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TREADLE SWITCH STRUCTURE

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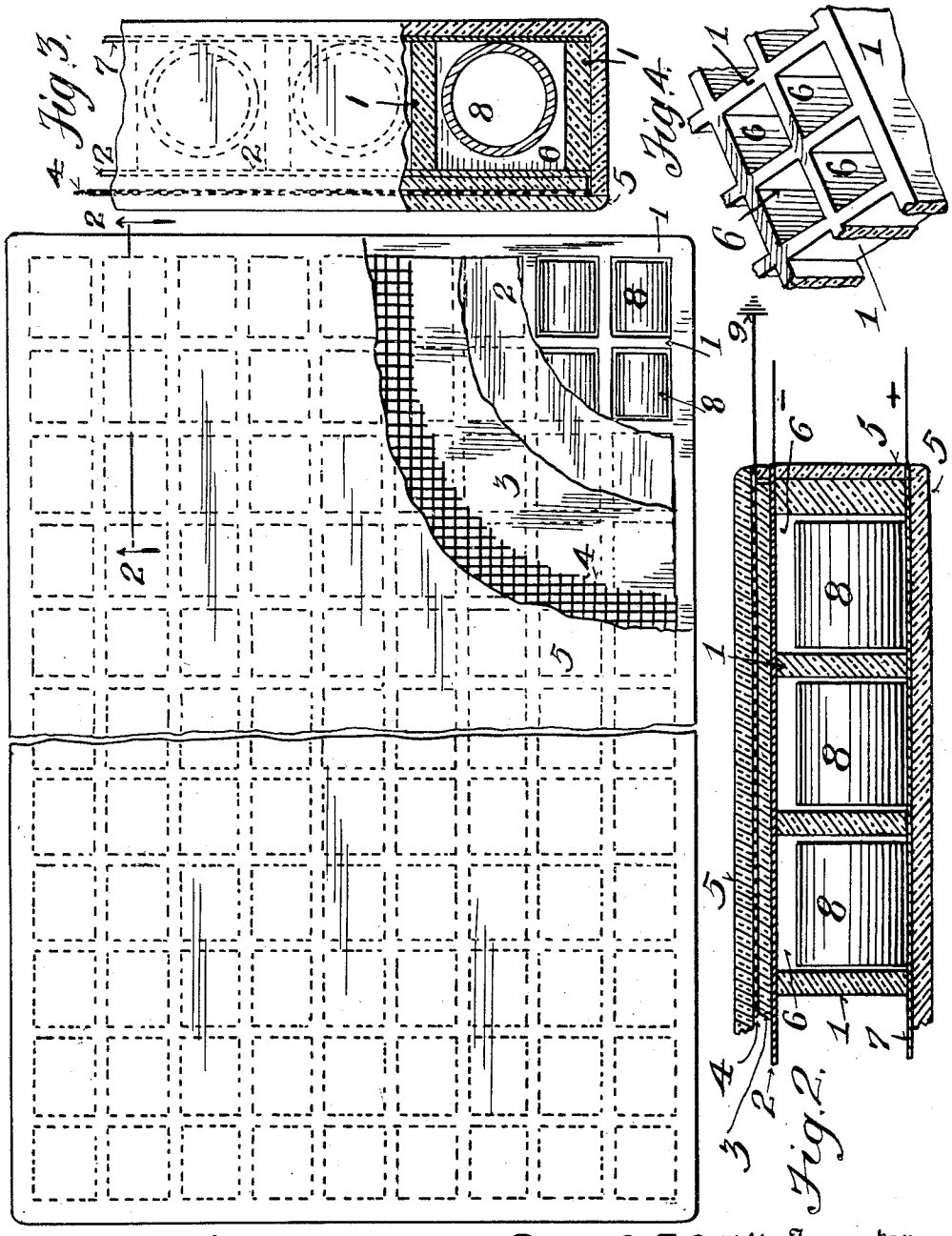


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE

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TREADLE SWITCH STRUCTURE

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This invention relates to improvements in treadle structures.

