(No Model.)

# J. F. McLAUGHLIN.

## ELECTRIC SWITCH.

No. 432,207. Patented July 15, 1890.

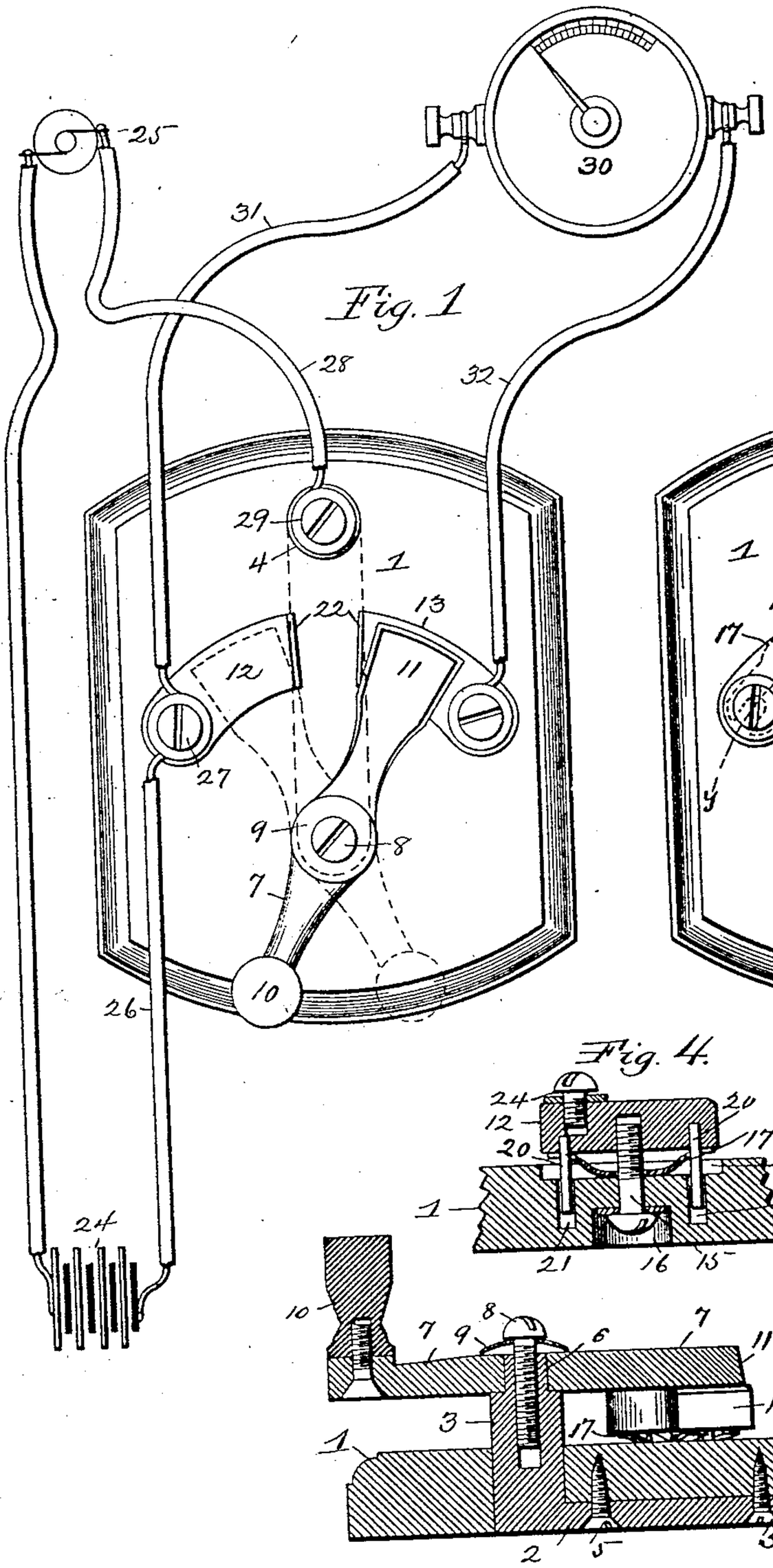


