2 Sheets—Sheet 1.

A. P, ADAMS.

COP-BUILDING MECHANISM FOR SPINNING-MACHINES.

No. 195,470. Patented Sept. 25, 1877.

Fig. 1.

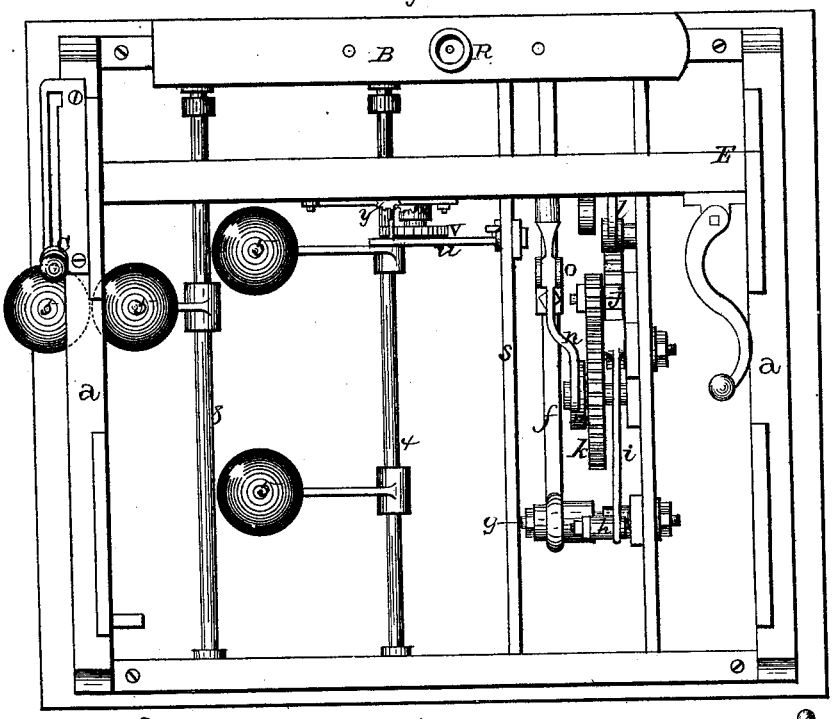
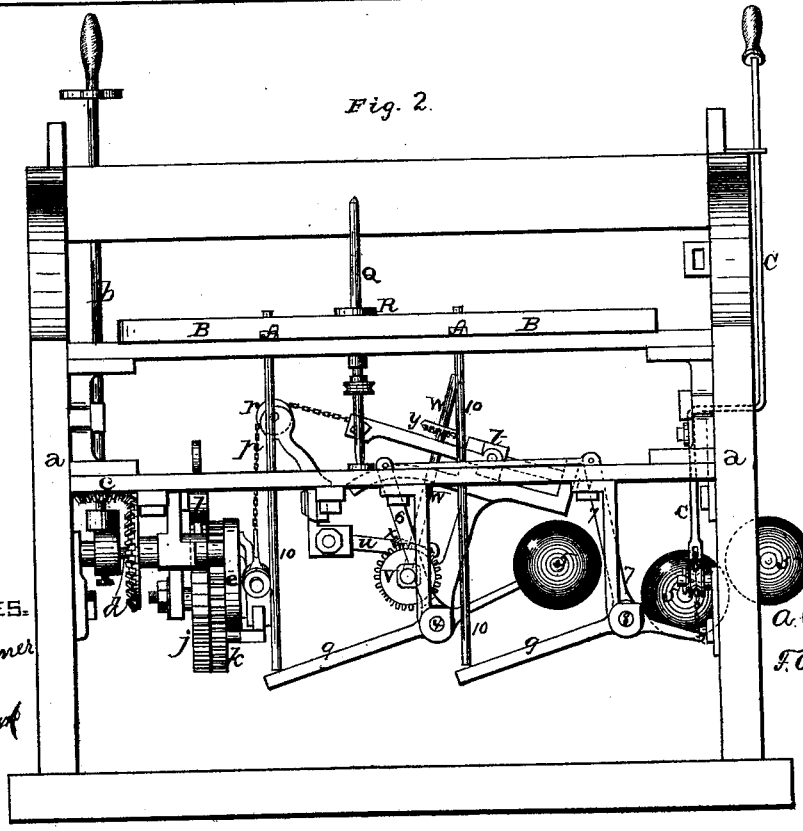


Fig. 2.



