

H. A. CHAPIN.

Electrical Stops for Spinning Machinery.

No. 138,993.

Patented May 20, 1873.

Fig. 1

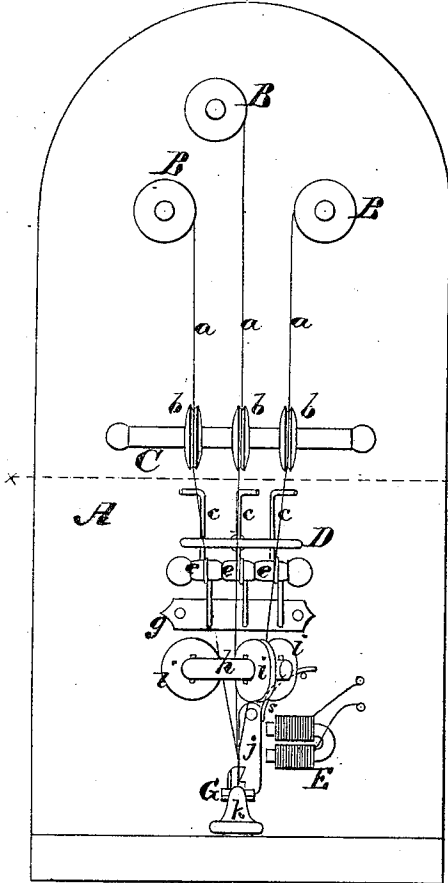


Fig. 2

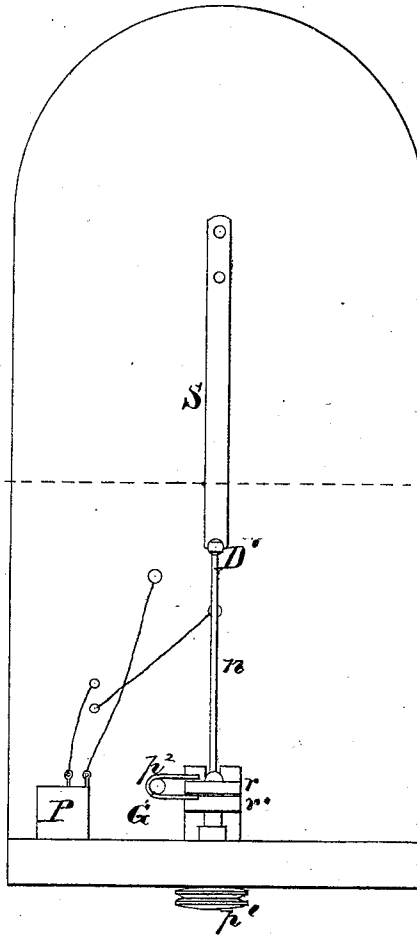
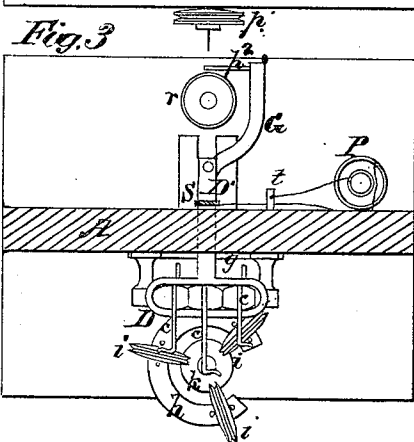


Fig. 3



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UNITED STATES PATENT OFFICE

HENRY A. CHAPIN, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN ELECTRICAL STOPS FOR SPINNING-MACHINERY.

Specification forming part of Letters Patent No. **138,993**, dated May 20, 1873; application filed December 31, 1872.

To all whom it may concern:

Be it known that I, HENRY A. CHAPIN, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented an Improved Electrical Stop-Motion of Spinning, Weaving, Knitting, and other Machinery; and I do hereby declare that the following is a full, clear and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1, Plate 1, is a front elevation, showing my stop-motion applied to a spinning-machine. Fig. 2 is a back view of the same. Fig. 3 is a section taken horizontally through Figs. 1 and 2, in the plane indicated by dotted lines *xx* thereon. Fig. 4, Plate 2, is a vertical section taken through the machine.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improved electrical stop-motion for spinning, weaving, knitting, and other machines, wherein it is desired to stop the same in the event of any one of the yarns breaking. My object is to employ an electrical circuit-opener which will leave the circuit open when the machine is in operation, and instantly reopen the circuit when the machine is stopped, thus enabling me to employ a battery of comparatively slight power, and, also, to obtain great economy in the electrical agents, as will be hereinafter explained.

The following description of my invention will enable others skilled in the art to understand it.

