

No. 771,989.

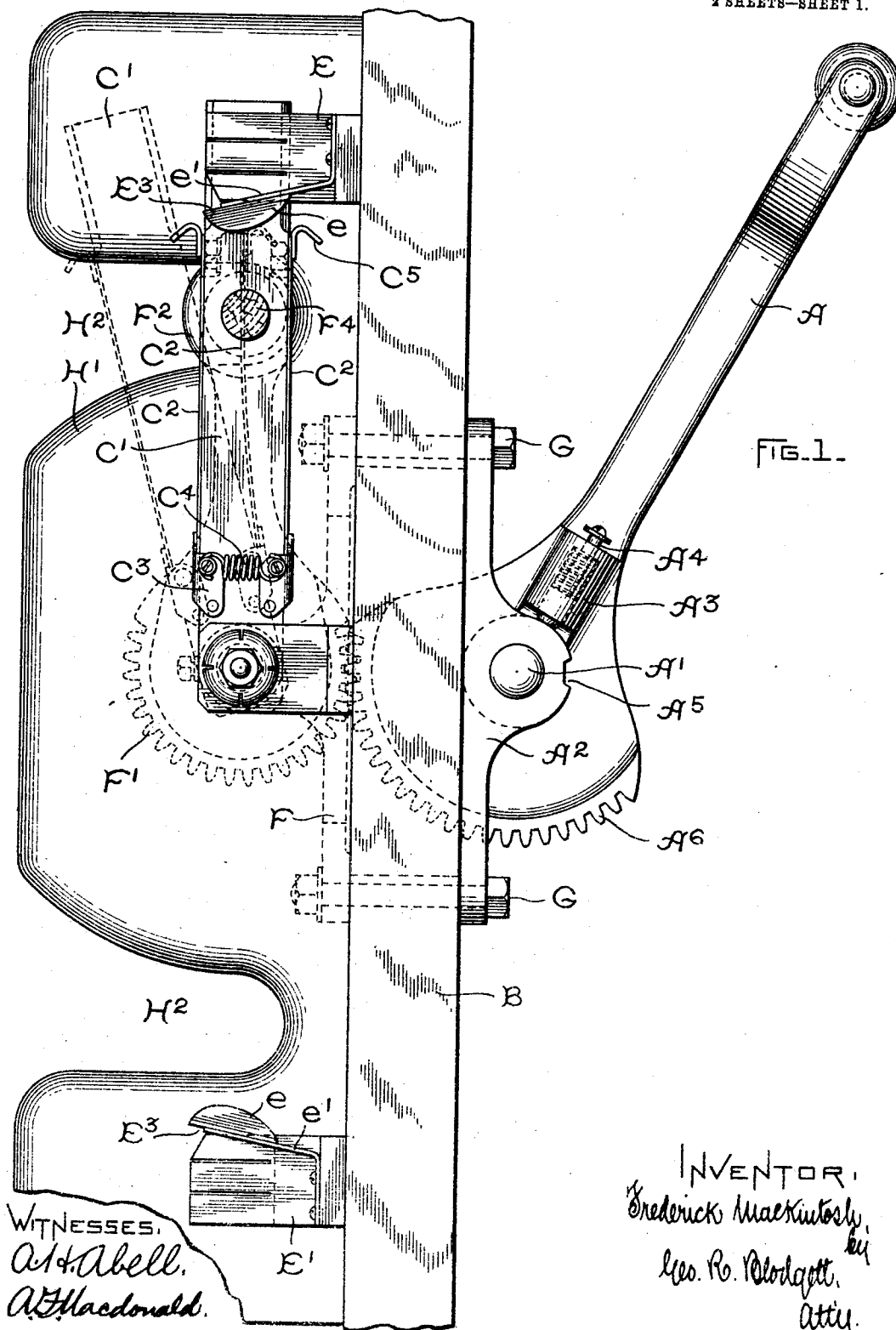
PATENTED OCT. 11, 1904.

F. MACKINTOSH.
ELECTRIC SWITCH.

APPLICATION FILED OCT. 19, 1897.

NO MODEL.

2 SHEETS—SHEET 1.



No. 771,989.

PATENTED OCT. 11, 1904.

