Sept. 5, 1944. O. C. MOLL 2,357,755

CONDUIT FITTINGS

Filed Sept. 26, 1941

Fig. 1

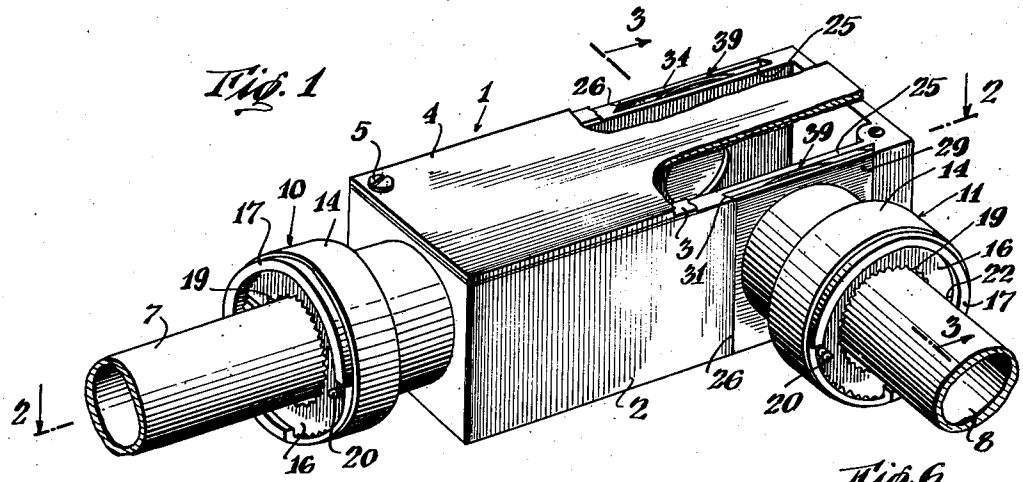


Fig. 2

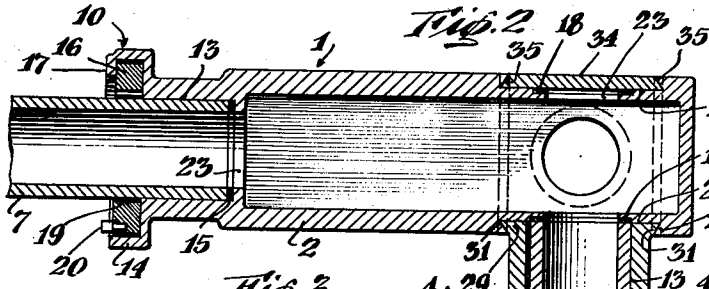


Fig. 6

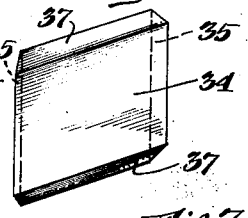


Fig. 3

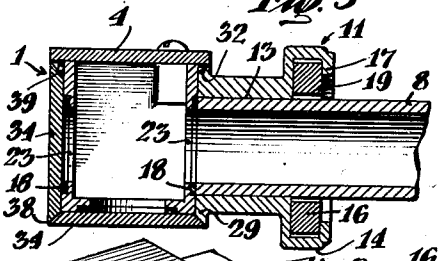


Fig. 7

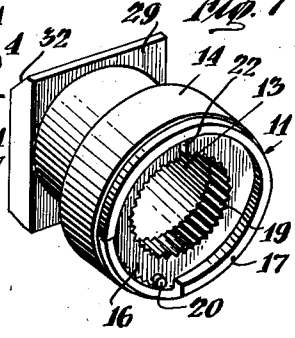


Fig. 8

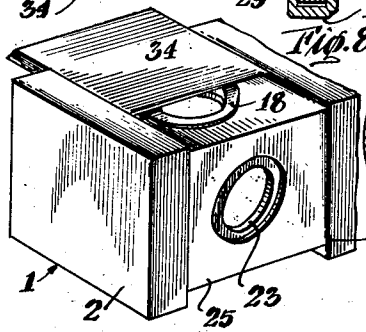


Fig. 4

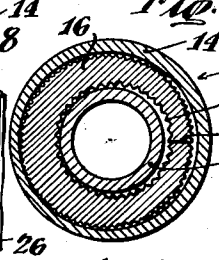


Fig. 5

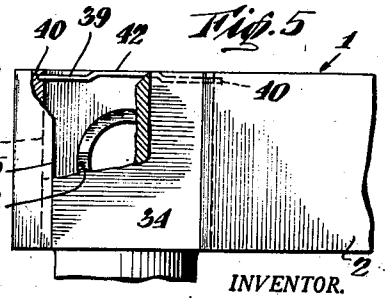
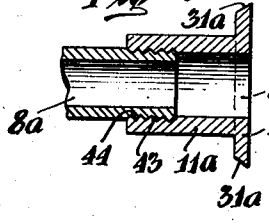


Fig. 9



Fig. 10



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UNITED STATES PATENT OFFICE

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CONDUIT FITTING

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Application September 26, 1941, Serial No. 412,404

12 Claims. (Cl. 220—3.94)

The present invention relates to electrical wiring and more particularly to a connector or fitting adapted to be used with wiring conduits.

In the installation of electrical wiring in buildings and other structures it is necessary that the wires run through conduits. This is to accord with fire underwriters' requirements in minimizing fire hazards. Whenever certain types of wire conduits have to turn a corner a connector is used which encloses the ends of the conduits and the wires which project therefrom. In most instances the wires and conduits are obliged to turn corners which lie substantially at right angles to the direction of the original conduit. In order to take care of such right angle bends three general types of connectors or junction boxes are in general use at the present time The three connectors differ primarily in the position of the outlet at one end with respect to the cover part thereof and are usually known as "LL," "LB" and "LR"; "LL" being a connector with an outlet at the left, "LB" a connector with an outlet at the back and "LR" a connector with an outlet at the right. Frequently an electrician will require several of a single type of connector on a relatively small job. Hence, it is necessary that he have in his kit a number of each type. In the event that he does not have available the type required, he must stop and get it. Since connectors are relatively heavy, the electrician is inclined to take the minimum number deemed necessary. Hence he frequently runs short of one type, where more than the estimated number of the particular type is required. On the other hand, he may have an excess number of the other two types of connectors. The difficulty is that the number of connectors which the electrician is required to carry by reason of the different types required is so burdensome that he will endeavor to get by with a minimum number of each. The same situation exists in stores, parts departments, and other places where such fitments are dispensed.