Fig. 1

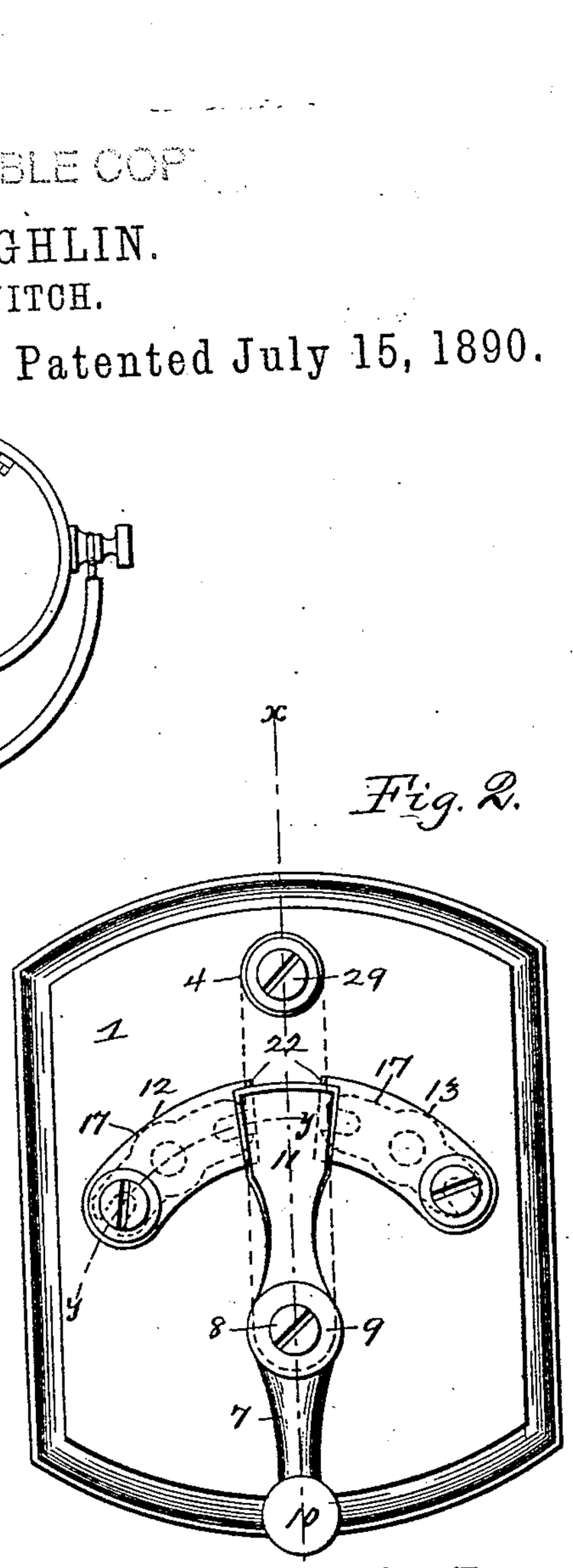


Fig. 2.




Fig. 4.

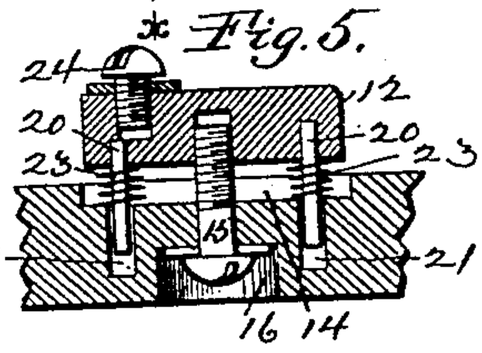


Fig. 5.