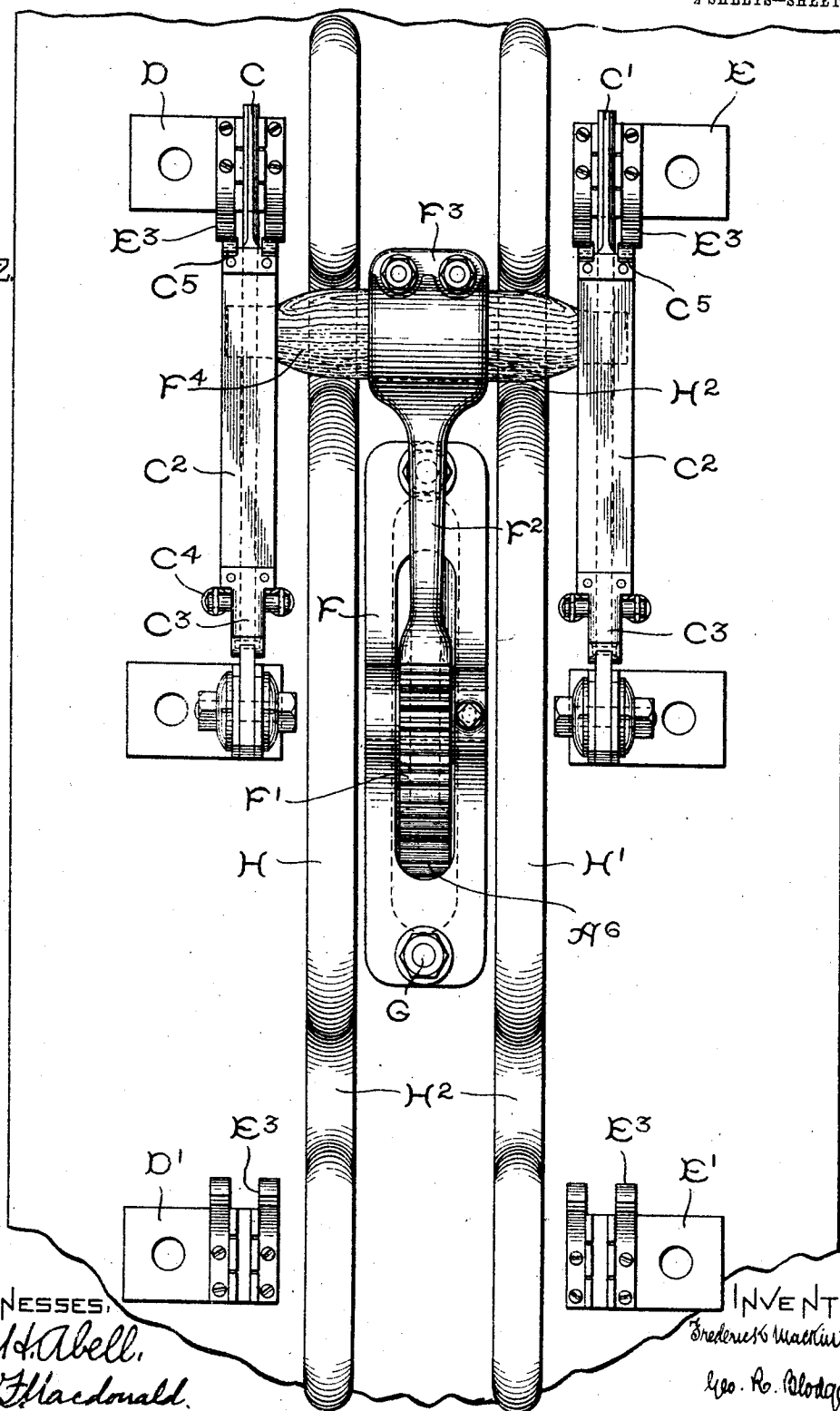
F. MACKINTOSH.
ELECTRIC SWITCH.

APPLICATION FILED OCT. 19, 1897.

NO MODEL.

3 SHEETS—SHEET 2.

FIG. 2.



UNITED STATES PATENT OFFICE.

FREDERICK MACKINTOSH, OF SCHENECTADY, NEW YORK, ASSIGNOR TO
THE GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 771,989, dated October 11, 1904.

Application filed October 19, 1897. Serial No. 655,713. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MACKINTOSH, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

The present invention has for its object to provide a quick-acting reliable switch, intended more particularly for circuits carrying high potentials—as two thousand volts, for example—and also to provide a switch in which the operator is fully protected from the live portions of the switch and the arcs caused by the opening of the circuit.

In the accompanying drawings, Figure 1 is a side elevation of my improved switch, and Fig. 2 is a rear elevation.

The operating-handle A is located on the front side of a marble or slate support B, and the switch-blades C C' and terminals D D' and E E' on the back of the support. Handle A is pivoted on shaft A'. The latter is supported in a bearing A², which is secured to support B and bearing F by bolts G.

Formed integral with the handle is a lug A³, and mounted therein is a spring-pressed plunger A⁴, arranged to enter slot A⁵ in the bearing and hold the handle in its midway position. The handle is provided with a gear A⁶, meshing with gear F', mounted in bearing F. In order to make the angular movement of the handle less than that of the switch-blades, the diameter of gear A⁶ is greater than that of gear F'.

