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H. SCHOCK & G. KELLER.

Spinning-Machine.

No. 223,865. Patented Jan. 27, 1880.

Fig. 3.

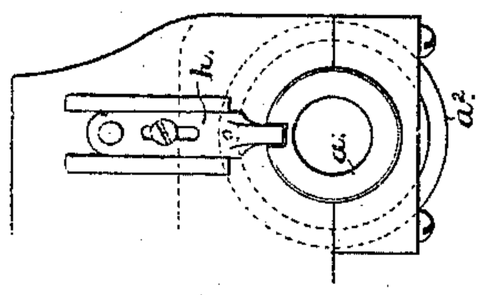

Fig. 3*.

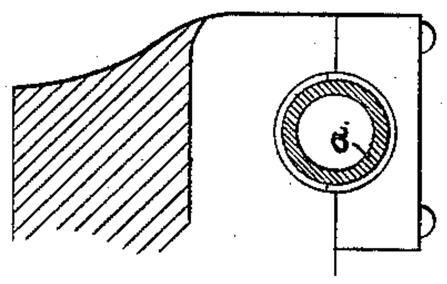

Fig. 2.

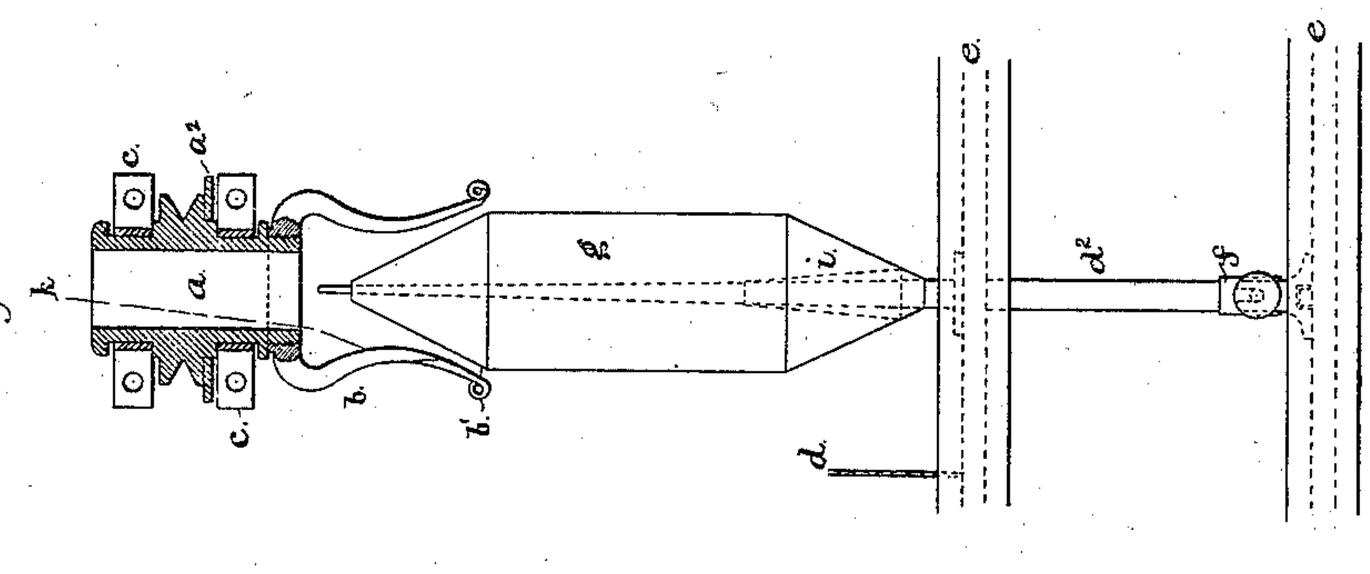

Fig. 1.