The present invention aims to overcome the above and other difficulties by providing a new and improved connector, fitment or junction box, which may be used for any one of the three types of connectors, "LL," "LB" and "LR," now generally in use. In addition, a connector may be readily added to an existing installation of the present invention without installing a new fitment or box by substituting a connector for one of the cover members. An electrician may therefore carry fewer connectors in his kit as each connector will take care of any outlet desired. The invention aims to accomplish this by a simple construction, which may be manufactured at a low cost and which may be readily installed.

An object of the present invention is to provide a new and improved connector for electric conduits.

Another object of the present invention is to provide a connector having a conduit coupling which may be retained in any one of several positions with respect to the cover thereof.

Another object of the present invention is to provide new and improved means for retaining a conduit coupling member in position.

Another object of the present invention is to provide a connector which may be inexpensively manufactured and sold.

Another object of the present invention is to provide a connector which is substantially watertight, weather-proof and explosion-proof.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification, wherein

Fig. 1 is a perspective view illustrating a preferred embodiment of the present invention.

Fig. 2 is a sectional view along the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 2.

Fig. 5 is a fragmentary side view, partly broken away, illustrating a preferred form of holding means.

Fig. 6 is a perspective view of a preferred form of closure or slide member.

Fig. 7 is a perspective view of a preferred form of conduit coupling.

Fig. 8 is a perspective view, partly broken away, of a cover member being inserted into a slot over a sealing gasket or washer.

Fig. 9 is a fragmentary sectional view illustrating a modified form of gasket or washer positioned in a connector.

Fig. 10 is a sectional view illustrating a modified form of conduit coupling.