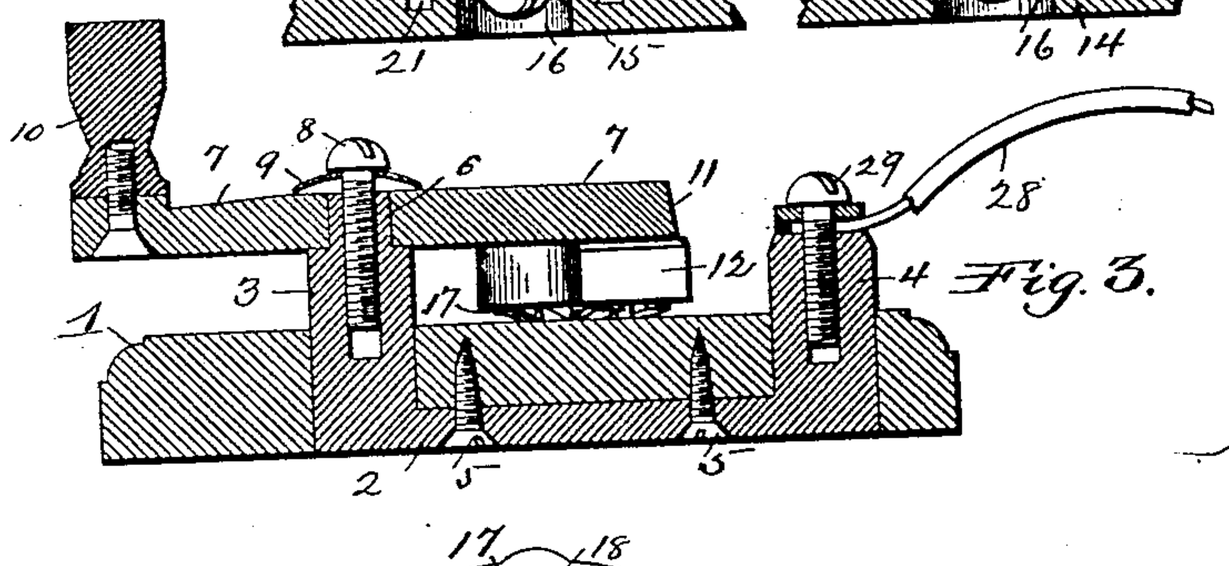


Fig. 3.

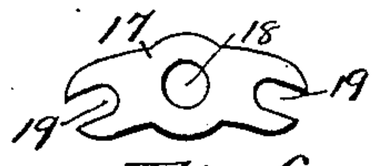


Fig. 6

Witnesses:
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# UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

## ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 432,207, dated July 15, 1890.

Application filed April 17, 1890. Serial No. 348,330. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Switches, of which the following is a specification.

This invention has reference to improvements in electric switches; and its main object is to switch a measuring-instrument into or out of the circuit without breaking or otherwise materially affecting the latter.

It consists, essentially, of a switch-arm included in the main circuit and two contact-plates in the path of said arm, one being included normally in the main circuit and the other in a circuit including the measuring-instrument, the arrangement being such that in one position of the switch the current from the generator flows directly to the translating device and in the other position of the switch to which it is turned without at any time breaking the circuit the measuring-instrument is included in the circuit with the translating device.

There are special advantages, due to some of the features entering into the construction of the improved switch, which are applicable to other switches, and these advantages will appear from the following detailed description, in which reference is had to the accompanying drawings, forming part of this specification; but to the exact construction illustrated therein I am in no manner confined, since, as will be evident, such construction may be variously modified without departing from the spirit of my invention.

In the drawings, Figure 1 is a plan view of the switch with the source of electricity and translating and measuring devices and the circuit-connections shown diagrammatically. Fig. 2 is a similar view of the switch with the switch-arm in a central position bridging the two contact-plates. Fig. 3 is a vertical section on the line *x x* of Fig. 2. Fig. 4 is a section taken on the curved line *y y* of Fig. 2. Fig. 5 is a similar section of a modified form of the device shown in Fig. 4, and Fig. 6 is a plan of a detail of the apparatus shown in Fig. 4.

Referring to the drawings, there is shown a base 1, of any suitable insulating material, in which is seated a casting 2, consisting of two posts 3 4, joined at their lower ends, and spaced a distance apart by an integral portion of the casting. The two posts 3 4 extend through the base 1 and above the face of the same, while the portion of the casting joining the two posts is seated in a recess formed on the under side of the base, so that the bottom of the casting is flush with the latter, and through this said portion of the casting extend screws 5, which serve to secure it to the base 1.

