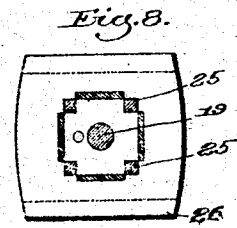
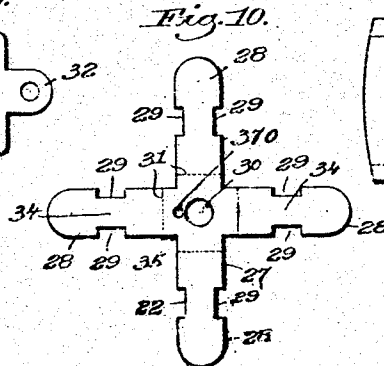
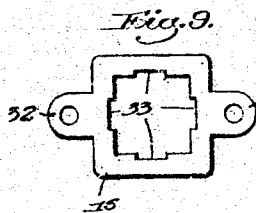
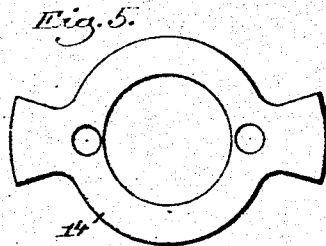
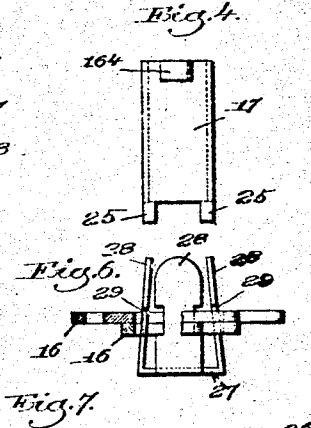
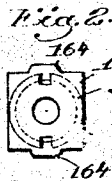
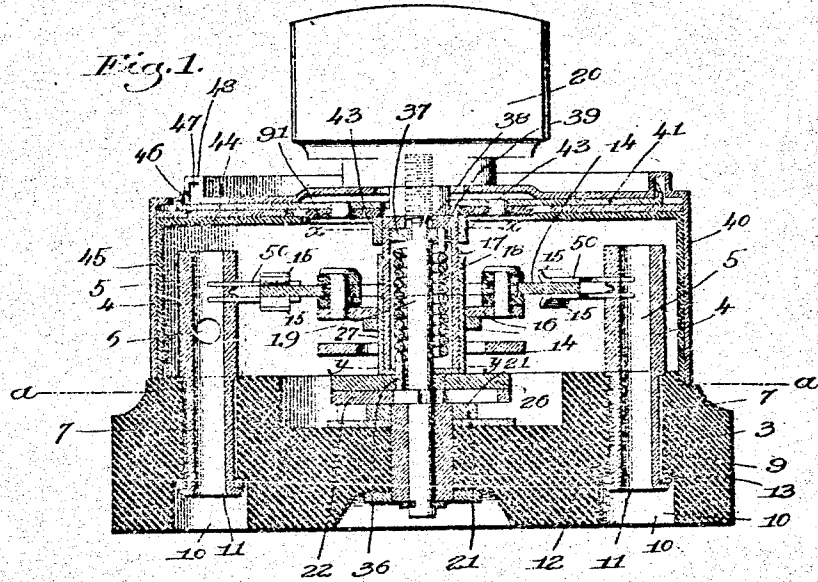


S. A. KOLTONSKI.
SNAP SWITCH.
APPLICATION FILED OCT. 26, 1908.

972,387.

Patented Oct. 11, 1910.

