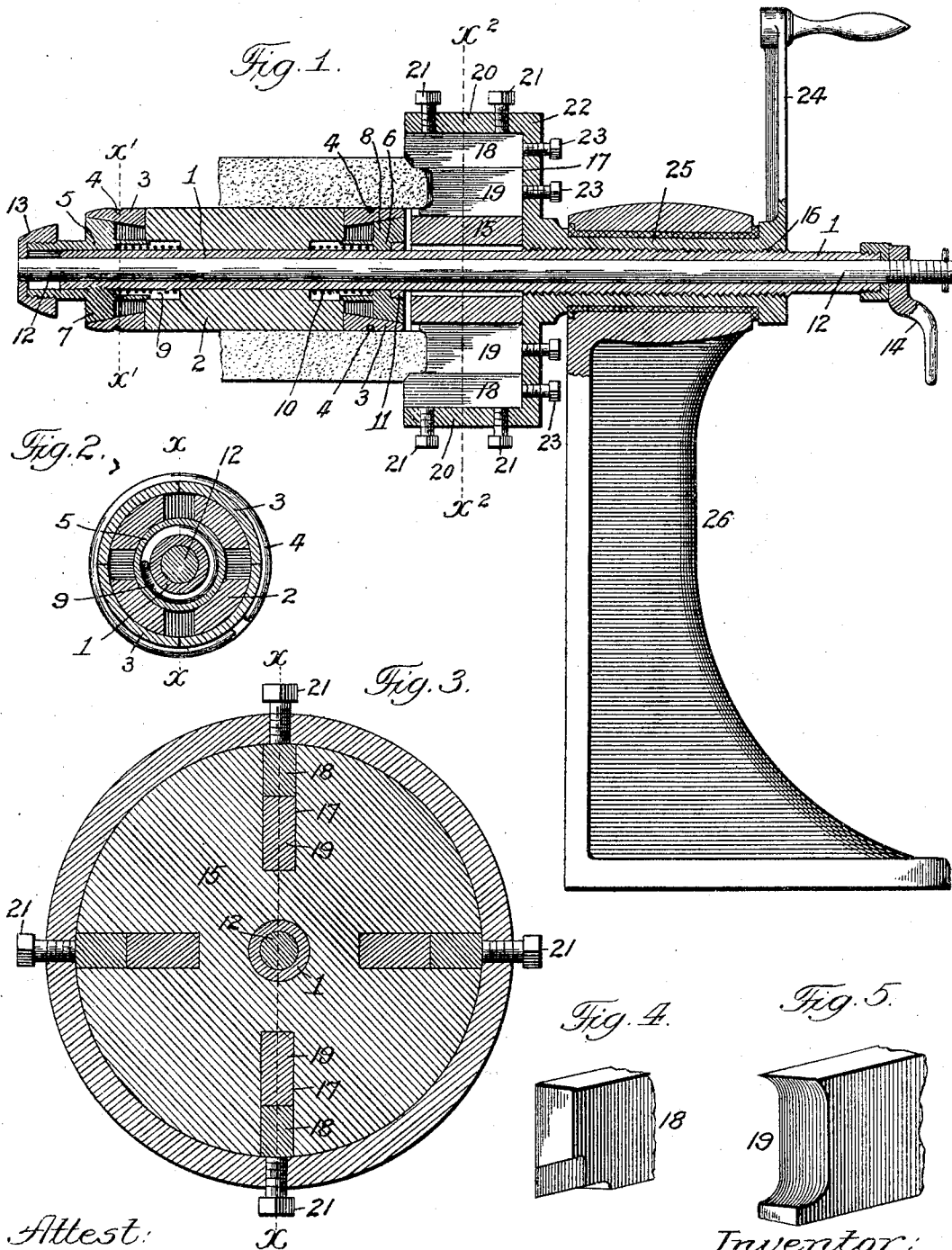


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J. KOHLER.
MACHINE FOR TRIMMING CONCRETE CONDUITS.
APPLICATION FILED MAR. 14, 1904.



Attest:
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Fig. 4. *Fig. 5.*
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UNITED STATES PATENT OFFICE.

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MACHINE FOR TRIMMING CONCRETE CONDUITS.

SPECIFICATION forming part of Letters Patent No. 794,989, dated July 18, 1905.

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To all whom it may concern:

Be it known that I, JOSEPH KOHLER, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Trimming Concrete Conduits, of which the following is a specification.

The present invention relates to means for truing up the ends of cylindrical tubes of concrete employed in underground conduits for electrical conductors, and has for its object to provide a simple and efficient centering and cutting mechanism by which a section of concrete tubing is properly centered with relation to the cutters and the ends of said tubing squarely trimmed off and the end portions of the periphery thereof reduced to proper concentric relation to the interior bore of the tubing and to the proper diameter to receive an ordinary sheet-metal sleeve, by which the adjacent ends of two sections of concrete tubing are joined together and the alinement of their bores insured preliminary to the bedding of the tubes in a holding mass of concrete beneath the ground, all as will hereinafter more fully appear, and be more particularly pointed out in the claims.

