

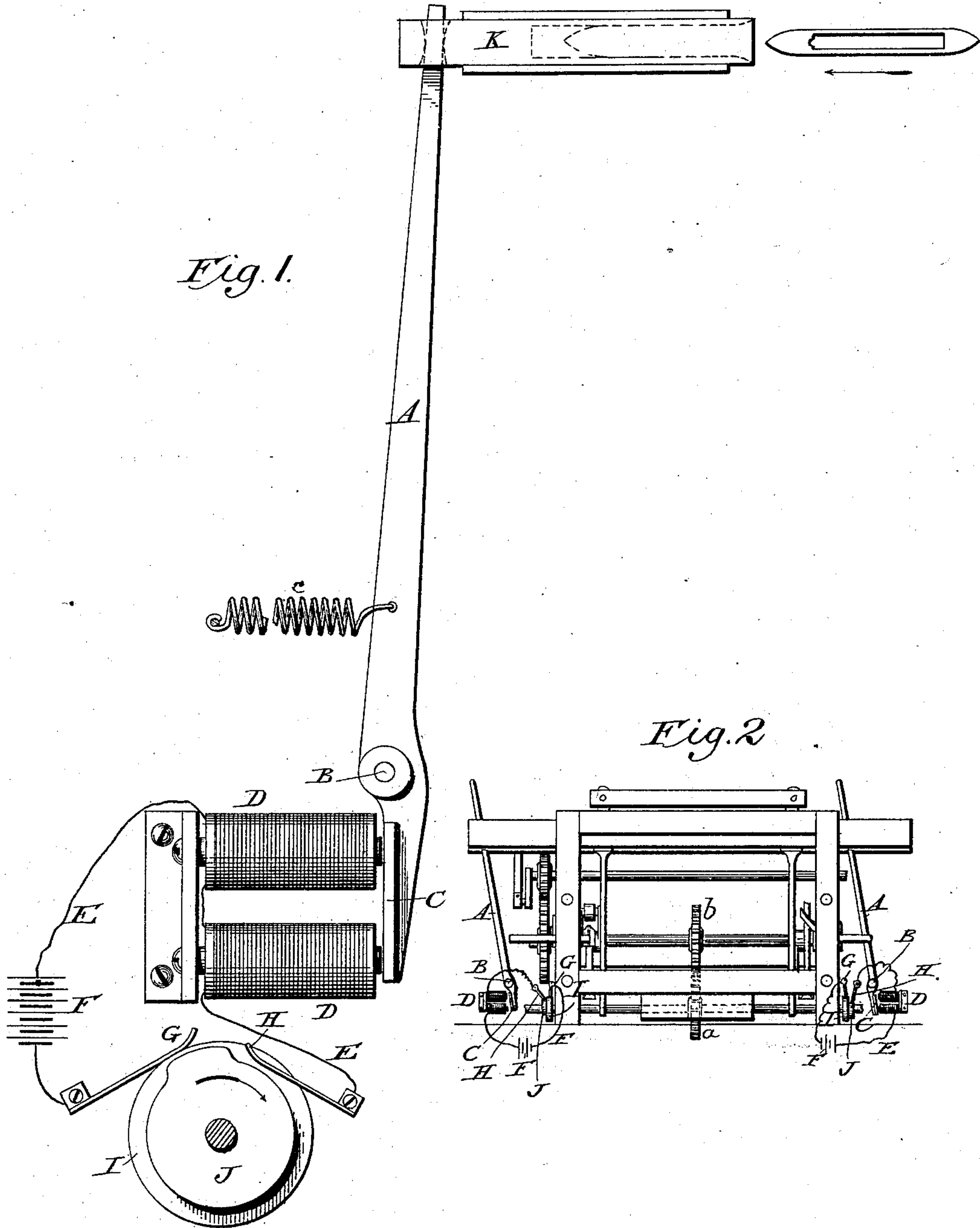
(No Model.)

E. S. WINCHESTER.

SHUTTLE OPERATING MECHANISM FOR LOOMS.

No. 310,970.

Patented Jan. 20, 1885.



Attest

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SHUTTLE-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 310,970, dated January 20, 1885.

Application filed September 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD S. WINCHESTER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain
5 Improvements in Shuttle-Operating Mechanism for Looms, of which the following is a specification.

The object of this invention is to provide a cheap and simple means whereby the shuttle
10 of a loom may be driven to and fro in a rapid manner.

To this end it consists, essentially, in a shuttle driver or picker combined with an electro-magnet and armature for imparting motion
15 thereto, and automatic devices for opening and closing an electric circuit in which the magnet is mounted, whereby the attraction of the armature by the magnet is caused to actuate the shuttle-driver.

20 I have represented in the drawings the arrangement which I have found in practice to be most desirable because of its extreme simplicity and reliability.