2 SHEETS-SHEET 1.



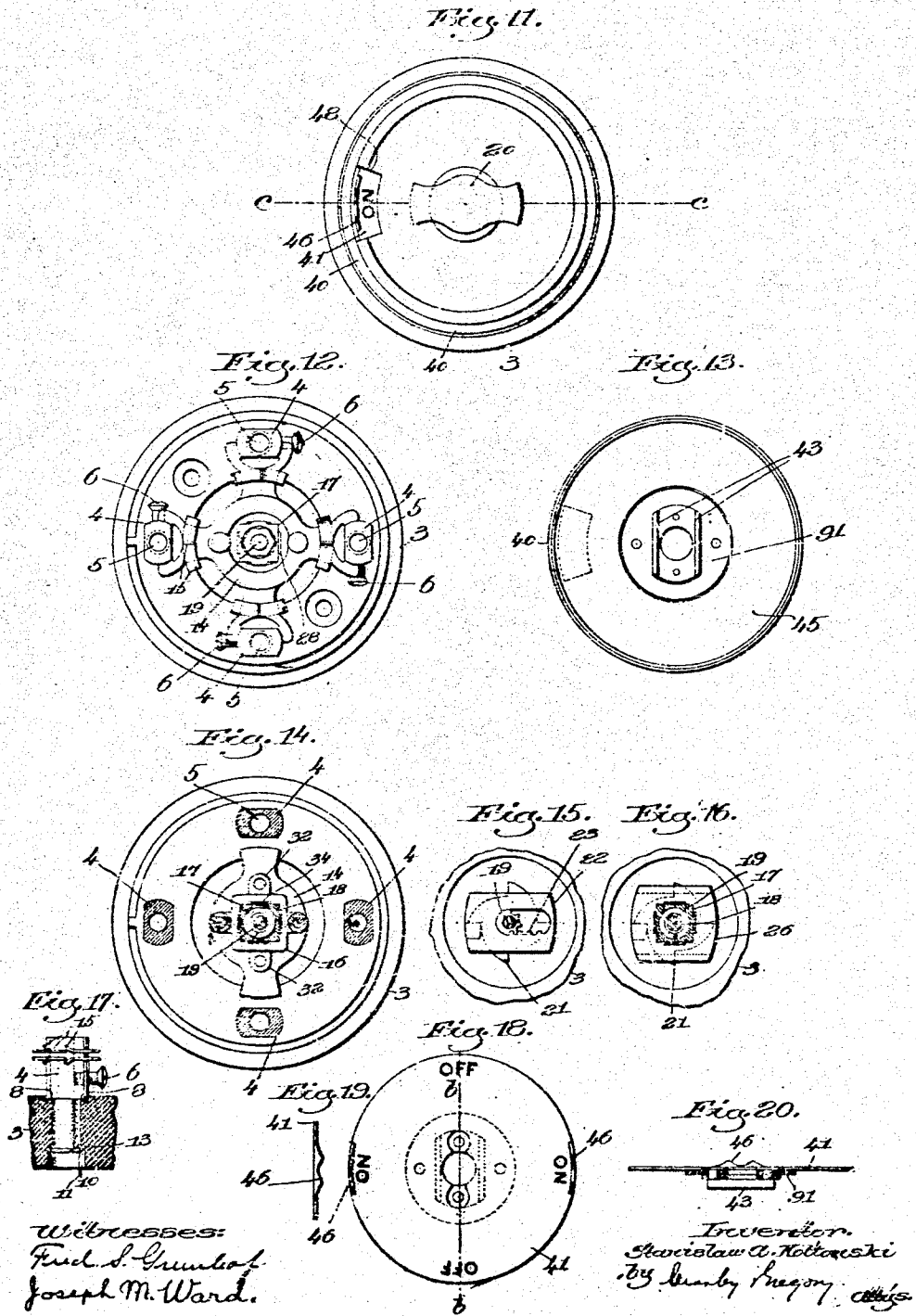
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UNITED STATES PATENT OFFICE.

STANISLAW A. KOLTONSKI, OF BOSTON, MASSACHUSETTS.

SNAP-SWITCH.

972,387.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed October 26, 1906. Serial No. 340,646.

