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SINGLE POLE MULTIPLE CONTACT SWITCH

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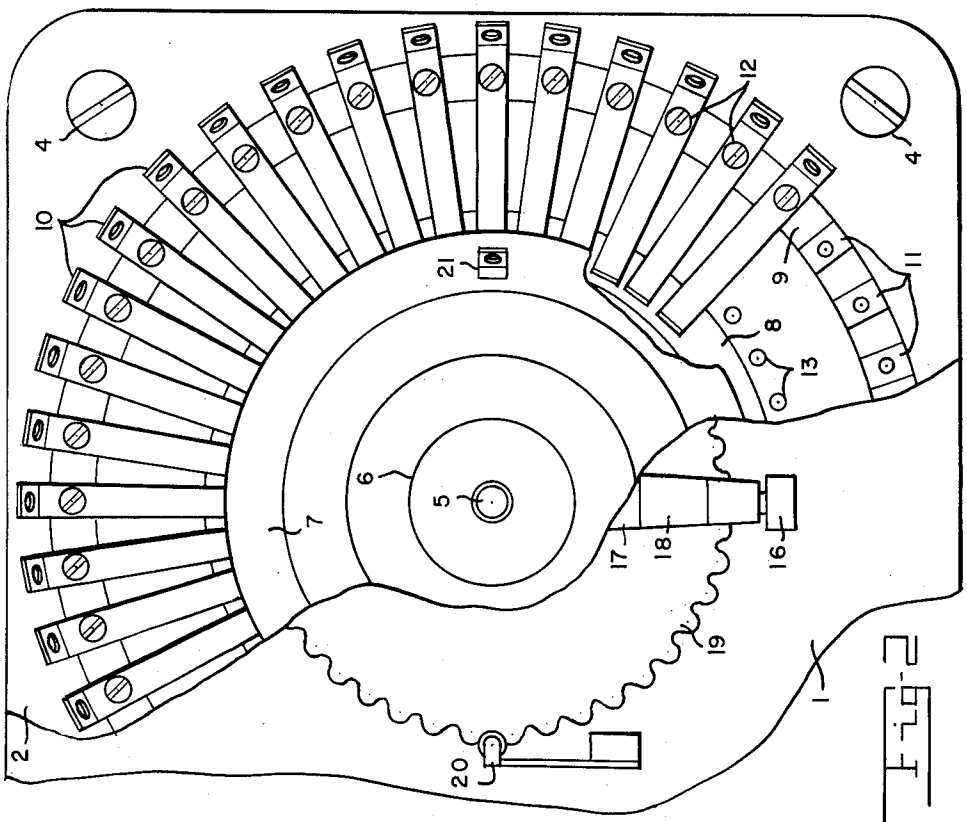


Fig-2

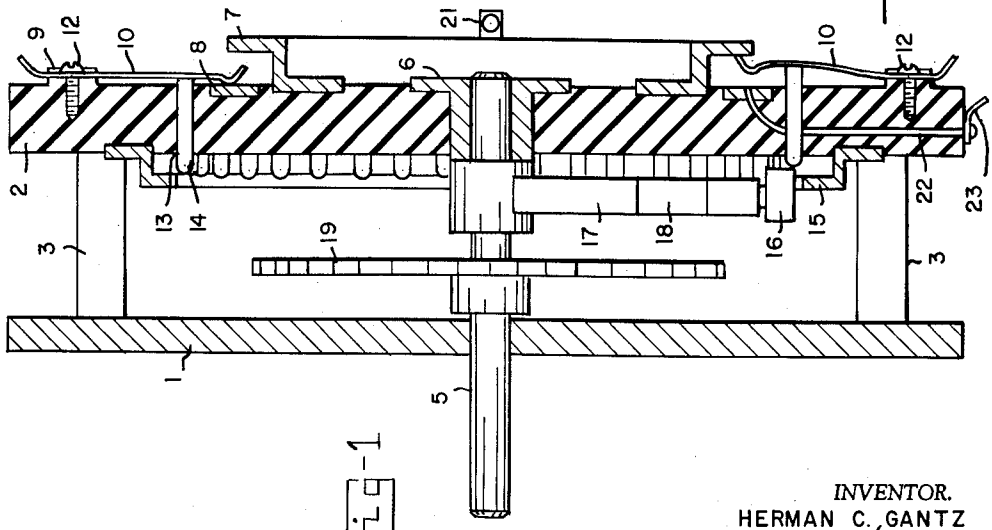


Fig-1

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SINGLE POLE MULTIPLE CONTACT SWITCH

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1 Claim. (Cl. 200—11)
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The invention described herein may be manufactured and used for governmental purposes without the payment of any royalty thereon.

