6 represents a roving bobbin with but one head, which I denominate the "Goodwin Bobbin." It will not contain so much roving as the Emery Bobbin, but it presents advantages over the bobbin shown in Fig. 5. To build or fill such a bobbin in the style shown, I make use of the auxiliary piece such as shown in Fig. 8 or in Fig. 2, which I attach to the plate 10, Fig. 1, by the screws *i i*. This piece is made adjustable by the slots *e e*, and is fastened to the plate in such a position that one of the escapement-pallets will rest upon it instead of upon the nut *d*; but the other pallet, as the escapement-shaft rotates, will come against the nut *c*. I then remove the gear *m* and use a rack having no blanks *a a'*, the screw *s* and nuts *c d* being so arranged as to be at their greatest distance apart when the frame is wound up, the same as described for filling the bobbin shown in Fig. 5.

It will be seen that when the builder is so arranged that the pallet in contact with the piece described will always have to escape over the end of the said piece, instead of over the nut *d*, so that the bobbin rails will always have to rise to the same distance each time for that pallet to escape, thus building up the bobbin straight at one end or next the head, while on the other hand the nut *c* will be approaching the nut *d*, and will let its pallet escape a little sooner each time, thus building up the other end of the bobbin, as shown in Fig. 6 from *g* to *b*, the filled bobbin being represented by the lines 8 and 9. It is, of course, to be understood that in my improved builder, as described, the plate 10 is attached to the bobbin-rail and rises and falls with it; that the upper end of the screw is elongated and squared, passing through the gear *n*, as de-

scribed, and that the said gear is kept in place by any proper stay or guide.

I have not in the drawings shown the plate 10 as attached to the bobbin-rail, or the screw *s* as elongated and squared at its upper end, but have attached or mounted the said plate on the bed-piece A and fastened the gears *n o* firmly on the screw for the reasons before stated, these omissions not affecting the illustration of my invention.

It is to be understood that the rack in the various modifications described is connected as usual in such frames with mechanism which controls the speed of the bobbins or fliers, or both.

The modification of my invention by which a frame known as a "Brown's Speeder," and frames of that character, are adapted by the use of my invention to filling the Emery bobbin, is as follows: In such frames a spur-wheel corresponding in its function to the gear *p* in the drawings operates in connection with a straight rack substantially in the manner hereinbefore described for a common builder. To this spur-wheel, on the same shaft, or so as to operate in conjunction therewith, I attach a wheel or circular rack, constructed so far as it relates to the blank and teeth on said rack substantially the same as the rack for filling the same bobbin, and which is hereinbefore described, the relative amount of blank space and teeth on the circular rack being made to correspond with the size of the bobbin-heads and the degree it is required to fill them or build them up above the heads, the same as on the straight rack. To this circular rack, or so as to engage therewith, I connect a gear and shaft, through which an escapement mechanism to change the motion of the rail is operated as before described. This circular rack is so adjusted in relation to the spur-wheel and its connections that when the frame is wound up prior to filling a new set of bobbins the gear which engages the circular rack is brought over the blank space in said rack, so that when the frame is started up it will continue to run down until the bobbins are filled to the top or outside of the heads before the teeth on the rack engage the gear and operate through it by means of the escapement mechanism to produce a differential traverse in filling the bobbin above or outside of the heads, substantially as shown and described. A straight rack with a blank and teeth in proper proportions could be used in such a frame in conjunction with the usual rack to accomplish the same purpose, and various other modifications will readily suggest themselves to the practical mechanic or manufacturer which embody the general principles of my invention. A frame of this kind can also be readily arranged to build or fill the Hussey bobbin by alterations of and additions to the rack, substantially as shown in Fig. 1, and by the use of an escapement mechanism therewith.

Having thus described my improved mechanism for building or filling bobbins of the various kinds shown, what is new and of my invention is—

1. A mechanism for building or filling the Hussey bobbin, in the manner shown in Fig. 4 and as herein described, when constructed and used substantially as set forth and specified.

2. A mechanism for building or filling the Emery bobbin, in the manner shown in Fig.

3 and as herein described, when constructed and used substantially as herein specified.

3. The adjustable auxiliary piece for building or filling the Goodwin bobbin, in the manner shown in Fig. 6 and herein described, when constructed and used substantially as hereinbefore set forth.

SIMEON GOODWIN.

Witnesses:

CHARLES A. SHAW,
JOHN A. EMERY.