To all whom it may concern:

Be it known that I, STANISLAW A. KOLTONSKI, a subject of the Czar of Russia, and a resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Snap-Switches, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to snap switches, and has for its object to provide a novel construction of base and a novel way of mounting the binding posts therein; to provide a novel construction of binding post; to provide a novel construction of contacts for the binding post; to provide a novel way of mounting the connecting bars; to provide a novel indicator for indicating whether the switch is on or off and to improve generally in other respects the construction of the switch.

I will first describe one embodiment of my invention which has been selected for illustrative purposes, and will then point out the novel features in the appended claims.

In the drawings, Figure 1 is an enlarged vertical section through a snap switch embodying my invention on the line *c-c*, Fig. 11; Fig. 2 is a top plan view of the spindle and of the support for carrying the connector bars; Fig. 3 is a section through the spindle and support on the line *x-x*, Fig. 1; Fig. 4 is a side view of the support detached; Fig. 5 is a plan view of one of the connector bars; Fig. 6 shows one step in assembling the parts; Fig. 7 is a side view of the base plate on which the spindle is supported; Fig. 8 is a section on the line *y-y*, Fig. 1; Fig. 9 is a view of the carrier for the connecting bars; Fig. 10 is a detail of the locking member; Fig. 11 is a top plan view of the switch; Fig. 12 is a top plan view with the cover removed; Fig. 13 is an interior view of the cover; Fig. 14 is a section on the line *a-a*, Fig. 1; Figs. 15 and 16 are details of the snap mechanism; Fig. 17 is a front view of the post; Fig. 18 is a view of the indicator; Fig. 19 is a side view thereof; Fig. 20 is a section on the line *b-b*, Fig. 18.

3 designates the usual base on which the binding posts are secured, this being of porcelain or some other suitable insulating ma-

terial, and 4 designates the binding posts which carry the usual contacts 50 and to which the wires are secured. The binding posts are of novel shape and are designed to have the maximum strength at the sides thereof where the set screws for gripping the wires are screw-threaded into them without giving them too large a diameter, and are shaped to provide on opposite sides substantial shoulders or rests to engage the top of the base. As seen in Figs. 12 and 14 the binding posts are substantially elliptical or oblong in cross sectional shape, and the conductor-receiving aperture 5 is centrally situated. This construction provides an increased thickness of material at the sides of the posts where the set screw 6 is screw-threaded into the post but gives the post a minimum diameter in a direction radially of the switch. Where the binding post is constructed in this way it is possible to get an increased thickness of material for the set screw 6 to screw into without increasing that diameter of the binding post which extends radially of the switch. Each binding post is secured to the base 3 in a novel way. Each binding post is provided with the shank portion 7 which is preferably of smaller diameter than the upper part of the post, and which is centrally located thereby to produce the two shoulders 8, one on each side of the post. Said shank portion is received in an aperture 9 in the base 2, the lower end of which is counterbored, as at 10, and the shoulders 8 bear against the top of the base, and thus hold said post in an upright position. The post is secured to the base by forming on the end of the shank 9 an enlarged head 11, which by co-acting with the shoulder 12 formed by the counterbore 10 permanently unites the post to the base. The two shoulders 8, one on each side of the post, serve to maintain the correct vertical position of the post, and the head 11 prevents the post from becoming disconnected from the base. The base may also be provided with a slight recess on its upper face to receive the lower end of the enlarged portion of the post, as shown in Fig. 1, and because this enlarged portion is non-circular, the recess prevents the post from turning. Since the posts are

usually made hollow the lower end of the shank 7 may be spun out or otherwise expanded to form a flange or head 11 which overlies the shoulder 12. A suitable washer 13 of non-yielding material is first placed on the shank before the spinning or expanding processes to avoid any cracking or breaking of the porcelain during the formation of the head. By this construction each binding post is permanently secured to the base in such a way that it cannot become loosened, and since the securing means is located within the recess or counterbore it is impossible for the circuit to be short circuited by the accumulation of moisture or other foreign matter beneath the base.

