June 21, 1955 E. BEAVER 2,711,524

ELECTRICAL CONTACT

Filed Oct. 8, 1952

Fig. 1.

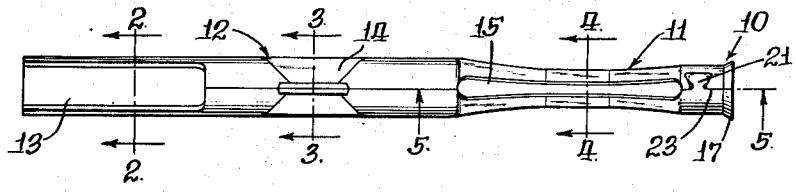


Fig. 2.

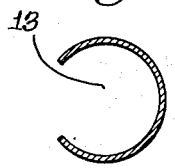


Fig. 3.

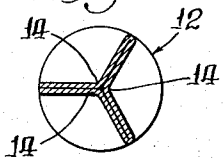


Fig. 4.

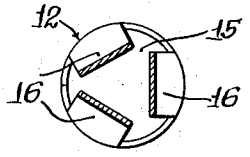
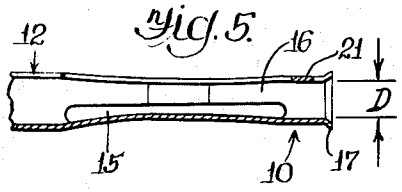


Fig. 5.



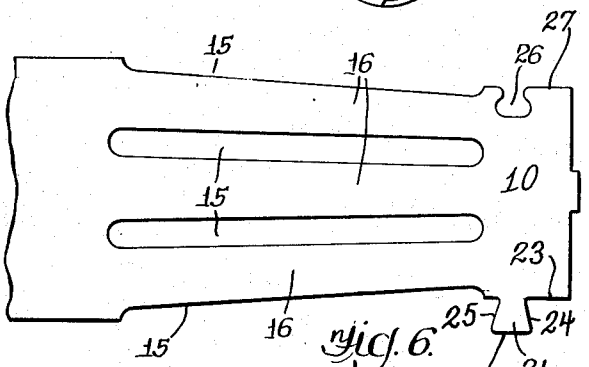


Fig. 6.

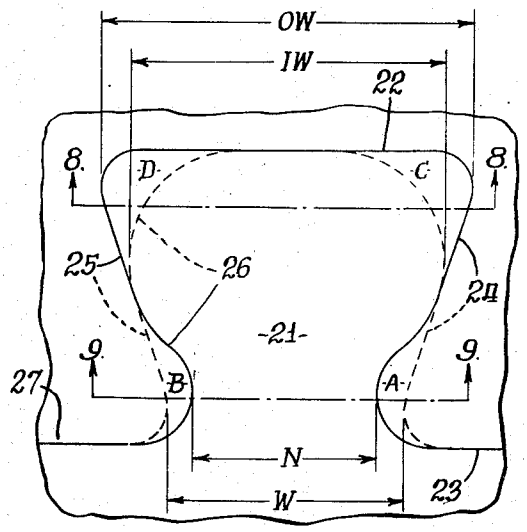


Fig. 7.

Fig. 8.

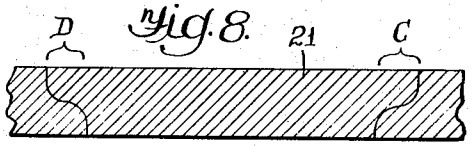
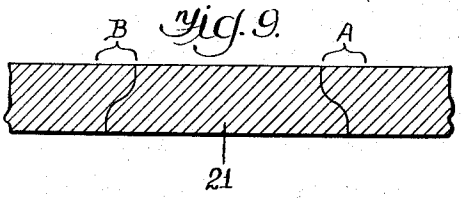


Fig. 9.



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ELECTRICAL CONTACT

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3 Claims. (Cl. 339—256)

This invention relates to contacts for electrical connectors and has specific reference to a female contact of novel design and construction whereby some of the most troublesome faults of telescoping contacts employed in the prior art are overcome. It is a primary aim of the invention to accomplish these desirable results by a simplified structure, which is both economical to manufacture and dependable in use.

It is a more specific object of the invention to provide an improved contact having resilient spring fingers adapted to slidably engage a contact pin inserted therein, together with means to prevent damaging the contact by abnormal flexing of the spring portions upon insertion of oversize contact pins. This is accomplished according to the present invention by the provision of a contact in the form of a split sleeve, with a neck or aperture of fixed diameter, and provided with positive means to prevent spreading. With this arrangement, the contact will not accept contact pins sufficiently oversize as to damage the spring elements thereof.

According to the present teachings, the neck of the contact is prevented from spreading by interlocking the relatively thin edges of the split sleeve with a unique fastening or joint, which comprises a form of mortise and tenon particularly useful in this specific application, and so designed as to hold the mortise and tenon flush with each other and thus effectively prevent their disengagement, even when the coacting parts are formed of very thin sheet metal, as in the present disclosure.

The preferred embodiment of the invention is illustrated in the drawings attached hereto, wherein:

Figure 1 is an enlarged elevational view of an electrical contact constructed in accordance with this invention;

Figures 2, 3 and 4 are detail sectional views taken on the planes of the lines **2—2**, **3—3** and **4—4**, respectively;

Figure 5 is an enlarged fragmental sectional view of the forward end of the contact, the view being taken substantially on the plane of the line **5—5** of Figure 1;

Figure 6 is an enlarged fragmental plan view of the blank from which the contact is formed;

Figure 7 is a greatly enlarged detail plan view of the dovetail joint interconnecting the opposite edges of the contact at the neck portion thereof;

Figure 8 is a detail sectional view taken substantially on the plane of the line **8—8** of Figure 7; and

Figure 9 is a detail sectional view taken substantially on the plane of the line **9—9** of Figure 7.

