

No. 763,332.

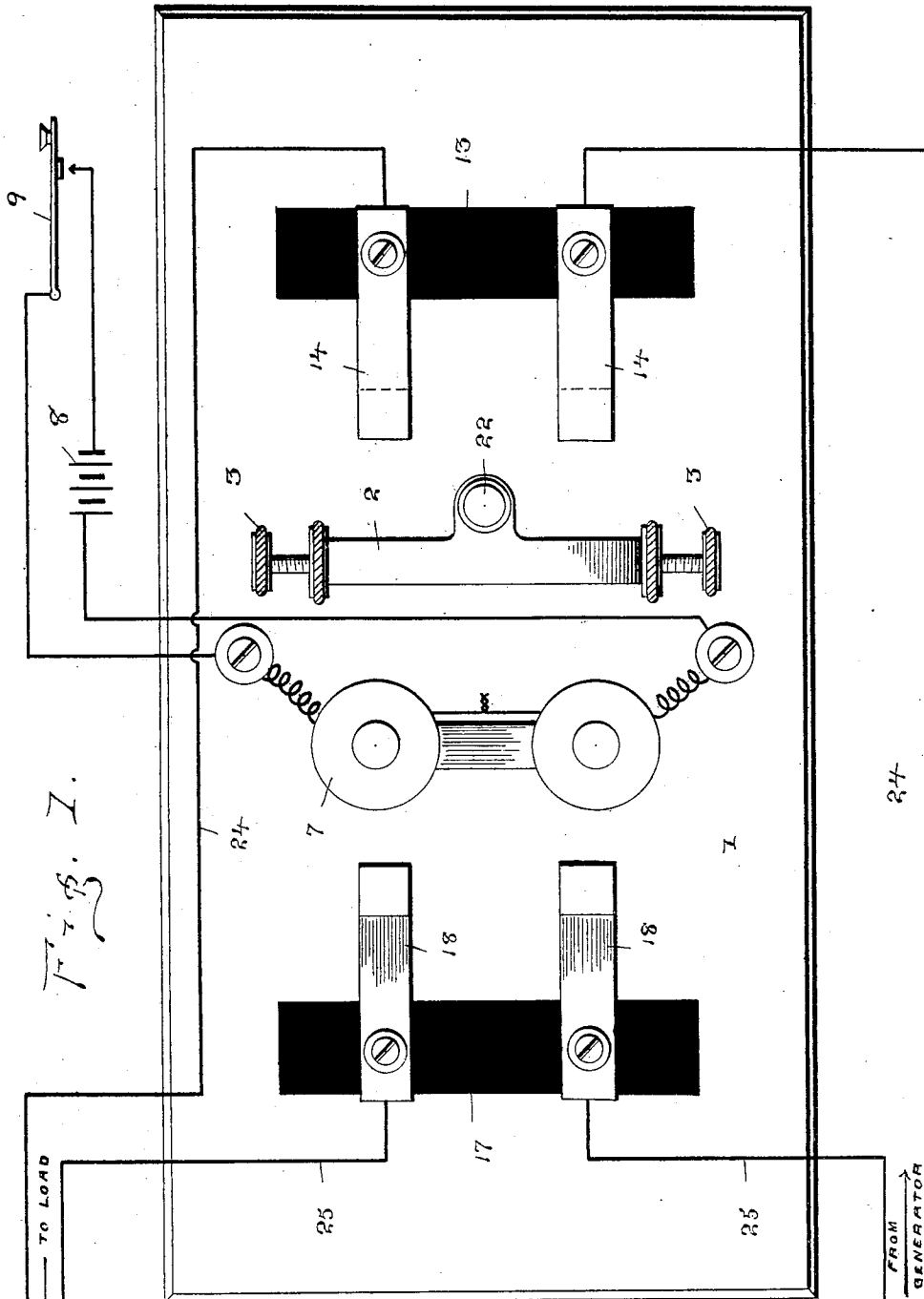
PATENTED JUNE 21, 1904.