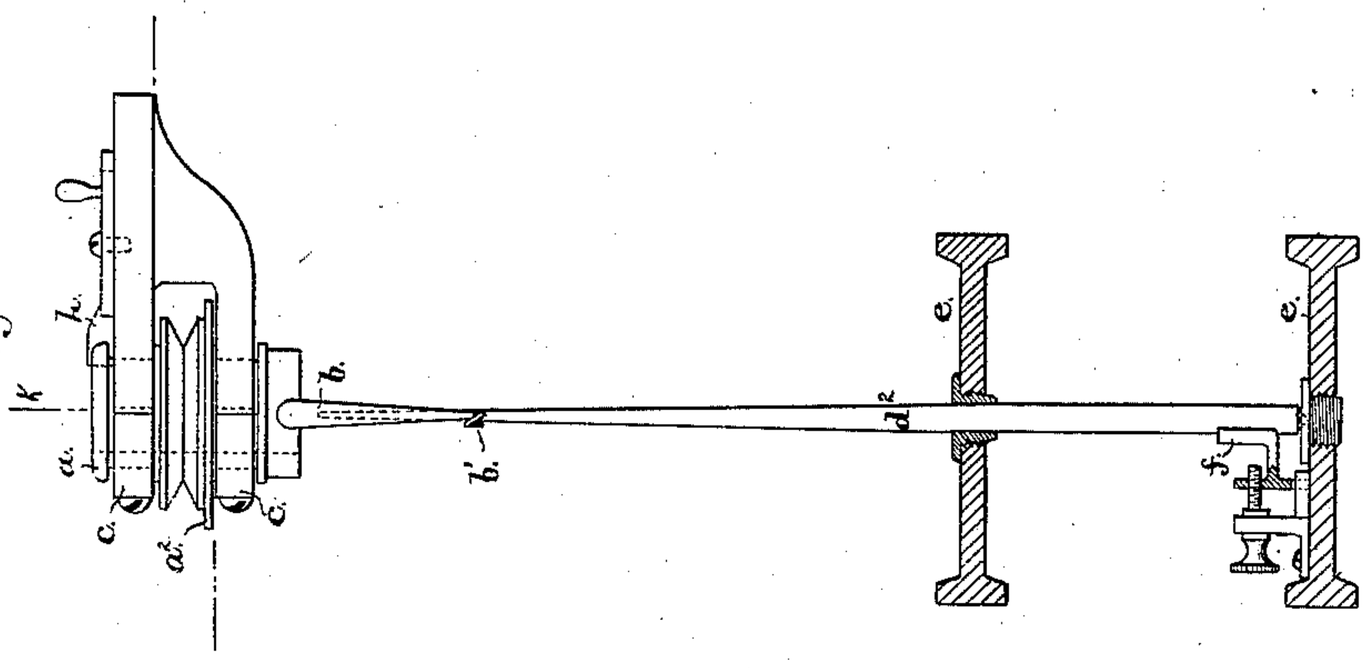

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Fig. 5.

