July 14, 1959 E. H. SCHUSTACK 2,894,757

TUBE-MOUNTING DEVICE

Filed Oct. 21, 1957 2 Sheets-Sheet 1

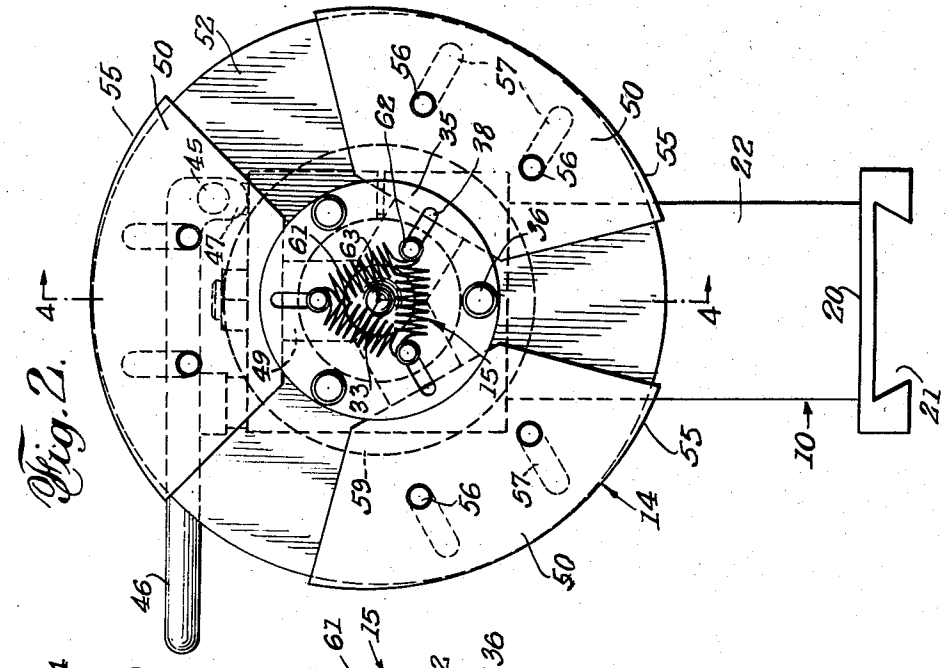


Fig. 2.

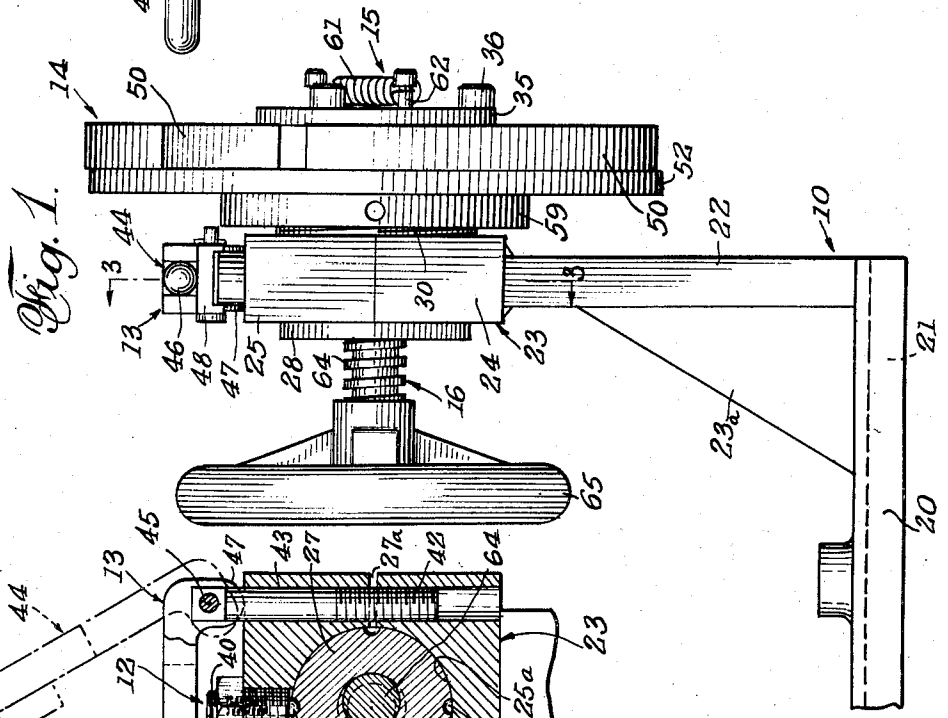


Fig. 1.