The entire contact is formed of a single sheet metal stamping, cut and formed to provide a tubular forward portion or neck **10** of fixed diameter, behind which a plurality of sheet metal spring fingers **11** are arranged to accomplish a resilient electrical connection with a contact pin inserted through the neck. A mounting portion **12** is provided to secure the contact within the dielectric insert of an electrical connector, and the end of the contact opposite the neck **10** is provided with an open sided solder pocket **13** as is conventional in the art. As shown, the mounting portion is inwardly crimped at the points **14** to provide means for anchoring the contact in the insert of the connector, as well as to close the inside end of the solder pocket.

The forward end of the contact is shown in enlarged view in Figure 5, where it will be seen that the metal is cut away along parallel longitudinal slots **15** so as to form three angularly disposed spring contact fingers **16** extending between the mounting portion **12** and the neck portion **10** of the contact.

The extreme end of the neck portion **10** may be slightly flared at **17**, if desired, and is arranged to receive a round contact pin having a diameter not greater than the diameter D indicated in Figure 5. The spring fingers **16** of the contact are imparted with a permanent set such that they will bear inwardly against such a contact pin with adequate force to establish a firm electrical contact therewith, but since the neck of the contact limits the size of pin to be inserted, the fingers **16** cannot be flexed to the point of permanent distortion by inserting or attempting to insert an oversize contact pin into the connector. It follows that the resiliency of the fingers cannot be impaired by normal use.

The manner in which the opposite edges of the neck portion **10** of the contact are interlocked with each other is one of the features of novelty of this invention and is illustrated in detail in Figures 7, 8 and 9. In these figures it will be seen that the connection is accomplished by a peculiar dovetail or mortise and tenon joint wherein the interconnecting parts of the joint are not cut to fit each other as is conventional practice, but are so cut that two of the edges of each part overlap the other, with the outer corners of the dovetail tenon overlapping the mortise, and with tabs at the neck of the mortise overlapping the tenon. This structure results in a unique interlock which prevents the tenon from slipping out of the mortise even when the metal is so flattened that it is reduced to the thickness of a single sheet as it is forced into final shape by the forming dies employed in manufacturing the contact.

It will be seen, for example, that the dovetail **21** is of generally trapezoidal form having a straight end **22** parallel with the edge **23**, and with angularly divergent side edges **24** and **25**. The mortise **26** in the opposite edge **27** of the metal is somewhat more circular in shape, having an inside width IW somewhat less than the outside width OW of the dovetail **21**, and with a neck portion N of considerably less width than the width W at the inner end of the dovetail **21**. Thus, while the opposite interconnecting parts of this joint do not fit each other in the strict sense of the word, yet they may be forced together, and when this is done the flattening of the two halves of the joint into the same plane will cause the neck of the mortise to overlie the dovetail in the areas A and B, while the outer corners of the dovetail will overlie the mortise opening in the areas C and D. Thus, when the metal surfaces are forced flush, the oppositely disposed overlapping edges in these areas serve to effectively interlock the dovetail in the mortise and hold the surfaces of the dovetail and mortise flush with each other, so that they cannot be released by any strain insufficient to rupture the metal.

By this arrangement the present invention provides an improved contact, formed of a single split sleeve but having a pin aperture of fixed dimensions which is not subject to spreading, notwithstanding the fact that the neck itself is formed of split sleeve construction. Moreover, this is accomplished without any encircling rings, collars or reinforcements which add to the expense and increase the complications of manufacture.

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

1. An electrical contact consisting of a single integral

metallic sheet in generally tubular form, with a mounting portion, a neck portion, and a plurality of longitudinal slots between the mounting portion and the neck defining a plurality of separate spring fingers angularly disposed with respect to each other and extending longitudinally of the contact, with the neck comprising a split sleeve with opposite edges secured to each other by a mortise and tenon wherein the tenon consists of a thin metal dovetail integral with and projecting from one edge of the split sleeve, and the mortise consists of an undercut notch in the opposite edge thereof, with a portion of the dovetail of greater width than the mortise and with a portion of the mortise of lesser width than the dovetail, and with at least one of the edges of the dovetail and at least one of the edges of the mortise overlying the other on their opposite surfaces.

2. An electrical contact having a neck comprising a split sleeve with opposite edges secured to each other by a mortise and tenon wherein the tenon consists of a thin metal dovetail integral with and projecting from one edge of the split sleeve, and the mortise consists of an undercut notch in the opposite edge thereof, with a portion of the dovetail of greater width than the mortise and with a portion of the mortise of lesser width than

the dovetail, and with at least one of the edges of the dovetail and at least one of the edges of the mortise overlying the other on their opposite surfaces.

3. An electrical contact consisting of a single integral metallic sheet in generally tubular form, with a mounting portion, a neck portion, and a plurality of longitudinal slots between the mounting portion and the neck defining a plurality of separate spring fingers angularly disposed with respect to each other and extending longitudinally of the contact, with the neck comprising a split sleeve with opposite edges secured to each other by a mortise of generally circular shape and a tenon of trapezoidal, dovetail shape wherein at least one tab adjacent the neck of the mortise overlies the tenon on one surface thereof, and at least one outer corner of the tenon overlies the mortise on the opposite surface.

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