Referring to the drawings, Figure 1 represents a side elevation of the picker-staff and head and the magnetic attachment for imparting motion thereto. Fig. 2 is a diagram
25 illustrating the manner in which two of my drivers are combined in one loom.

30 Referring to the drawings, A represents a picker staff or lever mounted near one end on a pivot or journal, B, and provided at its short end with an armature, C, which is arranged to vibrate in the field of an electro-magnet, D, the coil of this magnet being embraced in an electric circuit, E, which will be connected
35 with a dynamo-electric machine, a galvanic battery, a storage-battery, or other suitable apparatus, F, for generating or supplying electricity. The circuit E is divided or opened at a suitable point in its length, and the electrodes or terminals G and H are arranged to act respectively upon concentric conducting-wheels I and J, which constitute circuit opening and closing devices, commonly denominated in the art "circuit-controlling devices."
45 The wheel I is of circular form, and remains constantly in contact with the terminal G; but the wheel J has a projection or enlargement upon one side, and is in contact with the terminal H only during the passage of the projection or enlargement thereunder. The re-

sult of this arrangement is that the circuit is closed and the magnet excited during a small portion only of the time of the revolution of
55 the wheels, which will be connected with and driven from any suitable portion of the loom or by an independent motor, as desired.

I have represented in the drawings as one arrangement for driving the circuit-breaking
60 wheel the pinion *a*, applied to the shaft by which the circuit opening and closing wheels are carried, and driven by a pinion, *b*, applied to one of the usual rotary shafts of the loom. When the magnet is excited, the armature C
65 is attracted thereto, the picker-staff A being thereby operated quickly and strongly and its upper end driven forward with great rapidity. To the upper end I propose to apply a picker or other suitable device, K, which may be of
70 ordinary form, for acting upon and impelling the shuttle, these features constituting no part of the invention.

In the drawings, the picker K consists of a reciprocating block having a hole or cavity
75 formed in one end to receive the shuttle, which will fit freely but closely therein. The air confined in the hole or cavity will serve as a cushion to arrest the motion of the shuttle as it advances from the opposite side of the loom. 80

In applying my improvement I provide two combinations of mechanisms, such as above described, and locate the same at opposite sides of the loom, placing the levers or picker-staffs in the position which they ordinarily
85 occupy. The two pairs of circuit closing and opening wheels may be located, as shown in Fig. 2, on opposite ends of a single shaft, or they may be otherwise arranged if preferred, the only requirement being that they shall be
90 timed in such manner as to close the circuits of the respective magnets alternately, whereby the pickers are operated alternately and caused to throw the shuttle to and fro through the shed in the ordinary manner. A spring may
95 be applied, as shown at *c*, Fig. 1, to return the picker-staff to its original or backward position after the attraction of the magnet has ceased, or the impact of the shuttle as it is thrown from the opposite side of the machine
100 may be relied upon for this purpose.

While the details of the mechanism may be modified, provided only that the magnet is arranged to move the device which acts upon

the shuttle, the arrangement represented in the drawings is peculiarly advantageous in that the magnet operating with increased force as the armature approaches its poles serves to impart a peculiarly quick and forcible blow to the shuttle, the motion of the parts being accelerated as the shuttle-driver moves forward, so that although the shuttle is started easily and smoothly it is finally thrown with great swiftness.

My present invention is restricted to those matters and things which are hereinafter specifically claimed.

Having thus described my invention, what I claim is—

1. The combination of the picker-staff pivoted near its lower end and provided with an armature, the electro-magnet to attract said armature, the source of electric supply connected with the magnet, the circuit opening and closing devices, and driving mechanism therefor, said members being constructed and organized for joint operation substantially as described and shown.

2. In a loom, the combination of the two picker-staffs located at opposite sides thereof, the electro-magnets, the source of electric supply connected with said magnets, the circuit-

controlling devices, and operating mechanism for said devices, substantially such as described and shown.

3. In a loom, the combination of the two picker-staffs located at opposite sides, electro-magnets acting to drive the two pickers forward, devices, substantially such as described and shown, to effect the excitation of the two magnets alternately, and the two pickers K, each having the cavity or recess to receive the shuttle, whereby the pickers are caused to drive the shuttle to and fro and the impact of the shuttle applied to return the pickers to their outer position, substantially as described.

4. In a loom, the combination of the two picker-staffs, each provided with an armature, the electro-magnets, the source or sources of electric supply connected with said magnets, the electrodes G and H, the circuit-controlling wheels I and J, and the shaft upon which said wheels are mounted, said parts being constructed and arranged for joint operation substantially as described.

EDWARD STEVENS WINCHESTER.

Witnesses:

WILLARD B. HAYDEN,
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