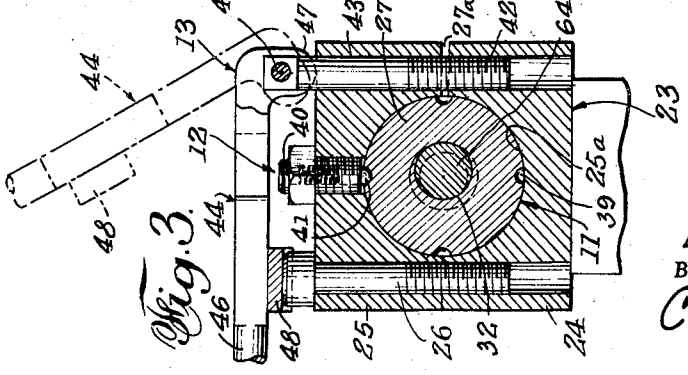


Fig. 3.

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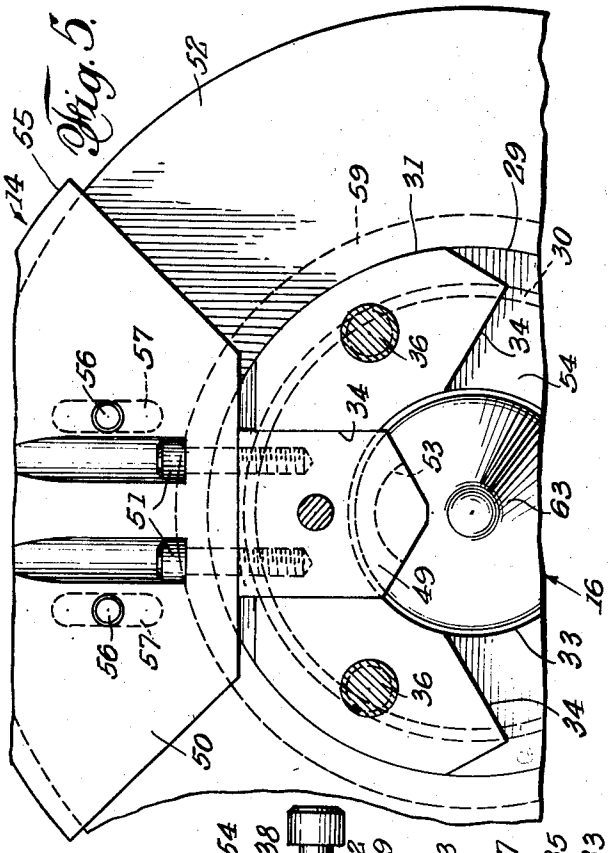


Fig. 5.

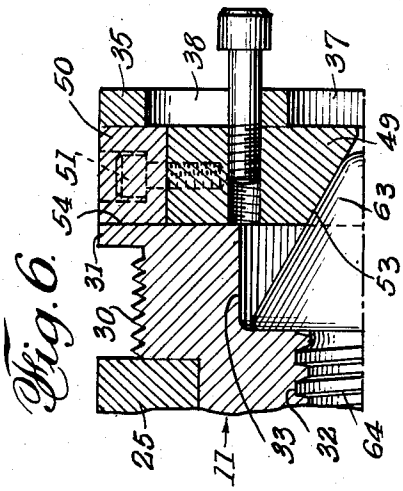


Fig. 6.