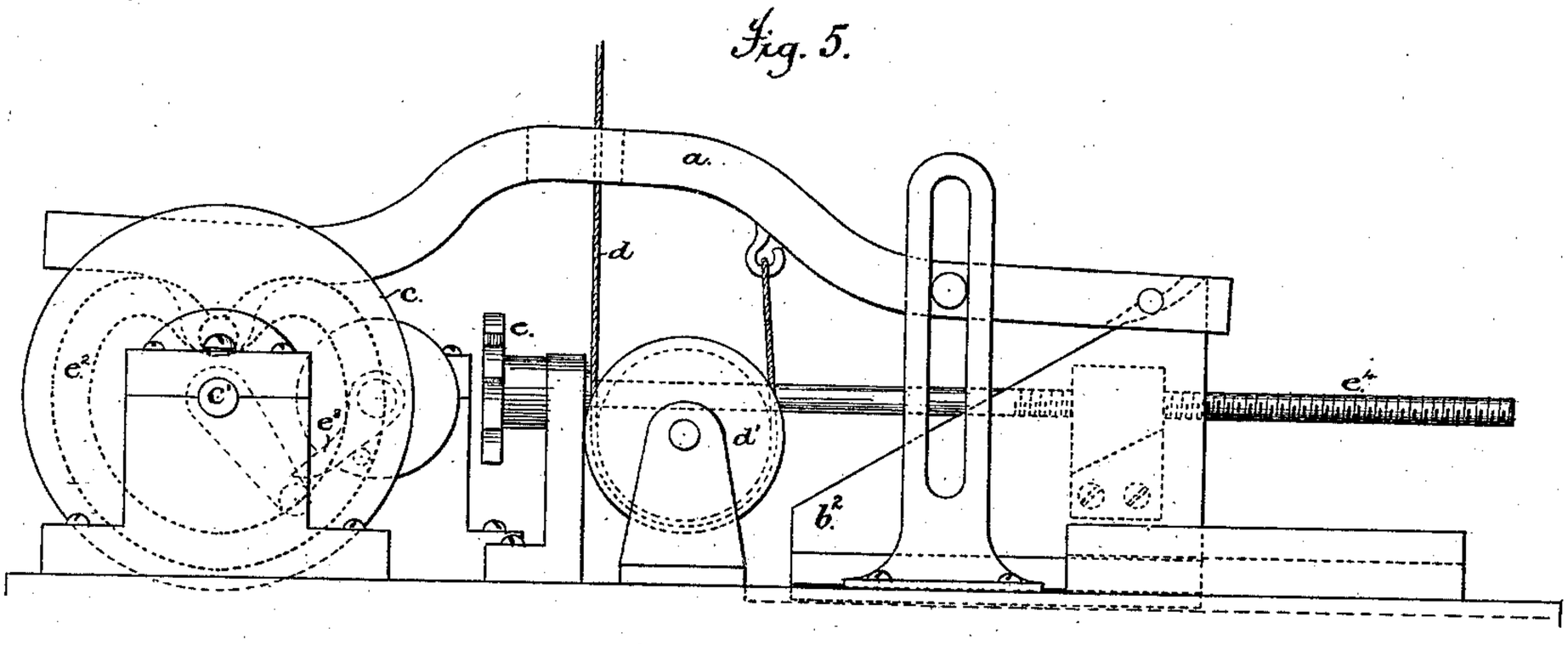
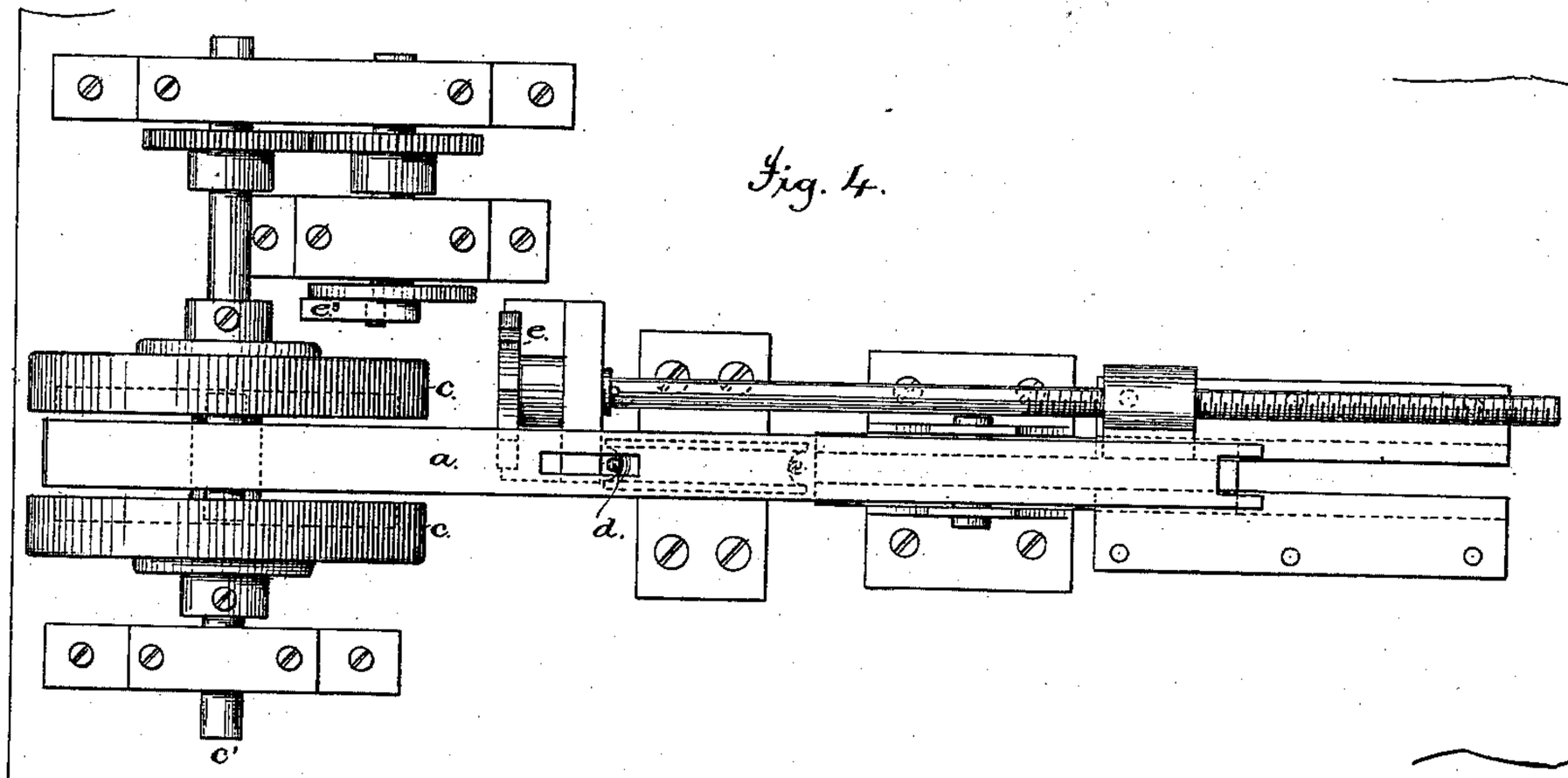