Referring again to the drawing, and more par-

ticularly to Figs. 1 to 4 thereof, there is shown a connector or junction box 1 comprising a box-like body portion 2 having a cover member 4 secured thereto by screws 5. A conduit 7, adapted to contain wires (not shown), may be secured to the connector or junction box at one end thereof and a second conduit 8 may be secured to it adjacent the opposite end thereof. It will be noted that the conduits 7 and 8 lie substantially at right angles to each other for the purpose of forming a right angle bend. The wires (not shown) which pass through the conduits may be joined, soldered and taped at the interior of the body portion 2.

The conduits 7 and 8 are secured to the connector by means of suitable conduit couplings 10 and 11. The construction and operation of the coupling mechanism of each of these conduit couplings is the same. The coupling 10 is preferably formed integrally with the body portion 2 of the connector. Each of the couplings has an internal bore 13 adapted to receive a conduit. Adjacent the outer end of the coupling is an enlarged collar portion 14 which contains an annular member 16 having an eccentrically positioned opening with ratchet teeth 19 extending about the inner periphery thereof. Preferably ratchet teeth or a slightly roughened surface is also provided about the outer periphery of the annular member 16. The annular member 16 may be retained within the enlarged collar 14 by an inwardly extending flange 17 at the outer edge of the collar 14. When the bore of the annular member 16 lies in alignment with the bore 13 of the conduit coupling the opening is sufficient to permit insertion of a conduit pipe. The pipe is preferably inserted into the coupling so that its free end abuts against a gasket or washer 15 at the lower part of the inner bore 13; thereafter the annular member 16 may be rotated by means of a pin 20 so that the eccentric bore in the annular member 16 moves out of alignment with the bore 13. This offsetting of the bores with respect to each other reduces the space available for the conduit and rigidly clamps the pipe in position. The pipe may also be clamped in position by inserting the pipe as described and then rotating it to move the two bores out of alignment, instead of by shifting the annular member through the pin 20. The more the conduit is turned the tighter it will be clamped in position. If desired, the annular member 16 may be split at one side 22 thereof to facilitate manufacture thereof and to enhance the frictional grip provided thereby. The ratchet teeth or slight roughening at the outer periphery of the annular member 16 is not essential but its use minimizes the possibility of the annular member accidentally shifting or loosening so as to release the grip on the conduit. The conduit coupling at the left in Figs. 1 and 2 is preferably integrally mounted in the connector or junction box; for purposes of description this particular conduit coupling will be hereinafter referred to as the "inlet" conduit. It is to be understood that either coupling may be used as an inlet or an outlet and that the two terms are used interchangeably herein. The conduit coupling 11 which performs the function of an outlet from the connector is not integrally mounted with the connector but may be secured in any one of three positions on the connector so that conduits and wires may lead outwardly from the connector in any one of these three directions.

Apertures 23 are provided in each of the three sides of the body portion 2 of the connector, through which may pass electric wires. Preferably each of these apertures is surrounded by a countersunk recess adapted to receive a washer or gasket 18 for a purpose which will be hereinafter described. Slots 25 having undercut edges 26 extend entirely across the width of each of the three sides of the body portion 2 of the junction box so that the apertures 23 lie intermediate the sides of the slots 25. These slots lie substantially in line with each other and form, in effect, a continuous slot which extends along one side of the box, across the back thereof, and thence up the other side of the box. The washers which extend about the apertures 23 project upwardly a short distance into the slots 25.

The outlet conduit coupling, which is constructed and operates similarly to the inlet conduit coupling hereinabove described, is secured to an enlarged base portion 29 which has downwardly sloping or bevelled side portions 31 and upwardly sloping or bevelled end portions 32. The bevelled side portions 31 are adapted to fit into any one of the slots which extend along the three sides of the connector and overlie, in effect, the apertures 23 formed in the body portion 2 of the junction box or connector. That is, the outward flare 31 on the enlarged base portion 29 of the conduit coupling 11 dovetails into the undercut side portions 26 of the slots. The enlarged base portion of the coupling 11 may thus be readily slid into and out of any one of the slots but it cannot be pulled directly out of a slot. The length of the enlarged base of the coupling 11 is substantially equal to the width of the sides of the body portion 2 of the connector and when the enlarged base portion is inserted completely into a slot of the body portion 2 an aperture 23 in the body portion lies in alignment with the apertrures in the conduit coupling. In this relation wires may readily be passed into and through the conduit coupling and a conduit connected with the coupling. The conduit which passes into the conduit coupling 11 preferably presses firmly against a washer 18 maintained in a recess about an aperture 23 and forms a tight joint.