The spring contacts 50 may be secured to the binding post in any suitable way. In order to get a good contact between them and the connector bars 14, it is necessary that these connector bars and spring contacts be parallel to each other. It is not always possible to maintain this parallelism, and in order to provide a good contact between the connector bars and the contact members under all conditions I preferably make the latter sectional, the sections being independently yieldable. Referring to Fig. 17 it will be seen that the two sides of each contact member are made in a plurality of sections, each of which has the flaring lips 15. With this construction if the plane of the connector bar is not parallel with that of the contact member the various sections of the contact members will adapt themselves to the position of the contact member and thus afford a much better contact than if each part of the contact member were in one piece. The connector bars 14 are each rigidly mounted on a carrier 16, and the carriers are mounted on the central support 17 within which the usual spring 18 is confined.

19 designates the usual spindle to the upper end of which is screwed the thumb piece or button 20.

21 is the usual stationary ratchet, and 22 the locking slide which is provided with rack teeth 23, see Fig. 15, that engage a pinion 24 on the spindle 19. The construction and operation of this ratchet and locking slide are so well known that further description thereof is not necessary.

The support 17 is non-circular, it preferably being square, and at its lower end it has projections 25 that enter the plate or holder 26 within which the locking slide 22 operates. In order to lock the carriers 16 to the holder I make use of the following construction. I form a locking member of sheet metal from a blank 27, such as shown in Fig. 10, it having four arms 28, each provided with oppositely-disposed notches 29, said blank having a central aperture 30.

The arms of this blank are then bent on the dotted lines 31 so as to stand at right angles to the base, as shown in Fig. 6, and the arms when thus bent are inserted into the two carriers 16, one for each connector bar, until said carriers stand opposite the notches 29. Each carrier has the shape shown in Fig. 9, that is, it has the central frame provided with the oppositely-disposed ears 32 to which the corresponding connector bar is secured (each connector bar being suitably insulated from its carrier), and it is provided with the notches 33, one on each side, which are of a size to receive the reduced portions 34 of the arms 28 formed by the notches 29. After the carriers have thus been placed over the bent-up arm 28, the central support 17 is inserted between the arms, said support being of such a size as to force said arms into the notches 33. During this operation the projections 25 on the supports 17 fit into the corners 35 of the locking member and enter apertures in the guide or plate 26, as best seen in Fig. 8. With this construction the central support 17 holds the locking arms 28 firmly in the notches 33, and the notches 29 hold the carriers 16 in position. In practice I propose to make the notches 29 slightly longer than the thickness of the two carriers 16, so that when the structure is assembled there is sufficient play in the notches 29 to permit the carriers to move sufficiently so that the connector bars may readily adjust themselves to the position of the contact members 50. The two carriers are not secured together, but each is mounted independently on the support 17, and, therefore, each connector bar may have a slight movement independent of the other, and consequently if one pair of contact members 50 are slightly out of alinement the corresponding connecting bar may adjust itself to their position without interfering with the proper operation of the other connecting bar. The connecting bars are rigidly secured to the carriers in any suitable way and are properly insulated therefrom. It will be understood, of course, that if the switch is a single pole switch only one carrier and one connector will be used.

The spring 18 has its lower end 36 rigidly fastened to the plate or guide 26, said lower end of the spring entering a hole 37 through the locking member 27 and being received in a hole in the guide 26. The upper end of the spring 18 is secured to the anchor plate 37 which is mounted to turn with the spindle 19.

