

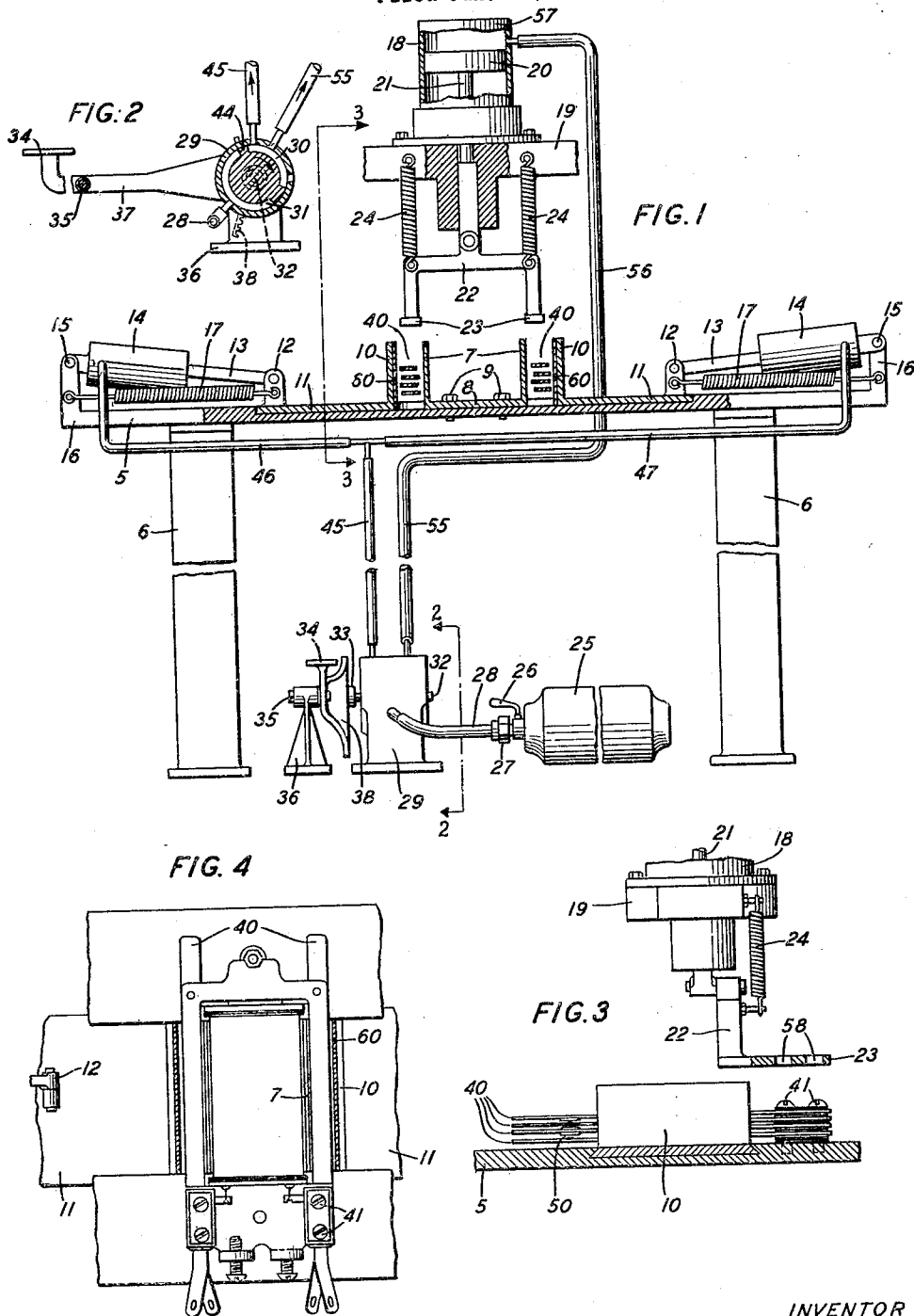
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JIG

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JIG

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This invention relates to jigs and particularly to a jig employed in aligning the contacts of relay contact springs.