The purpose of the oppositely bevelled underportions 32 on the enlarged base 29 of the conduit coupling 11 will be hereinafter described. The adjustable conduit coupling 11 may be inserted into any one of the three slots of the connector so that wires may proceed in any one of three directions from it. Since in most cases only one outlet conduit coupling will be used at a time, it is necessary to provide means for covering the remaining two apertures 23 in the body portion 2. Cover members 34 are therefore preferably provided for each connector or junction box. Each of these cover members 34 has its side portions 35 bevelled similarly to the enlarged base portion of the conduit coupling so that it may fit into and form a dovetailed joint with a slot in the body portion 2. The end portions 37 of these cover members are preferably bevelled oppositely to the side bevels 35 similarly to the enlarged base portion of the conduit coupling 11. When the conduit coupling 11 and the pair of cover members 34 are each inserted in the proper slots in the body portion 2, the respective bevelled underportions 32 and 37 thereof will fit closely together, as indicated at 38 in Fig. 3 to form smooth joints. Each of the cover members 34 will press tightly against the washers 18 that extend about the apertures 23 in the body portion 2 and will form fluid-tight seals therewith.

When the adjustable conduit coupling 11 and the cover members 34 are in the slots the downwardly bevelled edges 31 and 35 thereof cooperate with the undercut slot edges 26 to hold each of the members in position and the oppositely bevelled under-portions 32 and 37 thereof abut each other (Fig. 3) to cooperate in holding the members in the slots. As a further safeguard for holding these members in the slots, members 39 (Figs. 1 and 5) are provided. These members are effective when the cover is off the box to prevent the cover parts and the connector from sliding out accidentally while the fitment is being handled. Any suitable device for holding the cover parts 34 in position may be utilized. As illustrated herein, spring members 39 which may be made from spring steel are snapped into recesses 40 after the adjustable coupling 11 and covering members 34 are in position. An upward projecting loop 42 may be provided on each of the members 39 to facilitate insertion of a screwdriver or implement for ready removal, thereby to facilitate changing the coupling from one position to another with respect to the cover.

After the desired electrical wiring connections have been made within the body portion 2 of a connector, the cover portion 4 may be screwed downwardly firmly against a gasket 3 which extends about the body portion 2. The cover member 4 for the body portion 2 preferably extends over the ends of adjacent slots and further minimizes the possibility of a cover member 34 or the adjustable conduit coupling 11 sliding out of its holding slot.

The gasket 3 is preferably adhesively secured to the upper edge of the body portion 2 of the connector. When the screws 5 are tightened, the cover member is pulled firmly against the gasket and forms a tight seal therewith. The gasket or washer 15 forms a tight joint with the end of the inlet conduit 7 and the gaskets or washers 18 extending about the outlet apertures 23 form tight fits with the cover members 34 and outlet conduit 8. Thus every opening in the body portion 2 is tightly sealed by means of gaskets or washers so that when the box is installed ready for use it will be waterproof, weatherproof and explosion proof. The latter feature is particularly desirable in such places as chemical plants or those having to do with the manufacture of explosives for any open wiring or connections which might give off a spark would be extremely hazardous in these instances. Preferably each of the washers 15 and 18 is adhesively secured in place so that it will be in operative position at all times.

In Fig. 9 there is illustrated a modified form of gasket or washer 18*a* which is adapted to snap into position over adjacent edges of an aperture 23 or other opening. The gasket 18*a* is provided with a recess 30 which extends entirely about the outer margin or periphery thereof, and fits over the edge of an opening so that the flange portions 33 and 36 on each side of the gasket extend over the upper and lower adjacent sides of an opening 23. The gasket thus firmly clamps into position and adhesive is unnecessary, but may be used if desired. This form of gasket is also adapted to form fluid tight seals at all points of entrance to and exit from the connector.