The post 3 is reduced in size at its upper end, as shown at 6, to form a spindle or pivot for a switch-arm 7, which is held at a distance above the base 1 by the shoulder of the spindle, as shown, and it is prevented from being lifted from the post by a screw 8, entering a nut formed in the said post, and between the head of the screw and the upper face of the switch-arm there is interposed a spring-washer 9, which serves to maintain at all times good electrical contact between the switch-arm and its supporting-post. At the outer end the switch-arm is provided with a manipulating-handle 10, of insulating material, and at the inner end it is slightly expanded, as shown at 11. In the path of the expanded end of the switch-arm there are two curved contact plates or blocks 12 13, with their adjacent ends at such distance apart that the said expanded end 11 of the switch-arm on passing from one contact-plate to the other will bridge the space between them, and thereby establish good contact with one plate before leaving the other.

The base 1 is recessed, as shown at 14, to receive the contact-plates, which are held thereto by screws 15, passing loosely through the base and projecting upward and entering nuts formed in the said contact-plates. The holes in the base 1 for the passage of the screws 15 are countersunk, as shown at 16, to receive the screw-heads and permit the screws to have a limited longitudinal movement, which is participated in by the contact-plates 12 and 13. Within each recess 14 in the form most clearly shown in Figs. 2 and 4 there is a curved spring-plate 17, provided with a central perforation 18 for the passage of the screw 15, and end slots 19 for the pas-

sage of guide-pins 20, depending from the contact-block and entering holes 21 in the base 1. The spring-plates 17, it will be observed, are curved in one plane to conform to the shape of the contact-plates and recesses 14, and are also curved in another plane, so that the ends support the said contact-plates at a distance above the bottoms of the recesses 14 limited by the screws 15. At their highest point the contact-plates have their upper or contact faces slightly above the lower or contact face of the switch-lever, and when the latter is moved over the said contact-plates the supporting spring-plates 17 yield sufficiently to permit such operation, thus insuring at all times good electrical contact between the switch-arm and plates and providing a means which compensates for wear between the contact-surfaces. The two adjacent ends of the contact-plates may be beveled at their upper edges or corners, as shown at 22, so that the switch-arm may ride easily onto the surfaces of the said contact-plates.

A slightly-modified form of mounting for the contact-plates is shown in Fig. 5, in which the spring-plate 17 is replaced by helical springs 23, surrounding the guide-pins 20 and interposed between each of the said contact-plates and the bottom of the respective recess 14.

The switch constructed as described is included in a main circuit, also including a battery 24 or other suitable source of electricity and a translating device 25, which in the present instance is diagrammatically represented as an electric motor. The terminal of a conductor 26, coming from the battery 24 and forming a part of the main circuit, is connected to the contact-plate 12 by means of binding-screw 27, or otherwise, and another conductor 28, also forming part of the main circuit and connected to the motor, is secured to the post 4 by means of a binding-screw 29. The contact-plate 12 is connected to a measuring-instrument 30 by a conductor 31, secured to the said contact-plate by the screw 27, and the contact-plate 13 is also connected to the measuring-instrument 30 by a conductor 32. When the switch-arm is on the contact-plate 12, the current will pass by the conductor 26 from one pole of the battery through the contact-plate 12, the switch-arm, the casting 2, and the conductor 28 to the motor 25, from whence it will return to the other pole of the battery.

When it is desirable to introduce the measuring-instrument into the circuit, the switch is moved onto the other contact-plate 13, when the current will pass from the battery by the conductors 26 and 31 to the measuring-instrument 30, thence by the conductor 32, contact-plate 13, the switch-arm, casting 2, and conductor 28 to the motor, from whence it returns to the battery.

It will be observed that the measuring-instrument may be switched into or out of the circuit without at any time breaking the circuit from the battery to the motor, for, as has been before explained, the switch-arm makes contact with one contact-plate before it leaves the other.

Having now fully described my invention, I claim and desire to secure by Letters Patent—

1. In an electric switch, the combination, with two contact-plates and a switch-arm adapted for making contact with either or both of the contact-plates, of a charged electric circuit with a translating device therein, terminating in one of the contact-plates and in the switch-arm, respectively, and an electric measuring device, the terminals of which are connected with the two contact-plates, respectively, substantially as described.

2. In an electric switch, the combination, with a suitable base and a pivoted switch-arm, of curved contact-plates in the path of said arm, and springs interposed between the base and contact-plates, said springs being curved in one plane to conform to the shape of the contact-plates and bent up at the ends to support the ends of said plates, and being itself supported in the middle, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES F. McLAUGHLIN.

Witnesses:

HERBERT P. KER,

EDWIN F. GLENN.