B. S. SMITH.
RELAY.

APPLICATION FILED FEB. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

J. W. Wiley.
Albert D. Lawrence.

INVENTOR

Burdette Samuel Smith.
BY *Victor J. Evans*
Attorney

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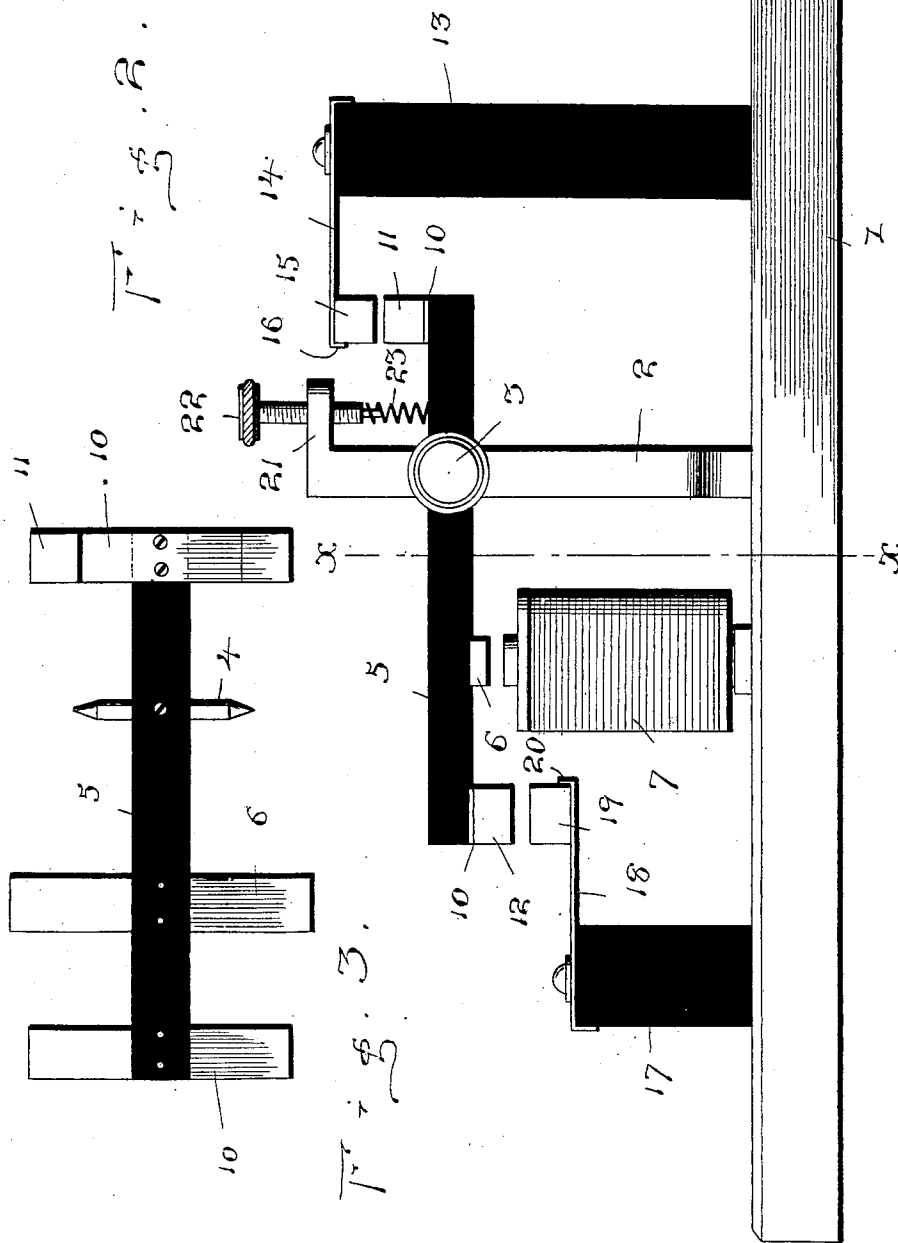
B. S. SMITH.

RELAY.

APPLICATION FILED FEB. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 2.



WITNESSES:

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No. 763,832.