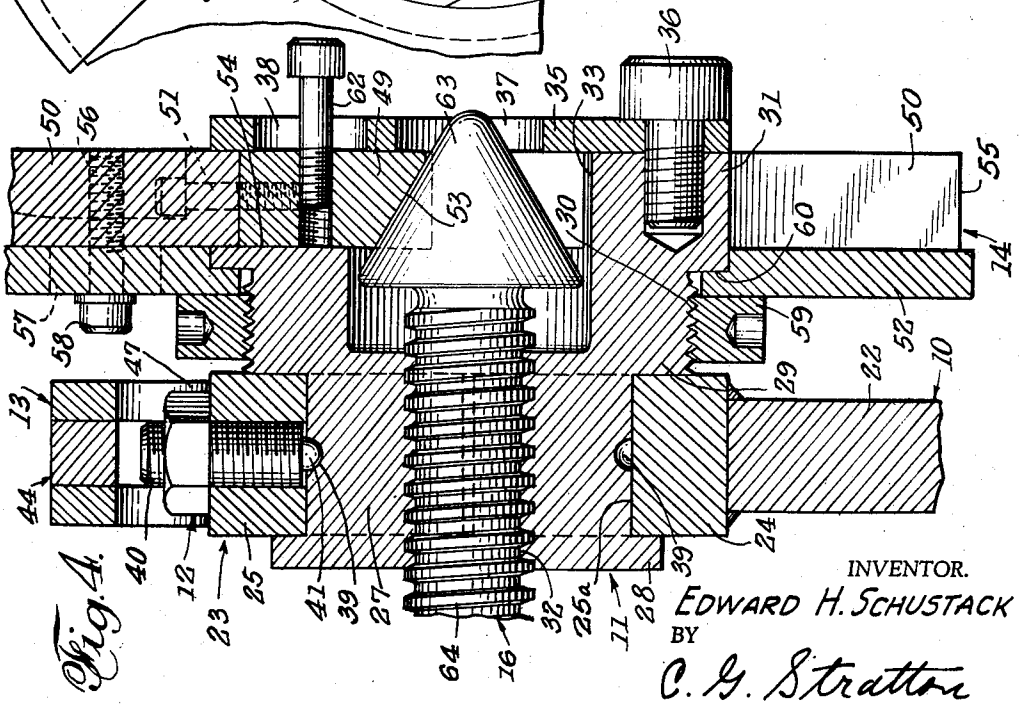


Fig. 4.

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TUBE-MOUNTING DEVICE

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Application October 21, 1957, Serial No. 691,291

4 Claims. (Cl. 279—5)

This invention relates to a device for connecting to and mounting the end of a tube or the tubular end of a T, cross, or other fitting.

An object of the present invention is to provide a tube-end mounting device that insures concentricity of a tube on a given axis and enables rotational incremental adjustment on said axis so that cuts made on the tube are accurately similarly located on a plurality of tubes successively mounted on the device.

Another object of the invention is to provide a device of the character referred to that embodies novel and improved sectional tube-engaging means whereby tubes varying greatly in diametral size may be handled by the basic components of the device with interchangeable tube-gripping jaws.

A further object of the invention is to provide a tube-mounting device of the character above referred to that embodies novel and improved indexing and locking means enabling ready and facile rotational indexing of a tube mounted thereon.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a side elevational view of a tube-mounting device according to the present invention, the same being shown in contracted condition preparatory to engaging a tube end.

Fig. 2 is a front elevational view thereof.

Fig. 3 is a vertical sectional view as taken on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged vertical sectional view as taken on the plane of line 4—4 of Fig. 2, the device being shown in partly expanded condition.

Fig. 5 is a face view of the upper portion of Fig. 4, with front parts of the device removed for clearer illustration.

Fig. 6 is a fragmentary vertical sectional view of a modification of the invention, shown in the retracted position thereof.

The present tube-mounting device comprises, generally, a support **10**, a chuck body **11** rotatively carried by the support means **12** to locate the body in the support at a desired rotational or indexed position, means **13** to lock the body thus indexed, a set of radially disposed chucks **14** carried by the body to engage a pipe end or the like when expanded, spring means **15** normally retracting the chucks **14** and manual means **16** to radially extend the chuck means into tube-end-gripping position.