My switch is of that type in which the spindle 19 is arranged to be inserted in place from the bottom of the movement, and the anchor member 37 is put in position after the spindle, the support 17 and the spring

have been assembled. In my invention, however, I have provided a construction in which the anchor member when in place is located entirely within the support, this being new so far as I am aware in the above-described type of switch. The anchor member is provided with the central slot which is of a shape to fit the non-circular portion 38 of the spindle, and this non-circular portion is of such a length that a portion thereof extends above the top of the support 17, as clearly seen in Fig. 1. This construction permits the anchor member to be slipped into place at the upper part of the non-circular portion 38, and when it is located over the bore of the support 17 it drops downward to engage the upper end of the spring, as shown in Fig. 1, in which position it is received entirely within the central support 17. It is held in place by means of a locking nut 39 which is screwed on the upper end of the spindle. Said nut serves to maintain the anchor member in its proper position at the lower end of the non-circular portion 38 and holds the complete switch together.

40 designates the usual cover for covering the operative parts of the switch. In connection with the cover I have provided an indicator which is adapted not only to visually indicate whether the switch is open or closed, but which is of such a construction that a person may tell by the sense of feeling the condition of the switch. For this purpose I have connected to the holder an indicator which is specially shaped at one portion and employ in connection with the indicator a shield. The indicator and shield have such a relation that when the switch is closed the peculiarly-shaped portion of the indicator is in position where it can be felt, while when the switch is open this peculiarly-shaped portion is protected by the shield and cannot be felt. By feeling for this peculiarly-shaped portion of the indicator a person can tell by the sense of touch whether or not the switch is on or off. This result may be obtained in a variety of ways, and in the present embodiment of my invention I employ an indicator 41 which is disk-shaped, and which when the cover is on is interlocked with the central support 17 to be rotated therewith. This interlocking of the indicator and central support is secured by the flanges 43 which depend from the indicator and embrace the upper end of the central support. These flanges are insulated from the indicator by being attached to a plate 91 of insulating material, which plate in turn is secured to the indicator. The upper end of the support may have projections 164 on two opposite sides to prevent the indicator from being improperly assembled with reference to the

central support. This indicator is situated directly underneath the top of the cover 40, and may be held in place in the cover when the latter is detached in any suitable way. As herein shown I employ a retaining plate 44 situated directly beneath the indicator 41 to hold the latter in place, and then employ a lining 45 of insulating material for the sides of the cover and the underside of the plate 44. The specially formed portion of the indicator may have a variety of shapes. In the present embodiment of my invention I provide it at certain points with an upturned flange 46, which, as the indicator rotates, travels around in a groove or recess 47 formed in the cover. The recessed or grooved portion of the cover is cut away at one point, as at 48, and the indicator is so shaped that when the switch is "on," the upturned flange registers with the opening 48 so that a person by feeling for the opening can feel said upturned flange. When the switch is open or "off" a portion of the indicator which has no upturned flange and which is smooth stands opposite the opening 48. With my invention therefore a person can feel for the flange 46 and if he detects it situated at the opening 48 then he knows that the switch is "on," while if the flange is absent he knows that the switch is "off." Any other special shape of indicator which is adapted to indicate by the sense of touch whether or not the switch is "on" or "off" may be employed without departing from my invention.

Although I have described herein one embodiment of my invention I do not wish to be limited to the constructional details shown as they may be varied without departing from the invention which is expressed in the appended claims.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a switch, a base provided with an aperture formed with an annular shoulder, a binding post having a shank extending through said aperture and provided with an enlarged end formed by expanding the shank, and a strain-receiving annular member of non-yielding material surrounding the shank and situated between said enlarged end and the shoulder.

2. In a switch, a base having an aperture and a binding post provided with a shank extending through said aperture, said shank having an integral portion thereof expanded to form a flange extending at right angles to the shank, and a strain-receiving washer of non-yielding material surrounding the shank and situated between the flange and the base and having sufficient strength to take the lateral strain resulting from expanding the end of the shank.