The object of this invention is to provide a treadle structure which is deformable.

Another object of this invention is to provide a treadle structure which is deformable and which on being deformed under a passenger's weight closes a circuit through contactors structurally disposed in said treadle structure to operate a door actuating engine.

Another object of this invention is to provide a deformable treadle structure which is so arranged that on whichever portion of said treadle structure a passenger may step his weight will operate to close a door actuating circuit.

A still further object of this invention is to provide a treadle structure with a plurality of contactors located therein which are operated under a passenger's weight to close door actuating electrical circuits.

Various other objects and advantages of the invention other than those hereinabove mentioned will be specifically pointed out or will be apparent hereinafter in the course of the below detailed description of the form of the invention shown in the accompanying drawings, as preferred ones of the various possible embodiments of the invention; it being understood, naturally, that such forms are merely illustrative of some of the many possible combinations and arrangements of parts well calculated to attain the objects of the invention and, hence, said detailed description of such form is not to be taken as at all defining or limiting the invention. That is to say, the scope of the invention contemplated is, of course, to be taken from the appended claims, interpreted as broadly as is consistent with the prior art.

This invention resides substantially in the construction, combination, arrangement and relative location of parts, all as will be more fully indicated hereinafter.

Referring to the accompanying drawings embodying a disclosure of my invention:

Figure 1 is a top plan view of one embodiment of the treadle structure with a series of broken away portions at the lower right-hand corner of said figure;

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a portion of an end view of the treadle structure shown in Fig. 1 at the lower right-hand corner where a portion has been broken away;

Fig. 4 is a perspective view of the stamped-out body used in Fig. 1.

Similar reference characters refer to similar parts throughout the several views of the drawings.

In the past it has been the custom in treadle structure design to use a solid, non-deformable treadle structure with a mechanical means arranged to be moved by the motion of the treadle to close and open electrical circuits which operated magnet control valves for railway door engines. One method of closing door operating circuits was to connect a contactor arm to the movable treadle plate and when it moved under the weight of a passenger this contactor arm operated to close an electrical circuit.

The prior art has been replete with various patents and patent applications wherein inventors have conceived of operating door circuits mechanically or electrically but, invariably, in every case, the conception has been to utilize a solid treadle which, when it moved as a unit under the passenger's feet, either actuated levers or itself closed a circuit with some other contact, or, in the alternative, opened pneumatic air lines to supply fluid pressure to a door operating engine. In this invention it is proposed to eliminate the necessity for a movable treadle, that is to say, it is proposed to have a treadle which is, as a whole, fixed in relation to space, but which is deformable so that as a passenger steps onto said treadle the treadle is compressed and there is closed therein the necessary electrical circuit contacts for door actuation. The advantages of this structure over the prior art are multitudinous, among them being the freedom of the treadle from wear and tear due to it being no longer necessary for the treadle to move as a body; the cheapness of manufacture; the ruggedness of construction; the ease of assembly; the simplicity of repair; the longevity of the finished product;

and elimination of movable treadle and hence danger of interruption of usefulness by accumulation of dust thereunder.

Referring specifically to the drawings in Fig. 1, at 1 is shown the general stamped-out structure which goes to make up the treadle body. At 2 is shown a deformable and flexible and brass sheet. At 3 is shown a rubber section interposed on top of said brass sheet. At 4 is shown a wire re-enforcing and electrical grounded screening covering said rubber interposed sheet and electrically grounded at 9. At 5 is shown an over-all rubber casing placed on top of said wire mesh.