With the advent of the use of precious metal as contact material, it is essential that contacts be made as small as possible, consistent with the purpose for which the contacts are employed. The use of relatively small contacts necessitates an accurate alignment thereof in order that oppositely disposed and cooperating contact elements will, under all operating conditions, meet a sufficiently great area of contact to insure perfect electrical engagement.

The use of modern equipment in the manufacture of contact springs for relays and the like has made it possible to accurately locate the contact elements on the spring members relatively to one edge of the spring, but as the width of the springs varies at times within relatively small limits it has been found that when the contact springs are assembled, cooperating contact elements do not line up as accurately as is desired for perfect operating efficiency.

It is accordingly, an object of this invention to provide means for insuring an accurate alignment of the contact elements employed on contact springs prior to the assembly of the pile-up.

This object is attained in accordance with a feature of the invention by the provision of a jig comprising a fixed wall and a movable wall, and means for moving the movable wall in a direction towards the fixed wall. The contact springs are placed loosely in the channel formed by the two walls of the jig and the movable wall is forced against the spring edges, moving the springs into engagement with the flat surface of the fixed wall. A resilient facing for the movable wall is provided to insure the application of pressure to the springs of small width as well as to the wider springs.

Another feature of the invention resides in the provision of means for applying vertical pressure to the spring pile-up after the alignment of the springs has been effected in order to hold the spring elements securely in

position and allow the assembly screws to be drawn up.

The invention will be readily understood from the following detailed description made with reference to the accompanying drawing in which Fig. 1 is a general elevation of the jig embodying the features of the invention and the equipment employed in operating it; Fig. 2 is a view taken along the line 2-2 of Fig. 1 and looking in the direction of the arrows; Fig. 3 is a view of the mechanism employed in applying the vertical pressure to the spring pile-up; Fig. 4 is a top plan view of the jig with the elements of a spring pile-up in position.

A work bench or table 5 of any suitable type is shown supported by the legs, 6, 6. The fixed walls 7 of the jig are shown as integral uprights of the base-plate 8 which is made fast to the table 5 by means of the screw bolts 9. The movable walls 10 are integrally formed with a base member 11, which is slidably secured to the table 5 by means of a dove-tail joint, as clearly shown in Fig. 3.

The slidable element 11 is provided at one end with an upright stationary element 12 to which is pivotally secured one end of a piston rod 13, the piston thereof being contained in the cylinder 14 which is pivotally supported at 15 to a vertical extension 16 of the table 5. A restoring spring 17 has its ends secured to the upright elements 12 and 16 respectively.

Located conveniently above the table 5 is a cylinder 18 which is supported in any suitable manner to a supporting member 19 and in which the piston 20 is adapted to be moved. At the end of the piston rod 21 there is secured a substantially U-shaped operating member 22 which is provided with two horizontally extending pressing members 23. Retractable springs 24 have their ends secured to the rigid mounting member 19 and the U-shaped plunging element 22.

Suitably located beneath the work bench 5 is a compressed air tank 25 provided with a valve 26 and coupling 27 to which a feed hose 28 is secured. The feed hose 28 leads to a two-way valve 29 shown in section Fig. 2.

The valve 29 comprises essentially the

valve heads 30 and 31 keyed in any suitable manner to the shaft 32 to one end of which is secured a pinion gear 33.

A foot treadle 34 is pivotally mounted on the rotatable element 35 which is housed in the floor bracket or support 36. The long arm 37 of the foot treadle 34 has integrally formed therewith at its end an arcuate rack, or geared element 38 which meshes with the pinion gear 33.