3. In a switch, a base having an aperture, a tubular binding post having a shank extending through said aperture, the end of the shank being expanded to form a flange at right angles to the shank which overlies a portion of the base and means to relieve the base from lateral pressure due to expanding the end of the shank.
4. In a switch, a base, a binding post thereon having two separated contact members and a rotary member carrying a connector bar to enter between said contact members, each contact member being divided transversely to the direction of movement of the connector bar to form a plurality of sections which are situated to be engaged successively by the connector bar as it rotates.
5. In a switch, a base, a binding post thereon having two separated contact members, and a rotary member carrying a connector bar to enter between said contact members, each contact member being divided transversely to the direction of movement of the connector bar to form a plurality of independently-yieldable sections arranged to be successively engaged by the connector bar as it rotates.
6. In a switch, a base, a binding post thereon having two separated contact members and a rotary member carrying a connector bar to enter between said contact members, each contact member comprising a plurality of sections arranged in the same plane and situated in line with each other in the direction of movement of the connector bar.
7. In a switch, a binding post having a pair of laterally-extending contact members each composed of a plurality of independently-yieldable sections arranged in the same plane, and a rotary member having a connector bar to enter between said contact members, the sections of each member being situated in line with each other in the direction of movement of the connector bar.
8. In a switch, a non-circular support, a connector-bar carrier surrounding said support, a locking strip interposed between the connector-bar carrier and the support for locking the carrier in place, a connector bar mounted on the carrier and contacts with which said connector bar cooperates.
9. In a switch, a central support, a connector-bar carrier encircling said support and provided with notches on its inner face, a notched locking member interposed between the carrier and the support and received in the notches in the carrier, a connector bar mounted on the carrier and contacts with which said connector bar cooperates.
10. In a switch, a support, a connector-bar carrier surrounding said support, a locking member provided with an arm to overlie each side of the support and operating to hold the carrier in position on the support, a connector bar mounted on the carrier and contacts with which said connector bar cooperates.
11. In a switch, a support, a connector-bar carrier surrounding the support, a locking member having an arm to overlie each side of the support, the carrier having a notch to receive each arm, and each arm being notched to receive the carrier, a connector bar mounted on the carrier and contacts with which said connector bar cooperates.
12. In a switch, a movable contact member, a handle for operating said member, an indicator having its surface of the same character except one portion thereof which is shaped sufficiently differently from the rest to be readily differentiated therefrom by the sense of touch, and a shield arranged to cover said portion of the indicator when the switch is in one position but to leave said portion uncovered when the switch is in another position, one of said parts being operated by a handle and movable with the contact member.
13. In a switch, a movable contact member, a handle for operating said member, an indicator operated by said handle and having the entire surface thereof of the same character except one portion which is sufficiently different from the rest of the surface to be readily distinguished therefrom by the sense of touch, and a fixed shield situated to cover said portion of the indicator when the switch is in one position and to permit said portion to be exposed when the switch is in another position.
14. In a snap switch, a stationary cover having an opening of a size to permit of a person's finger to feel therethrough, and an indicator within the cover, said indicator having its entire surface of the same character with the exception of a specially-formed portion which is adapted to be distinguished readily by the sense of touch, the opening in the cover being situated so that when the switch is in one position said specially-formed portion can be felt therethrough.
15. In a snap switch, a movable contact member, a handle for operating the same, an indicator operated by said handle, said indicator having an upturned flange on one portion thereof, a stationary cover inclosing the indicator and provided with a groove for said flange to travel in, said cover having an opening in position to expose said flange when the switch is in a certain position.
16. In a switch, the combination with a base having an aperture, of a binding post provided with a shank extending through

said aperture and also provided with a non-circular portion, said shank having an integral portion thereof expanded to form a flange to lock the post to the base, and a
5 strain-receiving washer surrounding the shank and situated between the base and the flange, said washer having sufficient strength to resist the pressure thereagainst as the flange is expanded, and a base having a re-
10 cess in its upper face to receive and fit the

non-circular portion of the post whereby the latter is held from turning.

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

STANISLAW A. KOLTONSKI.

Witnesses:

LOUIS C. SMITH,
MARGARET A. DUNN.