The general body structure 1 is obtained by taking a fairly non-deformable rubber plate of the desired thickness and stamping therein a series of parallelopipedal openings extending entirely therethrough shown in Fig. 4 by the numeral 6. The completed rubber plate stamped with the series of parallelopipedal openings is then laid over a thin conducting plate 7, preferably of copper, shown in Fig. 2 and covering it exactly. Into each one of the stamped cavities is then dropped a hollow cylinder 8 of some conducting material, such as brass. The outer diameter of this cylinder being of such a magnitude that it does not quite equal the thickness of the stamped rubber plate. On top of the rubber plate is then laid the flexible brass sheet 2 shown in Figs. 1, 2 and 3, and on top thereof is placed the flexible rubber sheeting 3, the re-enforcing and grounding wire mesh 4, and thereafter the whole structure is covered by the flexible encasing rubber covering 5.

Looking at Fig. 2 the operation of the improved treadle structure will be observed as follows: When a passenger steps upon the flexible rubber casing 5 which encases the whole structure and which operates to insulate and water-proof the enclosed contact members it will be deformed under his weight. The effect of this deformation will be to move downwards at the particular portion of the treadle plate upon which he stands, the elements 5, 4, 3 and 2 and to cause the last of said elements 2 to contact with the hollow conducting cylinders 8 dropped into cavities 6 and which rest upon the copper conducting plate 7. It is thus apparent that the weight of a passenger coming upon the upper face of the treadle will operate to close an electrical circuit from the plate 7 to the flexible brass sheet member 2.

Should a short-circuit occur due to the wearing through of the rubber elements at any portion thereof the potentials existing on the copper or brass plate will be grounded through the wire mesh 4 off to the ground rather than permeating the structure to the feet of a passenger stepping upon the treadle.

It is thus apparent that this structure fixed in relation to space and self deformable will operate upon a passenger's weight to operate any necessary electrical door actuating systems.

Inasmuch as many changes could be made in the above constructions, and many apparently widely different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language contained in the following claims is intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, philologically speaking and as a matter of language, might be said to fall therebetween.

I do not wish to be understood as limiting myself to the exact structure shown or described, except as set forth in the following claims when construed in the light of the prior art.

Having thus described my invention, I claim,

1. A deformable treadle having contained therein a plurality of contactors arranged to contact when said treadle is deformed under a passenger's weight, and a reinforcing grounded conducting mesh work disposed within said treadle over said contactors.

2. A deformable treadle having contained therein a series of pre-stamped cavities, a series of conducting elements similarly located in each of said cavities, each reposing upon a conducting plate, a deformable conducting second plate, a wire re-enforcing grounded mesh separated from said second mentioned conducting plate by an interposed non-conducting sheet and a rubber casing, encasing the whole aforementioned structure.

3. A deformable treadle, comprising a lower rigid conducting plate and a deformable upper conducting plate, an insulating covering for said upper plate, a re-enforcing and grounded wire mesh disposed on said rubber covering, means interposed between said two conducting plates to provide a continuous electrical circuit therebetween when said upper plate is deformed, together with a non-conducting deformable encasing body for said complete structure.

4. The combination of a non-deformable conducting plate, a stamped rubber frame-work, a deformable conducting plate, a deformable rubber insulating sheeting, a wire mesh, a general rubber casing, and means in said rubber frame-work for providing a continuous electrical circuit between said aforementioned conducting plates when deformed.

5. A treadle structure comprising two conducting members in spaced relation, a deformable body between said members having openings therethrough to form cavities, a

contact element in each cavity, a grounded shield supported above and out of contact with said members, and a protecting covering encasing all of said parts.

6. The combination of a non-deformable conducting plate, a deformable treadle framework body having contained therein a series of pre-stamped cavities, a deformable conducting plate, a deformable rubber insulating sheeting, a general rubber casing, and means allocated in said rubber framework to provide a continuous electrical circuit between the conducting plates when the deformable one is deformed.

7. A treadle structure comprising two conducting members in spaced relation, a deformable body interposed between said members having openings therethrough to form cavities, a cylindrical ferrule having a diameter somewhat smaller than the width of said deformable body disposed in each cavity, a grounded shield supported above and out of contact with said members and protecting the covering encasing all of the aforementioned parts.

In testimony whereof I have hereunto set my hand on this 20th day of November, A. D., 1928.

PARIS R. FORMAN.