The purpose of this invention is to provide a single pole multiple contact switch that will permit the selective energization of a large number of electrical circuits, one at a time, with provision for grounding all except the energized circuit. The switch has particular utility in the testing of cables and wiring harnesses in aircraft electrical systems, but is not limited thereto. Other objects of the invention are the provision of a switch having relatively high contact pressure and a minimum of contact wear thus insuring good electrical operation over a long period of time.

A more detailed description of the switch will be given with reference to the specific embodiment thereof shown in the accompanying drawing in which:

FIG. 1 is a side view of the switch partly in section; and

FIG. 2 is an end view of the switch partly cut away to reveal inner details.

Referring to the drawing the switch comprises a base plate **1** and a plate **2** of insulating material attached parallel to the base plate by suitable supports **3**. These supports may consist of spacing sleeves with screws **4** passing therethrough and threaded into base plate **1**. A shaft **5** is journaled in base plate **1** and also in insulating plate **2** by means of a metallic bushing **6**. Concentric with shaft **5** are contact ring **7** and ground ring **8**, both supported by the insulating plate **2**. Also concentric with shaft **5** is a raised portion **9** of the insulating plate **2** radially grooved to receive equally spaced spring contact fingers **10**. The contact grooves are best seen at **11** in FIG. 2 where several contacts are removed. The contacts are held in their grooves by screws **12**. The spring fingers **10** normally contact grounding ring **8**.

Situated beneath the contact fingers are a series of holes **13** arranged in a circle concentric with shaft **5** and containing freely slidable plungers **14**. The plungers are retained in plate **2** by plunger retaining ring **15**. Actuation of a plunger toward its associated contact finger **10** moves the finger away from grounding ring **8** and into contact with contact ring **7**. The plungers are actuated by roller **16** carried by arm **17** which is fixed to shaft **5**. The arm **17** may have an insulating section **18** to electrically isolate roller **16** from the remainder of the switch. This purpose may also be accomplished by making the roller of insulating material. The roller may be accurately indexed over the plungers by means of a notched wheel **19**, fixed to shaft **5**, and a detent **20**. By controlling the diameter of roller **16**, make-before-break or break-before-make action of adjacent contacts **10** may be achieved as desired. The

contact fingers **10** at their free ends are bent first toward ring **8** and then in the reverse drection toward ring **7**. This provides added resilience at the ends of the fingers which results in a desirable wiping action between the contact making points on the fingers and the contact rings **7** and **8**.

Contact ring **7** is normally the energized contact of the switch with voltage being applied thereto over any suitable electrical connection such as terminal **21**. Also any suitable means such as connection **22** and terminal **23** may be used to ground ring **8**. When used for cable or harness testing the individual conductors of the cable or harness are connected to contacts **10** and are energized in succession by rotation of shaft **5**. For cyclical operation, with shaft **5** driven at constant speed, the indexing device **19—20** may be omitted. A large number of contacts **10** may be provided by increasing the diameter of the contact **10** ring with a corresponding increase in the diameter of contact **7**. Also a plurality of banks, each like the switch illustrated, may be operated from shaft **5**.

I claim:

A multiple contact single pole switch comprising: an insulating plate; a shaft normal to said plate; a plurality of radial spring contact fingers each attached near one end to said plate and having a free end on a circle concentric with said shaft; a first ring contact, concentric with said shaft; situated on said plate beneath the free ends of said contact fingers and normally contacted thereby; a second ring contact, concentric with said shaft; attached to said plate and situated on the opposite side of said free ends from said first ring contact and normally out of contact with said free ends; a plurality of plungers slidably contained in a plurality of holes through said insulating plate, said holes being centered on a circle concentric with said shaft and each being situated beneath one of said contact fingers between its point of attachment to said plate and its free end; and an arm attached to said shaft and situated on the opposite side of said plate from said contact fingers, said arm having means at its end for engaging a selected one of said plungers depending upon the angular position of said shaft and forcing said plunger against its associated contact finger and thereby said contact finger away from said first ring contact and against said second ring contact; each of said contact fingers at its free end being bent first toward said first ring contact and then in the reverse direction toward said second ring contact to provide added resilience and a resulting wiping action, each of said contact fingers contacting said first ring contact at said reverse bend and said second ring contact at the free end of the contact finger.

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