In Fig. 10 there is illustrated a modified form of coupling conduit 11*a* which may be used in the connector. This modified form of connector is provided with an internal screw thread 43 adjacent the mouth thereof into which is adapted to be screwed the threaded end 44 of a conduit 8*a*. The modified form of coupling has an enlarged base portion 29*a* provided with outwardly bevelled side edges 31*a* and undercut end edges 32*a* and is adapted to fit into a slot of the connector and operate similarly to the preferred embodiment. The cooperating threads 43 and 44 of the modified form of conduit coupling and the conduit may be coated with paint or some other compound which is adapted to form a fluid tight seal at this point. While this form of coupling requires the formation of a thread on a conduit 8*a*, it may be desired in some instances instead of the preferred embodiment.

It will be seen that the present invention provides a new and improved connector that may be easily and rapidly installed. The single connector serves the functions of three different types of connectors formerly in use and eliminates the necessity of an electrician carrying several of each type in his kit. The outlet coupling and cover plates or members may be readily inserted in desired position in the connector and securely locked therein against movement in any direction. No clamping screws or complicated locking means are required to hold these elements in position. In addition, the gaskets or washers facilitate the making of fluid-tight seals so that neither water nor explosive gases can leak into the connector.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the scope and spirit of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. A multi-side connector having a plurality of apertures therein on different sides thereof and having slots with undercut side portions in proximity to certain of said apertures, each of said slots having an end terminating at a corner of the connector, a conduit coupling having a base portion adapted to be selectively positioned in said slots and to extend outwardly beneath the undercut side portions thereof so that the conduit coupling lies substantially in alignment with the apertures of the connection box, and closure members adapted to be inserted into the others of said slots and to extend outwardly beneath the undercut side portions thereof to cover the apertures located in proximity thereto.

2. A connector having a plurality of sides at angles to each other, certain of said sides having apertures therein and having slots in proximity to said apertures, each of said slots having an end meeting an end of a slot on an adjacent side at a corner of the connector, a conduit coupling having a base portion adapted to be selectively positioned in said slots so that the conduit coupling lies substantially in alignment with the apertures of the connection box, closure members adapted to be inserted into the others of said slots to cover the apertures located in proximity thereto, and means for normally retaining said conduit coupling and closure members in assembled relation with the body portion.

3. A connector of the class described, comprising, in combination, a body portion having a plurality of sides at angles to each other, certain of said sides having apertures therein, sealing means extending about each of said apertures, said sides also having slots with undercut side portions in proximity to each of said apertures, each of said slots having an end meeting an end of a slot on

an adjacent side at a corner of the connector, a conduit coupling having an enlarged base portion adapted to be selectively positioned in said undercut slots to hold said coupling in alignment with an aperture and against the sealing means extending about the aperture, and a plurality of closure members adapted to be inserted into said other slots to cover the apertures located in proximity thereto and to form a relatively tight seal with the sealing means extending about said apertures.

4. A connector of the class described comprising, in combination, a body portion having a conduit coupling secured thereto and having a plurality of apertures at three different sides of said connector, sealing means extending about each of said apertures, said connector also having a slot with undercut side portions in proximity to each of said apertures, a second conduit coupling having an enlarged base portion adapted to be selectively positioned in said undercut slots to hold said coupling in alignment with an aperture and against the sealing means extending about the aperture, a plurality of closure members adapted to be inserted into the others of said slots to cover the apertures located in proximity thereto and to form a relatively tight seal with the sealing means extending about said apertures, and resilient means for normally retaining said second conduit coupling and closure members in assembled relation with the connector.

5. A connector of the class described comprising, in combination, a body portion having a conduit coupling secured thereto adjacent one end thereof and having a plurality of sides at an angle to each other and a plurality of apertures in said sides, aligned undercut slots in the sides of the connector forming holding means therein, a second conduit coupling adapted to be selectively connected with any one of said apertures by said holding means, members adapted to fit in said slots to close said other apertures and sealing means extending about each of said apertures adapted to prevent leakage of fluid through the apertures when the connector is in use.

