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HOSPITAL CALL SIGNAL SWITCH

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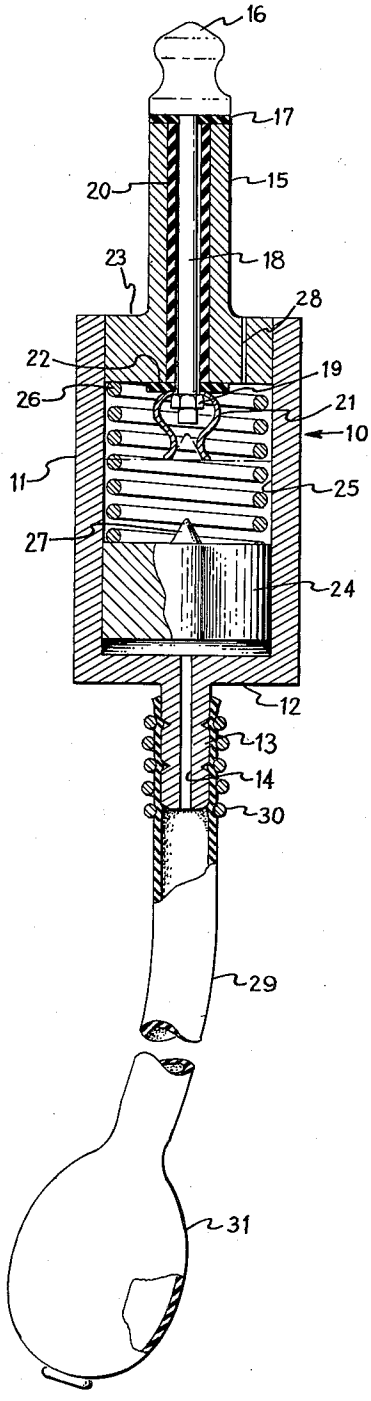

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HOSPITAL CALL SIGNAL SWITCH

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My invention resides in an improved hospital bed, nurse call signal.

Hospital bed, nurse call signals now in general use comprise a switch for the patient's hand, which switch is connected by wires to a plug which is inserted into a jack mounted in a nearby wall. These presently known signal arrangements are subject to failure due to the breaking or disconnection of the wires between the jack and the hand switch. These presently known signal arrangements may not be used in oxygen tents since no electrical contact may be made within such a tent. Furthermore, these presently known hospital call signals are difficult and costly to repair and replace.

Briefly stated, my invention is designed to replace the present call cord consisting of a switch for the patient's hand and connected by wires to a plug which is inserted to a jack mounted in a nearby wall. This I accomplish by using a plug which has built into it a switch which when energized makes the contact heretofore made by the hand-held switch. The combination plug and switch devised by me may be actuated by air pressure created when a slight pressure is exerted on a bulb by the bed patient, suitable tubing connecting this bulb to the combination plug and switch.

An important object of my invention is to provide a hospital call signal which is extremely dependable and which eliminates the possibility of failure due to the breaking or disconnection of wires between a jack and a hand switch.

Another important object of my invention is to provide means whereby a bed patient, who cannot use his fingers for one reason or another, may place a call to the nurse; the signal devised by me can be operated by elbow, knee, foot or other parts of the body.

A very important object of my invention is to provide a hospital call signal which may be used by a patient in an oxygen tent without danger.

A further object of my invention is to provide a hospital call signal which may be simply and rapidly repaired or replaced by any unskilled person and without the need for tools of any kind.

It is also an object of my invention to provide a hospital call signal which can be made operable by a patient located at a greater distance than usual from a wall outlet simply by extending the tube which can be accomplished by the insertion of an extension tube, which any unskilled person may do without tools.

Another object of my invention is to provide a hospital call signal unit which may be made to serve two or more beds by the simple insertion of a T coupling, which can easily be done by an unskilled person without tools.

A primary object of my invention is to provide a means which will contribute to the comfort and safety of hospital bed patients and help to provide better patient care at less cost to the hospital.

These and other objects of my invention will become apparent from an examination of the drawing and the description to follow, all as viewed in the light of the foregoing remarks. In the drawing like numerals are employed to designate like parts. Such drawing comprises a view which is partly in section and having some of the parts broken away.

The combination plug and switch is generally indicated at 10. This combination plug and switch comprises a sleeve 11 having a closed end 12 terminating in a neck 13. An air passage 14 is provided through the neck 13 and sleeve end 12 to the interior of the sleeve 11.

The combination plug and switch also includes an elongated member 15 adapted to be inserted in an ordinary wall jack. The member 15 includes a contact 16 which is maintained out of electrical contact with the member 15 by means of insulation 17. The contact 16 is mounted on a rod 18 which extends through the member 15 and is secured in place by means of a nut 19. Insulation 20 surrounds the rod 18 within the member 15. Also fixed at the lower end of the rod 18 by means of the nut 19 is a pair of contacts 21. These contacts 21 are maintained out of electrical contact with the member 15 by means of additional insulation 22.

The member 15 terminates in an enlarged head 23 which may be secured by press fit in the upper end of the sleeve 11. It will be apparent, therefore, that the parts 15–23 may be assembled as a unit and then incorporated within the sleeve 11.