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY SCHOCK AND GOTTLIEB KELLER, OF ULSTER, SWITZERLAND.

SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 223,865, dated January 27, 1880.

Application filed December 18, 1878.

To all whom it may concern:

Be it known that we, HENRY SCHOCK and GOTTLIEB KELLER, both of Ulster, in the canton of Zurich, Switzerland, have invented certain new and useful Improvements in Spinning-Machines, of which the following specification, when taken in connection with the accompanying drawings, is declared to be such a full, clear, and exact description as will enable others skilled in the art to make and use the same.

In said drawings, Figure 1 is a sectional elevation, taken across the copping-rail. Fig. 2 is a side elevation of the parts shown in Fig. 1, the flier-head being in section. Fig. 3 is a plan view of the flier-head. Fig. 3× is a cross-sectional view of the same. Fig. 4 is a plan, and Fig. 5 a side elevation, of the apparatus for forming the bobbin and regulating the movements of the copping-rail.

This invention relates to that portion of the mechanism of spinning-machines which operates to wind the thread or yarn up in the form of a bobbin, said invention consisting, principally, in the combination of instrumentalities by which the copping-rail supporting the spindles may be automatically governed in its vertical reciprocations, whereby the flier is caused to properly guide the thread or yarn to the spindle or cop-tube supported thereon, and to lay the same in such manner thereon as to form a bobbin with a conical head at one or both ends.

The invention also embraces a stopping-bolt as constructed and combined with the flier.

The flier consists of guide-arms *b*, extending from a hollow head, *a*, which is provided exteriorly with suitable bearings, whereby it is journaled in a stationary frame, sections *c* of which being removable for this purpose. This head is also supplied with an external pulley, which receives the driving-band that causes its rotation. Beneath this pulley, and encircling its hub, is a friction-disk, a^2, which may rest loosely or be prevented from rotating by a pin securing it to the frame. This disk may thus be moved upward by hand, so as to act as a friction-brake upon the under side of the pulley, and thus slow down the movement of the flier.

The upper flange of the head *a* is notched, as is best seen in Fig. 3, to receive the end of a sliding bolt, *h*, that may be operated by hand to suspend the rotation of the flier, as will presently appear.

The copping-frame consists of rails *e*, as is common, which are provided with a bolster bearing and step for properly supporting the spindle d^2, the rotation of which is governed by means of a frictional brake, *f*, as will presently appear.

The thread or yarn *k*, as represented in Figs. 1 and 2, is supposed to be coming from the drawing-rolls of the spinning-machine. It is led down through the hollow flier-head *a*, and is wound around the flier-arm *b*, passed through the eye b' of said arm, and is fastened to the spindle or cop-tube, as is clearly shown. This thread or yarn is carried around the spindle and laid thereon as fast as the drawing-rolls will produce it by means of the flier when the same is set in motion.