The support **10** comprises a base part **20** that is preferably provided with a dovetail guide groove **21** for engagement with a rail. A bracket wall **22** extends upwardly from one end of the base part and is rendered rigid as by a brace **23***a*. The upper end of said wall **22** has affixed thereto a housing **23** which, in this instance, comprises two similar housing halves **24** and **25** that are arranged as complements of each other to define a cylindrical body seat **25***a* that is arranged on a transverse axis parallel to the plane of the base part **20**. A bolt **26** secures the housing halves together, as may best be seen in Fig. 3, the same being disposed to one side of the body seat **25***a*. The opposite side of the housing **23** is formed to have a slit **27***a* whereby the body halves may be sprung toward each other to contract the seat **25** around a body **11** therein.

The chuck body **11** comprises a cylindrical part **27** that rotationally fits seat **25***a*, an integral annular flange **28** that locates said part **27** against endwise displacement in one direction and an enlarged body part **29** on the other end of the part **27** that holds said part **27** against endwise displacement in the opposite direction. The body part **29** is provided with outer screw threads **30** on the portion thereof adjacent to the cylindrical part **27**. A flange enlargement **31** is provided on the body part **29** forwardly of where said threads **30** are provided.

As can best be seen from Figs. 4 and 5, an axial integral thread **32** is formed in the rearward part of the body and a concentric cavity **33** is formed in the forward part. The part of the body that has the flange enlargement **31** is provided with radial grooves or slots **34**. In this case, three such slots are shown, the same extending into the cavity **33**.

A front plate **35** is secured, as by cap screws **36**, to the front face of the body, the same forwardly enclosing the slots **34** so that the same may constitute radial guides. A central hole **37** is provided in said plate as also is a set of radial slots **38** that are preferably centered on the respective slots **34**.

The means **12** (Figs. 3 and 4) is shown as a set of dimples or indents **39** in the body part **27**. In this case, the same are arranged at 90° angular phased increments, although this phasing may vary, as desired. A detent device **40** is mounted, preferably on the housing half **25**, and carries a spring-biased plunger or ball **41** that enters the indent **39** that is aligned therewith. Thus, the body **11** may be indexed to a desired rotational position around its axis.

The locking means **13** is best seen in Fig. 3 and, in this case, comprises a bolt **42** threadedly engaged with housing half **24** on the side of the axis of the body that is opposite to the fastening bolt **26** and extending through an aligned clearance hole **43** in the housing half **25**, and a locking or clamping lever **44** connected to said bolt **42**, as by a cross pin **45** on which said lever is movable, as suggested in Fig. 3.

Said lever **44** has a handle end **46** and a cam wedge **47** at its end adjacent the pivot **45**, the latter extending into engagement with the top of the housing half **25** on each side of the clearance hole **43**. Since the bolt is threadedly connected to the housing half **24**, the cam wedge **47** presses the housing half **25** in a direction to contract the seat **25***a* around body part **27**, when the handle end **46** of lever **44** is in the horizontal position shown. By swinging said handle upwardly on its pivot **45**, as to the dot-dash line position of Fig. 3, the cam wedge is raised to release the housing half **25** and thereby allow the seat **25***a* to expand. A stop **48** on the handle engages the cap of screw or bolt **26** to limit the locking position of the lever **44**. Said stop **48** is so formed as to straddle said

screw cap so as to prevent rotation of the locking assembly in normal use.

The radially arranged chucks 14 are shown as a set of three, although a different number of chucks may be used. In this instance, each chuck comprises a lug 49 that radially slidingly fits a groove 34, a chuck jaw 50 secured to the outer end of the lug 49, as by screws 51, and a backing plate 52 for said jaws providing the same are larger than a predetermined minimal size. As seen in Fig. 6, for instance, the backing plate 52 is omitted since the chuck jaw 50 is relatively small so that a set of three of such jaws will internally expand into a tube or pipe only slightly larger than the cylindrical part 31 of the body 11. As seen in the other views of the drawing, jaws 50 for substantially larger tubes or pipes are backed by plate 52 to impart rigidity to the assembly.

As can be seen in Fig. 2, the lugs 49, when in retracted position, nest together around the axis of the body. Each lug is provided on its lower rearward side with a conical seat 53, the three seats of the three lugs, together, forming a conical cavity.