Formed integral with gear F' is an arm F², provided with a clamp F³ at its outer end. Mounted in the clamp and extending at right angles thereto is a piece of insulating material F⁴. Situated on each side of the actuating mechanism are pivoted switch-blades C and C', insulated from each other and from the actuating mechanism by partitions H and H'. The partitions are provided with curved slots H² to receive the insulating-piece F⁴. Each switch-lever is pivoted at one end to a standard, which also forms a part of the circuit. Blade C' is arranged to make contact with terminals E or E' and blade C with terminals D or D'. The blades are connected for simultaneous

movement by insulating-piece F⁴, which extends through them.

In order to keep the switch-blades clean and smooth, so that they will make good contact, removable sparking terminals E³ are employed. These consist of small contacts e, mounted on supports e' and arranged to engage spring-contacts C², carried by the switch-blade. Each fixed switch-terminal is provided with a pair of these arcing contacts, one on each side. The switch-blades are provided with pairs of flat spring-contacts, which are mounted in holders C³. The latter are pivoted to the blades and are connected by spiral springs C⁴, which hold them in place. The outer end of each spring is provided with a pair of removable arcing tips C⁵, situated on each side of the blade. These tips are so arranged that when the switch is actuated they will make contact with the stationary sparking terminals E³ and keep the circuit closed until the lever is well out of the way, after which they interrupt the circuit with a snap.

In Fig. 1 the switch-levers are shown in dotted lines in the act of breaking the circuit, and it will be seen that blade C' has entirely left the terminal and that the circuit is completed through contact e and spring C². The operating-handle being situated on the front of the switchboard or other support, there is no danger to the operator either from excessive arcing or from touching any live portion of the switch. Arm F² being well insulated from the switch-levers, there is no danger of a short circuit at this point, and further protection is afforded both to the working parts of the switch and the operator by partitions H and H'. By using gearing between the switch-levers and the operating-handle the angular movement of the handle is made much less than that of the switch-blade, thereby facilitating quick interruption of the circuit, which is a very important feature in high-potential work.

The invention is shown as applied to a double-pole double-throw switch; but it can easily be applied to any desired form of such devices.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An electric switch comprising an insu-

100

lating-support, a pivoted switch-lever on one side thereof, a pivoted operating-lever on the other side, intermeshing gearing between the two, an elastically-mounted contact, and a detent for arresting the same when the operating-lever is shifted until energy is stored to quickly separate the contacts.

2. An electric switch comprising an insulating-support, a pivoted switch-lever on one side thereof, a pivoted operating-lever on the other side, intermeshing gearing between the two, an elastically-mounted secondary contact on the switch-arm, and removable sparking terminals or tips coöperating therewith.

3. An electric switch comprising a pivoted switch-arm, an operating-handle, an intervening insulating-support between the two, intermeshing gearing between the two, and an auxiliary spring-actuated snap-contact on the switch-arm adapted to break the circuit after the main contact has been opened.

4. An electric switch comprising a support of insulating material, a double-pole switch-arm and its terminals on one side of the support, the arm being journaled for movement in a plane perpendicular to the support, and an operating-handle on the other side of the support geared to the switch-arm to increase its relative angular movement; said operating-handle being also movable in a plane perpendicular to the support.

5. In an electric switch, the combination of a support, an operating-handle pivoted to one side of the support, a switch-blade pivoted to the other side of the support, both movable in a plane perpendicular to the support, a mechanical connection between the blade and handle, fixed terminals for the blade, an arcing contact, and a spring-pressed contact actuated by the handle, that interrupts the circuit after the blade has left the fixed terminal.

6. In a double-throw switch, the combination of a pivoted handle located on the front of a support, a switch-blade pivoted on the back of the support, gearing between the han-

dle and blade, fixed terminals for the blade, arcing terminals, and a pair of spring-pressed arcing contacts carried by the lever and so arranged that one contact breaks the circuit in one position of the switch and the second in the other.

7. In an electric switch, the combination of an operating-handle, pivoted switch-blades, an insulating connection between them, a pivoted arm secured at its outer end to the insulating connection, and gearing between the handle and pivoted arm.

8. In an electric switch, the combination of a support, pivoted switch-blades on one side thereof insulated from one another, a pivoted arm secured to the insulating connection between the blades at one end and provided with a gear at the other, and an operating-handle pivoted to the other side of the support having a gear meshing with the pivoted arm-gear, the relation between the gears being such that the blades travel through a greater angular distance than the handle.

9. In an electric switch, the combination of pivoted blades, an insulating connection between them, an operating-arm secured to the connection, partitions between the arm and the blades, an operating-handle, and gears between the handle and the operating-arm.

10. In a double-throw quick-break switch, the combination of a pivoted blade, fixed terminals with which it makes contact, arcing terminals, a pair of flat spring-terminals mounted in sockets on the blade, a spring connecting the terminals, and arcing contacts located on the switch-terminals and arranged to hold the circuit closed until after the blade has moved a certain distance from its fixed terminals.

In witness whereof I have hereunto set my hand this 9th day of October, 1897.

FREDERICK MACKINTOSH.

Witnesses:

B. B. HULL,

E. W. CADY