In the accompanying drawing, I have represented my invention applied to part of a spinning-machine, of which A represents the frame, and B B B three spools, from which three yarns *a a a* are carried through circular guides *b b b*, on a bar, C, and through similar guides *i i i*, on a circular bar, *h*, and thence through a tube, *k*, to a flier, which is not shown in the drawing. Between the guides *b* and *i* are arranged three fingers *c c c*, corresponding to the three yarns *a*. These fingers are secured to tubes *e*, which are applied loosely on a rod that is supported by posts. This allows the fingers to vibrate freely on their rod, and to bear by their curved

upper extremities against the yarns *a*, when these yarns are all unbroken. The upper arms of fingers *c* pass through an oblong yoke, D, which is fast on the end of a rod, D', that plays through the frame A and is acted on by a spring, S, which operates to quickly throw back the yoke when it is released. The rod D' is rigidly connected by a rod, *n*, to a shipper-lever, G, which extends forward through the frame A, and, when the machine is in operation, is held in place by a pawl or armature, *j*. The rear end of the lever G has a belt, *p*², on it, which will ship the driving-belt from the fast pulley *r* to the loose pulley *r'*, and vice versa. The pulleys *r r'* are applied on a shaft, which carries on its lower end a belt-pulley, *p*¹, around which a belt passes to a pulley, *p*, below the tube *k*. When the rear end of the lever G is allowed to drop down, it ships the driving-belt from the fast to the loose pulley and thus stops the spinning. The pawl or armature *j* is pivoted at its upper end to frame A, and acted on by a spring, *s*, which forces its lower notched end against the front arm of the lever G, so that when this arm is depressed to re-start the machine, it will be caught and arrested by the pawl *j*; and thus the driving-belt will be held upon the fast pulley *r*. E represents an electro-magnet, which communicates by circuit-wires with the N-pole and P-pole of a battery, P, and, also, with a plate, *g*, and with one of the posts *t* of the rod on which the fingers *c* vibrate.

Where there are a great number of the spinners employed in a single frame the battery-wires will be connected to similar parts, above described, of each spinner.

Operation.

When the front arm of the shipper-lever G is depressed, and the machine started, the yoke D will throw forward the hooked ends of the three fingers *c* against their respective yarns *a*, but the lower and shorter arms of these fingers will not touch the plate *g*; consequently the battery circuit will not be made, and there will be no undue waste of battery material. Should any one of the yarns *a* break, its finger *c*, which was above described as being electrically connected with the battery P, will impinge against the plate *g* and instantly

complete the circuit, causing the electro-magnet E to release the shipper-lever from the pawl or armature j, when spring S will depress the shipper p², stop the machine, and, at the same time, throw back the yoke D, thus reopening the circuit again, as indicated by the dotted lines in Fig. 4. When the broken yarn is mended, the front end of lever G is again depressed and the spinning allowed.

It will be seen that when a yarn breaks, the electrical circuit is instantly closed and opened again, and that the circuit is always open when the machine is in operation and when it has ceased to operate.

I am aware that the application of electrical action upon a magnet attached to machines for knitting, warping, weaving, spinning, &c., for the purpose of stopping them, is not new, (said action being produced by fingers suspended upon a shaft connected with one pole of the battery, and having one end supported by the yarn, and in case of breakage of the yarn, thereby letting the finger fall and form a connection with the other pole of the battery.) But in practice, where many machines are connected with one battery, it has been found that inconvenience, uncertain magnetic action, and unnecessary waste of battery-power has resulted from numerous simultaneous circuit connections, (the normal working condition of machines and electrical connections being upon an open circuit,) made by numerous breakages or derangements of yarns, or by the dropping of fingers from the yarns slacking up while the machines are at rest out of working-hours. Therefore, I have applied to my machines what I call a circuit-opener, which instantly lifts the fingers from the connections just formed, by

the movement of the shipper-rod or lever, which, in performing its function of stopping the machine, after being let go by the action of the battery upon the magnet caused by the fallen finger, by the same movement lifts the fingers from the connection just formed, leaving the electrical circuit open, as it was before the yarn broke. Thus the breaking of a yarn stops the machine and opens the circuit at the same instant. Also, the stopping of the machine at the close of working-hours causes the wire yoke surrounding the fingers to draw and hold them back so they cannot fall forward and form a connection on the circuit, until again permitted to fall forward into their place upon the yarns by moving the shipper-lever to start the machine. By means of this circuit-opener, a battery sufficiently powerful to work one magnet is found to be ample for any number of spindles or machines; and hence economy in the first outlay, and in the consumption of battery materials.

What I claim as new, and desire to secure by Letters Patent, is—

On machines for spinning or doubling and twisting, especially, and other descriptions of machines mentioned in the specification, the combination of a circuit-opener with, and operated by, the shipping-device, which, instantly that a thread breaks, pulls or pushes the latches or fingers off from their electrical connecting-points, thus reopening the circuit which had been closed by their falling, substantially as described.

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Witnesses:

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