The backing plate 52 is mounted on the body part 31 and is, therefore, centered on the axis of said body. The forward face 54 of said plate is coplanar with the bottom or rearward faces of the radial grooves 34. The chuck jaws 50 are formed as radial extensions of the lugs 49 and the same slide along the plate face during radial adjustment of the chucks by the means 16.

The outer edge of each jaw is formed as an arc 55, the three arcs combining to internally grip a tube or pipe into which the chucks are expanded. The backing plate is rendered effective to support the jaws 50 by the provisions of bolts or screws 56 that are threaded in said jaws and have sliding engagement in slots 57 in the backing plate. Heads 58 on said screws 56 retain the jaws flatwise against the backing plate.

A nut 59, on the body threads 30, locks the backing plate in its jaw-guiding position against the rearward face 60 of the body flange 31.

The means 15 is shown as a set of three contraction springs 61 that are provided to pull the chucks to retracted position. Each chuck lug 49 is provided with a forwardly directed bolt or stud 62 that extends through a slot 38 previously described in connection with plate 35. By connecting the springs 61 between the respective studs 62, the same resiliently draw the chucks to retracted position, as shown in Fig. 2.

The means 16 projects the chucks against the bias of the springs 61. A conical point 63 of the means 16 is arranged on the axis of the body 11 and is directed to engage the seats 53 of the chuck lugs 49. A threaded shank 64 constitutes a rearward extension of said point 63 and is engaged in the threads 32 of the body 11. Said shank extends rearwardly from said body and the same is provided with a handwheel 65.

It will be clear that manual manipulation of the handwheel extends or retracts the point 63, according to the direction in which said wheel is turned, to cause radial extension of the chucks or allow radial retraction thereof under bias of the means 15.

Until the locking means 13 is operated the chucks hold a tube or pipe in fixed relation to a saw or other tool. Upon release of said means 13, the tube or pipe or other workpiece may be indexed, as above described, to change the angular increment of the workpiece to a tool according to the angular relationship between the indents 39.

While the foregoing has illustrated and described what I now contemplate to be the best mode of carrying out my invention, the construction is, of course, subject to modification without departing from the spirit and scope of my invention. Therefore, I do not desire to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

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

1. A tube-mounting device comprising a chuck body provided with radially movable chuck jaws for internally gripping a tubular member, said body being provided with a cylindrical part laterally offset from said jaws, a two-part housing around said cylindrical part forming a split seat for said part, said cylindrical part having at least two circumferentially spaced indentations, one of the housing parts being provided with a spring-biased detent to enter said indentations, selectively, to locate the chuck body and a tube gripped by the jaws thereof, means carried by the housing to bias the parts thereof toward each other and to tightly clamp the cylindrical part of the chuck body to, thereby, firmly hold the chuck body, as located by an indentation and detent, against turning relative to the housing, and a support bracket for said housing.

2. A tube-mounting device according to claim 1 in which the means to bias the housing parts to chuck body-clamping position comprises a bolt to connect the housing parts on one side of the cylindrical part of the chuck body, a second bolt on the other side of said cylindrical part and extending from one housing part through the other, and a cam-provided handle pivotally connected to the latter bolt and provided with a cam portion to engage said other housing part and bias the same, in one position of the handle, toward the first housing part.

3. In a tube-mounting device having a tube-gripping chuck provided with a cylindrical part having at least two circumferentially spaced indentations, a bracket-supported two-part housing having a split cylindrical seat in which said chuck part is positioned, a bolt on one side of said seat connecting the housing parts, a second bolt on the other side of the seat and extending from one housing part freely through the other, a cam-provided handle pivotally mounted on said second bolt, the cam on said handle engaging one housing part, and biasing the parts together to clamp the housing parts around the chuck part, and a detent to selectively engage said indentations to angularly locate the chuck relative to the housing before clamping of the cylindrical part thereof.

4. In a tube-mounting machine according to claim 3, said handle with the cam thereof in clamping engagement, being directed from the bolt on which the same is pivotally mounted transversely across the top of the housing and over the other bolt, and means on said handle engaged with said other bolt to hold the handle against angular movement during its clamping position.

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