In order to build up the thread as it is wound upon the spindle into proper shape—that is, with one or two conical heads—it is necessary that the spindle shall be alternately raised toward and lowered away from the flier, (whose arm always rotates in the same horizontal plane,) and this is accomplished by vertically reciprocating the copping-rail, the proper relative throw at each successive reciprocation of said copping-rail determining the shape of the bobbin—that is to say, forming it with one or both ends in conical form. The mechanism for thus reciprocating the copping-rail is illustrated in Figs. 4 and 5, and will now be particularly described.

On the shaft c' is fixed a heart-shaped cam, which, being rotated, vibrates the lever *a*, that is fulcrumed upon the inclined upper edge of a former, b^2. This cam is shown as a double cam, each member having a heart-shaped groove, e^2, in which run studs projecting from opposite sides of the lever. A single-face cam upon which the said lever rests would, of course, accomplish the same result.

A chain, *d*, attached to the lever *a*, runs under a fixed pulley, d', and, passing over another or similar pulleys, is suitably attached to the copping-rail *e*, to which it imparts a rising-and-falling motion with a greater or less speed, corresponding to the different radii of

the cam *c*. This operation, as is apparent, will cause the thread or yarn to be regularly laid upon the spindle to form the body of the bobbin. The form of the bobbin—that is to say, its conical end or ends—is produced by the variation in the extent of the throw of the lever, which is governed by changing the fulcrum at each throw of the lever *a*. This is accomplished by means of the inclined former b^2, which is automatically carried backward by a propelling-screw, e^4, that is partially rotated at each revolution of the cam *c* by means of a pawl, e^3, that is revolved in concert with said cam by means of gearing communicating with the driving-shaft of the cam, which pawl e^3 engages at each of its revolutions with one tooth of a ratchet-wheel, *e*, carried at the end of said propelling-screw. This change in the position of the fulcrum of the lever *a* causes its throw to gradually decrease, and consequently produces a like diminishing reciprocation of the copping-rail, whereby the layers of thread constituting the bobbin will be built one upon another, so as to produce a conical end.

The spindle may be of that class which is rotated slowly by the power derived from the operation of winding the thread or yarn upon it, or be driven slowly by the usual pulley and driving-band. In the present instance, as the rotation of the spindle is derived from the winding operation of the flier, it is obvious that its speed will vary considerably if not controlled. Thus at the beginning of the operation, when the bobbin is small, its velocity will be slight as compared with that imparted to it when the bobbin is large; and, as the thread or yarn is fed forward by the drawing-rolls at a regular speed, it follows that, in order to produce tight and even winding, the relative speed of the spindle must be controlled. This is accomplished by means of the friction-brake *f*, which is, by means of its driving-screw, caused to apply the requisite amount of friction to the spindle necessary to regulate its speed of rotation.

If in the winding operation the thread or yarn breaks, as is not unfrequently the case, the attendant may speedily arrest the rotation of the flier by pressing the friction-disk a^2 upward against the under side of the flier-pulley until that operation so far modifies its speed as to enable the sliding bolt *h* to be pressed into the notch in the flange of said pulley, whereupon the flier will be brought to a state of rest. The hands of the attendant are then free to enable him to recover the broken end of the thread and reattach it to the bobbin, when the flier may again be set in motion and the winding proceeded with. When the bobbin has attained the desired dimensions the copping-rail will be lowered far enough to permit the removal of the formed bobbin, and the described operation repeated.

Although but one spindle and its appurtenances have been described, it is, of course, to be understood that a number of spindles will be arranged in a series, as is common.

Having now described our improvements, what we claim is—

1. The combination of the vibrating lever *a*, the copping-rail, a chain, *d*, and suitable pulleys, an actuating-cam, e^2, and a fulcrum-supporting former, b^2, the screw e^4, a ratchet-wheel, *e*, a rotating actuating-pawl, e^3, and means for rotating said pawl and cam, substantially as described.

2. The combination, with the notched head *a* of the flier, of the sliding bolt *h*, whereby the rotative movements of the flier are suspended, substantially as described.

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

HENRY SCHOCK.
GOTTLIEB KELLER.

Witnesses:
WEIDMANN CASPAR,
JAKOB GALL.