6. A conduit fitting for making electrical connections having a plurality of apertures therein at different sides thereof and having a slot in proximity to each of said apertures, an annular washer member having an annular recess at the outer periphery thereof fitting about the edges of each of said apertures and maintaining the washers in position in said apertures, a conduit coupling having a base portion adapted to be selectively positioned in any one of said slots so that an opening in the conduit coupling lies substantially in alignment with an aperture of the conduit fitting, and closure members adapted to be inserted into the others of said slots to cover the apertures located in proximity thereto and to retain the base portion of the conduit coupling in position.

7. A conduit fitting for making electrical connections, comprising, in combination, a body portion having a coupling secured thereto adjacent one end thereof and having apertures adjacent the other end thereof at three different sides of said fitting, sealing means extending about each of said apertures, said fitting also having a slot with undercut side portions in proximity to each of said apertures and at the same side of said fitting as each of said apertures, a second coupling having an enlarged base portion adapted to be selectively positioned in any one of said undercut slots to hold said coupling in alignment with an aperture and against the sealing means extending about the aperture, and a pair of closure members adapted to be inserted into said other slots to cover the apertures located in proximity thereto and to form a relatively tight seal with the sealing means extending about said apertures, said closure members and the enlarged base of said coupling cooperating to hold each other in position.

8. A conduit fitting of the class described comprising, in combination, a body portion having a coupling secured thereto adjacent one end thereof and having apertures adjacent the other end thereof at three different sides of said fitting, sealing means extending about each of said apertures, said fitting also having a slot with undercut side portions in proximity to each of said apertures, a second coupling having an enlarged base portion with bevelled edges adapted to be selectively slid into and out of said undercut slots to hold said coupling in alignment with an aperture and against the sealing means extending about the aperture, a pair of closure members having bevelled edges adapted to be inserted into the others of said undercut slots to cover the apertures located in proximity thereto and to form a relatively tight seal with the sealing means extending about said apertures, a pair of resilient members normally fitting over the free edges of said second coupling or closure members to retain said second coupling and closure members in assembled relation with the fitting.

9. In a connector of the class described, the combination of a body portion having a plurality of sides at angles to each other, said sides having spaced grooves terminating at the corners of the body portion, said spaced grooves in one side having their ends in substantially the same transverse plane as corresponding spaced grooves in an adjacent side of said connector, and closure members adapted to fit in said grooves and substantially to abut each other at a corner of the body portion.

10. A connector adapted to be used for electrical wiring, comprising in combination a body part having a plurality of sides at an angle to each other, an open side adapted to be closed by a removable cover, said sides having substantially parallel undercut grooves, a connector having a holding member adapted selectively to fit into certain of said grooves and to leave other grooves available for a closure, a closure member adapted to fit in other grooves, said grooves terminating at the corners of the body part, whereby the holding member for the connector may be readily secured in the grooves and may be held in position by the removable cover of the box and by a closure fitting in grooves in an adjacent side.

11. A connector adapted to be used for electrical wiring comprising a box-like body part having an open side for the attachment of a removable cover, openings in certain of the sides of the box, spaced undercut grooves at opposite sides of the openings terminating at the corners of the body part, a connector having a member adapted to fit into the spaced grooves on one side of the body part to hold the connector in position, and closures adapted to fit in the grooves on the sides of the body part adjoining the side on which the connector is mounted for closing the openings not used for the connector, one end of each of said closures abutting an end of said member on the connector to hold said member and the connector in position.

12. A conduit coupling having a plurality of

sides at angles to each other, spaced grooves in one of said sides terminating at a corner of the coupling, spaced grooves in an adjoining side also terminating at said corner of the coupling where said first mentioned spaced grooves terminate, each of said adjoining sides having an opening intermediate the spaced grooves therein, a connector having a member adapted to slide in the spaced grooves in one of said sides, into a position over the opening in said side, a closure member adapted to slide in the spaced grooves of the adjoining side to close the opening therein and to engage said member to hold it in the grooves therefor, and resilient means for holding said closure in position.

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