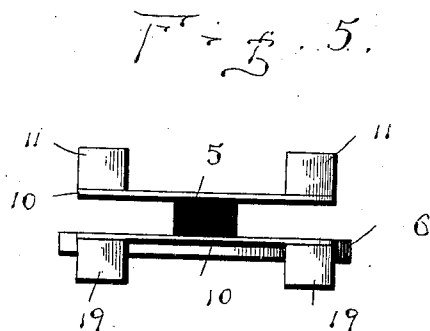
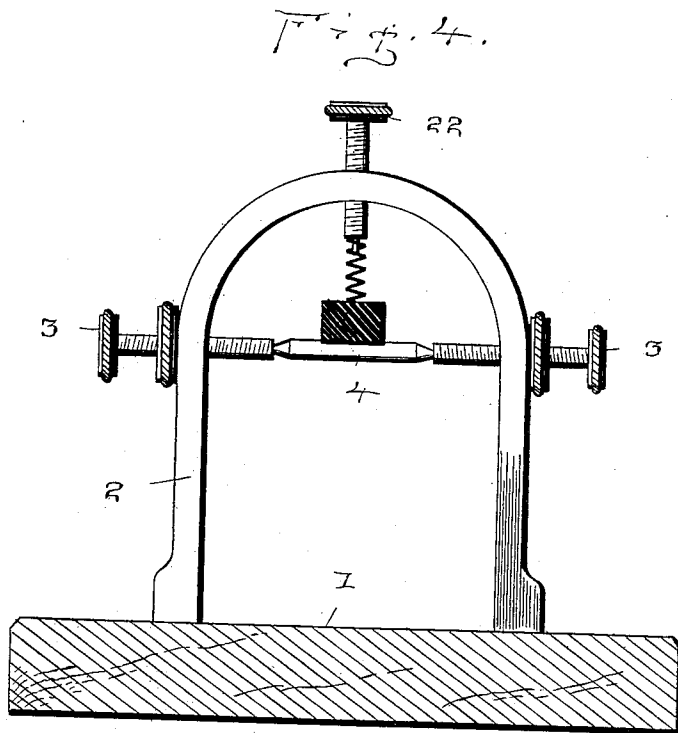
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B. S. SMITH.
RELAY.

APPLICATION FILED FEB. 14, 1903.

NO MODEL

3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

BURDETTE S. SMITH, OF ELYRIA, OHIO.

RELAY.

SPECIFICATION forming part of Letters Patent No. 763,332, dated June 21, 1904.

Application filed February 14, 1903. Serial No. 143,448. (No model.)

To all whom it may concern:

Be it known that I, BURDETTE S. SMITH, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented new and useful Improvements in Relays, of which the following is a specification.

My invention relates to new and useful improvements in relays; and its object is to provide a device of this character adapted to simultaneously open or close the positive and negative wires of a circuit preferably having a voltage of not more than five hundred volts direct current and a carrying capacity of from one to fifteen amperes.

A further object is to arrange four contacts in the relay, whereby the heavy arc occurring during a single break in a high-voltage circuit is overcome without the use of a magnetic blow-out attachment.

The invention consists in providing a yoke within which is journaled a strip having an armature secured thereto and extending over magnets which are included in the primary circuit. At each end of the strip is arranged a laterally-extending strip of conducting material having contact-blocks, preferably, of carbon, at the ends thereof. The pivoted strip is held normally supported in a substantially horizontal position by means of a spring or any other suitable resilient device. Blocks of non-conducting material are arranged adjacent to the opposite ends of the strip above referred to, and extending from each of these are two strips of conducting material having depending contact-blocks secured thereto and located in the paths of the contacts connected to the fulcrumed strip. The four contacts upon the said strip are adapted to simultaneously make or break the circuit through the strips extending from the non-conducting blocks, and each of the wires of the circuit to which a generator is connected includes two of the conductor-strips upon the non-conducting blocks. It will thus be obvious that when the primary circuit is closed and the magnets energized the four contacts connected to the armature of the magnet will be thrown simultaneously against the contacts on the ends of the conducting-strips, and the circuit will thus be promptly established through the

secondary circuit within which the generator is located.

The invention also consists in the further novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is a plan view of my improved relay with the armature removed and showing diagrammatically the wires connected thereto. Fig. 2 is a side elevation of the relay. Fig. 3 is a detail view of the armature and contacts connected thereto. Fig. 4 is a section on line *x x*, Fig. 2; and Fig. 5 is an end elevation of the movable strip connecting the same.