The operation of the system disclosed is as follows: a set of contact elements or spring pile-up 40, loosely assembled by means of screws 41, is placed in each of the jig channels formed by the walls 7 and 10, it being understood that normally the movable walls 10 are in their retracted positions due to the action of springs 17. Assuming the valve 26 of the compressed air tank 25 to be in the "supply" position, the foot treadle 34 is moved downwards by foot pressure. Pivoting at 35, the treadle arm 37 moves upwardly causing the rack 38 to rotate the pinion gear 33. The shaft 32 to which the pinion gear is secured thereupon rotates in its bearings causing a corresponding movement of the valve heads 30 and 31. The outlet 44 thereupon comes into alignment with the feed hose 45 permitting a supply of compressed air to traverse the conduits 46 and 47 and impinge on the heads of the pistons contained in the cylinders 14. The piston rods 13 experience the usual outward thrust and push the movable walls 10 up against the spring pile-ups 40. The surface of the stationary walls 7 are machined to present a perfectly smooth face to the edges of the springs constituting the pile-ups 40. The movable walls 10 are faced with a resilient material 60, such as leather, in order that any variation in the width of the springs will not defeat the purpose of the jig. By this means pressure is exerted upon the narrow springs as well as upon the wider ones.

The movement of the walls 10 forces the spring elements flush with the surface of the stationary walls 10 causing them to become perfectly aligned. It follows that since, as hereinbefore stated, the contact elements 50 can be accurately located on the springs with respect to the inner edges, which are the edges now in contiguity with the stationary walls 7, by accurately aligning these edges the associated contact elements 50 will be in accurate alignment.

As the foot treadle 34 is further depressed, the valve head 29 closes the outlet to feed hose 45 and the outlet 44 is advanced to a position opposite to the opening in feed hose 55 permitting a supply of compressed air to traverse the conduit 56 and enter the cylinder 57 to cause a vertical downward movement of the piston 20 and a corresponding outward thrust of the U-shaped compressing element 22.

The feet 23 of the element 22 thereupon engage the upper surface of the spring pile-up and tightly compress the elements thereof. The feet 23 are provided with cylindrical apertures 58 which pass over the heads of the assembly screws 41 and allow a screw driver to be passed through to engage the screws and draw them up to complete the spring assembly.

It will be noted that the cylinders 14 are pivoted at the point 15 to permit a vertical movement thereof, which is experienced when the piston rods 13 are forced outwardly.

Upon return to normal of the foot treadle 34 the retractile springs 17 and 24 restore the movable walls 10 and raise the plunger element 22 permitting the removal of the spring pile-up as a unit, the spring elements of which are in perfect alignment.

It is to be understood that applicant does not intend to be limited to the specific form of operating mechanism disclosed, it being obvious that numerous other methods of actuating the movable walls 10 and plunger element 22 may be resorted to without departing from the spirit or scope of his invention.

What is claimed is:

1. A jig for aligning the elements of a spring pile-up comprising a stationary wall and a laterally movable wall between which the spring elements are placed, a vertically movable member, and means for causing said laterally movable wall and said vertically movable member to be actuated in sequence to effect a rigid alignment of said spring elements against said stationary wall.

2. A jig for aligning the elements of a spring pile-up comprising a stationary wall and a laterally movable wall between which the spring elements are loosely confined, a vertically movable member, means for causing said laterally movable wall and said vertically movable member to be actuated in sequence to produce a lateral and a vertical pressure upon the spring elements and a foot treadle for controlling the sequential operation of said means.

3. A jig for aligning the elements of a spring pile-up comprising a stationary wall and a laterally movable wall between which the spring elements are loosely confined, means for actuating said movable wall to cause the spring elements to be moved laterally and held in alignment against said stationary wall, a vertically movable compressing member, means for actuating said vertically movable compressing member to cause it to engage and compress the spring elements, and means for actuating both said actuating means in sequence.

4. A jig for aligning the elements of a spring pile-up comprising a movable wall and a stationary wall between which the elements of the pile-up are loosely confined, a

compressing member located in superposed
relation to the space confined by said walls, a
foot treadle, means effective upon the actua-
tion of said foot treadle for causing the mov-
5 able wall to approach the stationary wall to
exert a lateral pressure upon the elements
confined therebetween and for moving said
compressing member vertically between said
walls to exert a pressure upon the elements
10 confined therebetween, and means effective
upon the release of said foot treadle for re-
storing said movable wall and said com-
pressing member to their normal positions.

In witness whereof, I hereunto subscribe
15 my name this 13th day of June, 1930.

GEORGE W. BURR.

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