WITNESSES.

J. Wm. Garner

Albert J. de Goyler

INVENTOR

A. P. Adams

per

F. A. Lehmann

atty.

2 Sheets—Sheet 2.

A. P. ADAMS.

COP-BUILDING MECHANISM FOR SPINNING-MACHINES.

No. 195,470. Patented Sept. 25, 1877.

Fig. 3

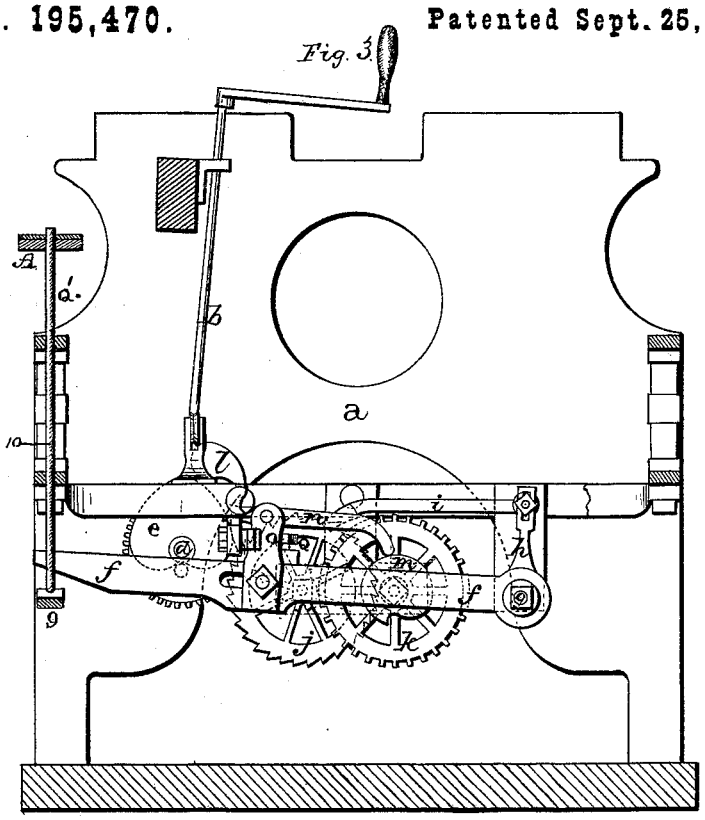
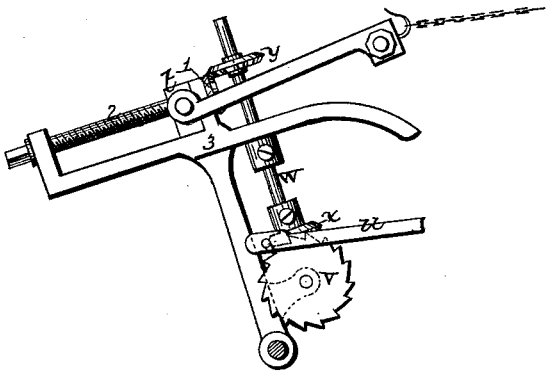


Fig. 4.

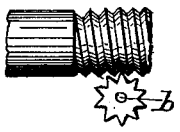


WITNESSES.

J. Wm. Garner.

Albert J. de Zoya.

Fig. 5



INVENTOR.

A. P. Adams

per

F. A. Lehmann

atty.

UNITED STATES PATENT OFFICE.

AMASA P. ADAMS, OF WEST WARREN, MASSACHUSETTS.

IMPROVEMENT IN COP-BUILDING MECHANISMS FOR SPINNING-MACHINES.

Specification forming part of Letters Patent No. **195,470**, dated September 25, 1877; application filed March 27, 1877.