Referring to the figures by numerals of reference, 1 is a base of any suitable material upon which is arranged a yoke or standard 2, having set-screws 3 in opposite sides thereof and between the inner ends of which is supported an arbor 4. A strip 5 of non-conducting material is secured to the arbor and movable therewith, and an armature 6 extends laterally from opposite sides of this strip and is located at points above the cores of magnets 7. These magnets are included within a primary circuit, having a battery 8 therein and a suitable circuit-closure 9. At each end of strip 5 is secured a laterally-extending strip 10 of conducting material, and upon the upper surface of one of these are arranged contacts 11, preferably formed of blocks of carbon. Contacts 12 are secured to the lower surface of the other strip 10, and in both instances said contacts are secured to the ends of their strips. A block 13 is arranged upon the base and extends upward above the contacts 11. This block is of non-conducting material and has metal strips 14 projecting therefrom and above said contacts 11. To the lower surface of each of these strips is secured a contact-block 15, which is arranged at the inner end of the strip and is prevented from turning thereon by means of a downwardly-projecting flange 16, formed integral with strip 14. A block 17 of non-conducting material is arranged upon the base adjacent to the other end of strip 5, and this also has inwardly-ex-

tending arms 18, of conducting material, upon the inner ends of which are secured contact-blocks 19, which are prevented from turning in relation to their strips by means of upwardly-extending flanges 20.

An ear 21 projects from the upper end of the yoke 2 and has a screw 22 mounted thereon which is adapted to bear upon a spring 23, located upon strip 5 at a point between its fulcrum and the contacts 11. This spring serves to hold contacts 11 and 12 normally removed from blocks 15 and 19; but the strip is preferably so balanced that an exceedingly weak current passing through magnet 7 will be sufficient to attract the armature thereto, and thereby establish electrical connections between the contacts 11 and 15, 12 and 19. The wire 24, which is included in a secondary circuit containing a generator, (not shown,) is broken and connected to the two strips 14, and the other wire 25 of said secondary circuit is also broken and connected to the strip 18. When it is desired to establish the secondary circuit, the magnets 7 are energized and the four carbon contact-blocks 11 and 12 are promptly thrown upward and downward, respectively, upon the blocks 15 and 19. The current is thus established through the positive and negative wires of the secondary circuit. As soon as the primary circuit is broken spring 23 will promptly throw the contacts upon strip 5 out of electrical connection with contacts 15 and 19, and as the circuit is broken through the wires thereof no arc will be produced, and therefore it is unnecessary to provide a magnetic blow-out attachment.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus described the invention, what is claimed as new is—

1. In a relay, the combination with a base having a magnet thereon adapted to be in-

cluded in a primary circuit; of an insulating-block at each side of the magnet, inwardly-extending oppositely-arranged pairs of conducting-strips connected to the blocks, said pairs being located in different planes, and each pair being electrically connected to a wire of a circuit, oppositely-arranged contact-blocks upon the pairs of strips, a yoke mounted upon the base between the strips, oppositely-arranged and adjustable bearings within the yoke, an arbor interposed between and journaled within the bearings, a non-conducting strip secured to and movable with the arbor, an armature for the magnet secured to the non-conducting strip, transversely-extending conducting-strips at the ends of the pivoted non-conducting strip and projecting laterally from the sides thereof, depending contact-blocks secured to one of said transversely-extending conducting-strips, upwardly-extending blocks upon the other one of said conducting-strips, a spring upon the non-conducting strip for holding its contacts normally out of circuit, and means for adjusting the tension of said spring.

2. The combination with the positive and negative wires of a secondary circuit, and contacts connected to each wire and normally insulated from each other; of a primary circuit including a magnet, an armature, a yoke, a non-conducting strip pivotally mounted within the yoke and extending over and under the contacts of the wires of the secondary circuit, respectively, conducting-strips upon the pivoted non-conducting strip, contacts thereon adapted to complete the circuits between the contacts of each of the first-mentioned pairs, a spring upon the non-conducting strip, and means for adjusting the tension of the spring, whereby the contacts of the non-conducting strip are held normally removed from the wires of the secondary circuit.

In testimony whereof I affix my signature in presence of two witnesses.

BURDETTE S. SMITH.

Witnesses:

WM. A. DREHER,
A. W. CINNIGER.