A piston 24 is slideable within the sleeve 11. For this purpose the interior wall 25 of the sleeve 11 serves as a suitable cylinder in which the piston 24 may slide. A relatively weak resilient spring 26 is placed within the cylinder 25 between the piston 24 and the enlarged head 23 of the member 15 which is pressed within the upper end of sleeve 11. It will be understood by those skilled in the art, however, that other ways of connecting the members 11 and 23, such as by threading these parts, may be employed.

The piston 24 has a tip 27 which is designed to contact and spread apart the contacts 21 when the piston 24 is moved towards these contacts. The tapered tip 27 of the piston 24 when actuated, slightly separates the center insulated contacts 21 whereby to provide a wiping action which removes any dust that may accumulate upon these contacts. This insures positive operation of the device.

The enlarged head 23 of the member 15 has an air exhaust orifice 28 extending therethrough. This enables any air which accumulates between the piston 24 and head 23 to escape when the piston 24 is moved towards the contacts 21.

A resilient, flexible tube 29 is connected to the neck 13 of the combination plug and switch. This tube 29 is attached to the neck 13 by slightly stretching it and slipping it over the neck. Preferably this tube 29 is secured in place on the neck 13 by a combination spring collar 30 which fits snugly over the tube 29 where it is attached to the neck 13 of the plug switch.

The tube 29 terminates in a bulb 31. This bulb 31, therefore, is connected to the combination plug and switch by the tube 29 which may be of any convenient length. Preferably the tube 29 is made of rubber but it will be obvious that other resilient, flexible materials may be employed.

It should be understood that when the members 15 and 16 are inserted within a wall jack, each will make contact with whatever circuit is connected to the wall jack, in known manner. When an electrical contact is established between the members 15 and 16 this circuit will be completed. In the specific application for which I have designed this invention, this means that a nurse call signal will be effected. Such electrical connection between the members 15 and 16 is established as follows.

When the patient squeezes the bulb 31, which may be done by the fingers or by pressure applied by any other part of the body, such as the elbow, knee or foot, the air pressure thus created by this pressure on the bulb 31 causes the piston 34 within the cylinder 25 of the sleeve 11 to travel until the tapered tip 27 engages the contacts 21 on the insulated center shaft or rod 18 having the member 16 affixed thereto. This completes an electrical

contact between the member 16 and the member 15 through the shaft 18, contacts 21, tapered tip 27, piston 24 and sleeve 11. Whatever circuits are connected to the wall jack will thus be actuated.

The coiled spring 26 serves two purposes. When the pressure on the bulb 31 is released by the said patient, the suction thus created will pull the piston 24 away from the contacts 21 and break the circuit within the plug switch. The coiled spring aids the suction to push the piston back. In addition, however, this coiled spring 26 provides additional conductivity between the body of the plug jack (11*a*) and the piston 24.

It is believed that the foregoing constitutes a complete description of the operation of my invention.

It is to be emphasized that one of the chief advantages is that it eliminates any possible electric shock to the bed patient since all circuits are confined to the area of the combination plug and switch which includes the sleeve 11, the member 15 and the other parts which are either enclosed therewithin or connected thereto, excepting only the members 29—31.

Another important feature of this invention is that the unit may easily be sterilized if this is required by hospital procedure.

Furthermore, maintenance costs within the hospital will be reduced since it is no trick to replace the tube 29, for example, whereas without the invention special maintenance personnel are needed to replace wires and the like. In other arrangements, special tools are needed to repair disconnections; in my arrangement all that is required is to slip the tube 29 on the neck 13, which anyone can do.

While my invention is concerned primarily with a momentary contact switch, it is not limited to this alone and may be applied as well to a mechanical locking switch which must be manually released. The invention could also be used for multi-contact released. The invention could also be used for multi-contact arrangements as well. Although the invention is designed primarily to be used with low voltage signal circuits, it could also be used in circuits of higher voltage. And while my invention is designed primarily for use by bed patients in hospitals and nursing homes, it is not limited to this alone.

Thus, it is to be understood that while my invention has been shown and described in a particular embodiment employing certain features and structures, the invention

is not to be limited to this embodiment or to these features and structures except insofar as they are specifically set forth in the subjoined claims.

It will be apparent to those skilled in the art that modifications may be made in the invention without departing from the scope and spirit thereof.

Having thus described my invention, what I claim as new and what I desire to protect by United States Letters Patent is:

1. In a hospital call system including a wall jack in an electrical circuit, the improved call cord which comprises a first electrical contact element, a second electrical contact element disposed coaxially within said first contact element and extending therebeyond, insulation normally preventing electrical contact between said first and second contact elements, a main housing secured to said first contact element and in electrical contact therewith, a contact member within said housing electrically connected to said second contact element, additional insulation normally preventing electrical contact between said contact member and said first contact element, a movable piston in said housing and in electrical contact therewith, said movable piston being normally spaced apart from said contact member within said housing, and remote means for actuating said movable piston, said remote means including a tube connected to said housing on the side of said movable piston away from said contact member within said housing, and a bulb on said tube for forcing air through said tube into said housing, whereby said movable piston is moved into engagement with said contact member within said housing, thereby making electrical contact between said first and second electrical contact elements, and completing the circuit in said wall jack.

2. The call cord of claim 1 including means urging said movable piston out of engagement with said contact member within said housing.

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