To all whom it may concern:

Be it known that I, AMASA P. ADAMS, of West Warren, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Spinning-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in cop-building mechanism for spinning-machines that is adapted to all ring-spinning frames, whether used for warp or filling; and it consists in the arrangement and combination of parts, that will be more fully described hereinafter, whereby, first, an attachment is arranged for the purpose of shaping the cop while the bottom is being built, thus causing the cop to build out to its proper diameter, whereby it is made to take on more yarn than could be done without the use of a shaper; second, the combination of parts, whereby the cop is kept the same diameter from shoulder to shoulder while being built; third, the change pinion-wheel, whereby it is adapted to all sizes or numbers of yarn; fourth, in the application of a building motion to the quadrant, for the purpose of building up the cop the same diameter from shoulder to shoulder, combined with a change pinion-wheel for adapting it to all numbers of yarn.

The accompanying drawings represent my invention.

a represents an ordinary iron frame of any desired construction or form. *b* is a vertical shaft, that is driven by the worm-gear on the front roll, (shown in Fig. 5,) and which has a bevel-gear, *c*, secured to its lower end for meshing with the bevel-gear on the shaft *d*. On the inner end of this shaft *d* is secured the heart-shaped cam *e*, which bears down upon a stud or projection from the side of the lever *f* for the purpose of depressing the lever at every revolution. This lever is pivoted at its rear end upon a journal, *g*, that can be adjusted up and down in the slotted hanger in which it is held. Formed with, or attached to, the journal of the pivoted lever *f* is the arm *h*, which is slotted at its upper end; and in this slot is secured the long pawl *i*, which moves the ratchet-wheel *j* forward one tooth every time the free end of the lever *f* is depressed. The wheel *j* is placed upon a journal that can be adjusted back and forth in a slot in which it is held, and which wheel has a small pinion secured to its side for meshing with the spur-wheel *k*. Pivoted above the wheel *j* is a dog, *l*, which prevents any back motion in the wheel, from any cause whatsoever. Upon the same shaft as the wheel *k*, and turning with it, is the cam *m*, upon which bears the long end of the lever *n*, which is journaled in the bearings *o*, which are adjustably secured to the lever *f*, which is slotted for that purpose. The journal of the wheel *k* can be adjusted back and forth similar to the one upon which the wheel *j* is placed. In the bearings *o* is placed a set-screw, Q, by means of which the play of the lever *n* can be nicely adjusted. To the short end of lever *n* is attached the chain *p*, which chain connects it with the builder-nut.

As the heart revolves from heel to point the ratchet is carried forward, thereby turning the cam *m*, whereby the long curved end of the lever *n* is raised and the short end depressed one one-hundredth part of an inch at each revolution of the cam *e*. This, added to the traverse which the heart gives to the lever *f*, which is one inch, make one and one one-hundredth inch traverse.

The chain *p* passes up over the pulley *r*, that is placed upon an upright attached to the cross-bar *s*, and has its other end attached to the builder-nut *t*, so that each time the lever *f* is depressed the nut will be drawn forward. Depending from the bar *s* is a slotted bearing, in which is clamped a pivot-rod, and upon this rod is placed the pawl *u*, which catches in the teeth of the ratchet-wheel V. Upon the other end of the shaft on which is the ratchet-wheel V is a bevel-gear, which meshes with the pinion *x*, placed on the lower end of the shaft W. Near the upper end of this shaft is secured a bevel-wheel, *y*, which meshes with the pinion 1 on the front end of the screw 2, which moves the nut back and forth.

All of the mechanism above described from the ratchet-wheel V is placed upon a frame, 3, which is fastened to the partially-revolving

weighted shaft 4. Every time the lever *f* is depressed the chain draws the building-nut and quadrant *t* forward, and then, as the lever rises, the counterweights 5 draw the nut and quadrant back to position again. As the nut is drawn backward again the pawl, which remains stationary, catches behind one of the teeth of the ratchet V, and pulls it slightly around, and thereby operates the other wheels, and gradually moves the nut forward on its screw. Extending upward from the shaft 4 is an arm, 6, which is connected to a similar arm, 7, that projects upward from a weighted rock-shaft, 8, that runs parallel with the shaft 4. From each of these shafts project the levers 9, upon which rest the uprights 10, which uprights have the nuts A secured near their upper ends, and upon these nuts is placed the ring-rail B. As the shafts 4 and 8 rock back and forth, the levers 9 alternately raise and lower the rail upon the spindles.

If desired, the uprights will be provided with flat ends, and the ends of the levers 9 be provided with friction-rollers, so as to make the parts move more easily.

Extending outward from the shaft 8 is an arm, which has its outer end connected, by means of a chain, with a lever, C. By pulling back on this lever the shaft 8 is raised upward, the building-nut and quadrant thrown forward, and the ring-rail depressed and held in this position. By means of this lever the rail can be moved down when the frame is in full motion, and thus the cops are in position, ready to be doffed upon stopping the machine, much better than can be done by hand.

A cop-tube is placed over the top of the spindle Q′, low enough down so that the traveler on the ring R will commence to wind the thread on the tube about one-fourth of an inch from its bottom when the curved end of the lever rests in the depression of the cam *m*. Now, as the heart revolves from point to heel, and thereby, through the mechanism already described, causes the ring-rail to move up and down the length of the traverse that the heart gives to the lever *f*, which is one inch, and at the same time that the ring-rail moves up the frame or quadrant 3 moves on a circle to the right, thereby causing the nut *t* to be worked back to the left, (see Fig. 2,) which will give more length to the chain *p*, and let the ring-rail up one one-hundredth of an inch farther than before. The heart gives the same length of traverse down that it did up, with the addition caused by the action and position of the lever *n*, and the peculiar shape of the cam *m*, which, for the sake of illustration, I call the two one-hundredths of an inch. This two one-hundredths added to the traverse of the lever *f* makes one and two one-hundredths inch. Thus, every time the ring-rail moves up the builder-nut builds, and every time the rail moves down the cam *m* works around enough to lengthen the traverse downward, which movement, in connection with the regular up-and-down motion of the rail, tends to give shape or form to the bottom of the cop. By thus lengthening the traverse downward, by the peculiar shape of the cam *m* and the position of the lever *n* on the lever *f*, the bottom of the cop is caused to take on the proper form, and build out to the right diameter; and this is attained when the cam *m* has worked about one-third of the way around from where it first started. The other two-thirds of the cam holds the body of the cop at the proper diameter until the full length is attained.

Having thus described my invention, I claim—

1. In a spinning-machine, the combination, with the ring-rail and mechanism for imparting to the same a reciprocating motion, of a builder-nut, an auxiliary cam, and mechanism, substantially as described, for operating the said builder-nut and for connecting the said cam to the rail, whereby, in the operation of the machine, the traverse of the rail is raised at each traverse thereof, and the form of the initial cone is regulated, as and for the purposes set forth.

2. The combination of the heart *e* and an intermediate operating mechanism between the heart *e* and cam *m*, substantially as described, with the two levers *f* and *n*, and a builder-nut, the parts being connected and arranged to operate as described.

3. In a cop-building mechanism, the combination of the lever *f*, heart *e*, arm *h*, pawl *i*, lever *n*, cam *m*, and intermediate mechanism, substantially as shown.

4. In a cop-building mechanism, the combination of the lever *f*, lever *n*, arranged on the top thereof, heart *e*, intermediate mechanism, substantially as described, cam *m*, chain *p*, and a building-nut, substantially as set forth.

5. The combination of the pawl *u*, ratchet V, shaft W, suitable connecting-wheels, screw 2, and building-nut *t*, substantially as described.

6. The combination of the weighted shaft or shafts, levers 9, uprights 10, and ring-rail B, with an arm and lever attached to the shaft, whereby the rail can be lowered when the frame is in full motion, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of March, 1877.

AMASA P. ADAMS.

Witnesses:
JOSEPH E. LOMBARD,
LEWIS ELWELL.