In the accompanying drawings, illustrative of the present invention, Figure 1 is a longitudinal sectional elevation at line $x x$, Figs. 2 and 3, of a hand implement involving the present invention. Fig. 2 is an enlarged transverse section at line $x' x'$, Fig. 1, of the expanding-mandrel portion of the implement. Fig. 3 is an enlarged transverse section at line $x'' x''$, Fig. 1, of the rotary cutter-head of the implement. Figs. 4 and 5 are detail perspective views of outer and inner cutter-sections of the rotary cutter-head.

Similar numerals of reference indicate like parts in the several views.

In the manufacture of the ordinary cylindrical tubes of concrete for underground conduits the main practical difficulty experienced is that while a true circular bore is attained by the mold-core or mandrel the concentricity of the periphery of the tube with relation to the bore cannot be attained under usual

conditions, owing to the sectional nature of the outer casing of the mold and the springing and shifting of said sections under the heavy stress employed in the molding operation.

The present invention accordingly consists of a mechanism by means of which the ends of such concrete tubing after manufacture and setting or hardening are trimmed off square and the periphery at the ends reduced to proper concentricity with the cylindrical bore of the tubing, and to such end the said mechanism will comprise a structural formation and combination of parts, as follows:

1 represents a tubular supporting-shaft for both the expanding mandrel and the rotary cutter-head of the present appliance.

2 is the central body portion of the expanding mandrel arranged on one end of the tubular supporting-shaft 1 and capable of limited longitudinal adjustment thereon in the expanding and contracting operations of the mandrel.

3 represents counterpart sectional rings occupying annular offsets at the respective ends of the body portion 2 of the mandrel, the bores of said rings having a taper or cone form arranged in reverse relation to each other and adapted to have operative contact with the corresponding cone or taper peripheries of the pair of longitudinally-adjustable expander-heads hereinafter described.

4 represents ring-shaped springs fitting peripheral grooves in the sectional rings 3 aforesaid and tending to force the same into their contracted and normal condition.

5 and 6 are the pair of expander-heads, having central bores which fit the tubular supporting-shaft 1 and adapted to have longitudinal adjustment thereon. Such heads are preferably formed with cylindrical body portions that fit counterbores in the respective ends of the body portion 2 of the mandrel and are provided on their peripheries with a series of radial longitudinal ribs 7 and 8, the outer surfaces of which are of a taper or cone form to correspond with the taper or cone form of the bores of the sectional rings 3 aforesaid, and such ribs are adapted to move longitudi-

nally and be guided in their movements by longitudinal grooves in the offset ends of the body portion of the mandrel.

9 and 10 are coiled springs interposed between the inner ends of the respective heads 5 and 6 and the adjacent ends of the before-mentioned counterbores of the body portion 2 of the mandrel and tending to force the said heads in a direction away from said body portion to attain a normally contracted condition of the expanding-mandrel parts.

11 is a stop-collar on the tubular supporting-shaft 1, against which the inner expander-head 6 abuts and is held from longitudinal movement on said shaft.

12 is the mandrel-operating shaft arranged longitudinally in the bore of the supporting-shaft 1 and projecting therefrom at each end for the purposes hereinafter stated.

13 is a collar screwed or otherwise secured to the forward projecting end of the shaft 12 and which collar is in turn connected to the forward or outer end of the expander-head 5, so that a longitudinal movement of said parts will take place in unison. In the preferred form of the present invention the collar 13 is made of some size and its periphery made conical, as shown in Fig. 1, with a view to aid in the insertion of the mandrel into the bore of a section of concrete tubing to be operated upon.

14 is an operating handle or wheel having a screw-threaded hub portion screwing upon the screw-threaded projecting rear of the shaft 12 aforesaid and having bearing against the rear end of the tubular supporting-shaft 1, as shown in Fig. 1. With the described arrangement a rotation of the handle 14 in one direction will draw the shaft 12 backward through the tubular shaft 1 and cause the expander-heads 5 and 6 to approach each other and effect an expansion of the mandrel parts, while a rotation of said handle in an opposite direction will permit the shaft 12 to move forward under the stress of the springs 9 and 10 and permit the spring 4 to move the mandrel parts into their contracted position.

15 is the central cylindrical portion of the rotary cutter-head of the present appliance arranged in concentric relation to the tubular mandrel-supporting shaft 1 and adapted to be moved longitudinally thereon, as hereinafter set forth.

17 represents a series of radial recesses in the body portion 15 for the reception of the cutter-blades, which in the present construction comprises an outer series of cutter-sections 18 and an inner series of cutters 19, arranged edge to edge in the radial recesses 17 and having the forward and outer cutter edges of the outer series of cutters 18 arranged to overhang the forward or cutting edges of the inner series of cutters 19, as shown in Fig. 1, and so that as the rotary cutter-head moves

forward in an active operation of the present mechanism the inner series of cutters 19 will trim the end of the concrete tube operated upon squarely, while the outer series of cutters 18 will produce a reduced circular neck upon the end portion of the tube with the periphery of such neck in true concentricity with the circular bore of said tube.

20 is an annular portion of the cutter-head affording bearings for the clamping-screws 21, by which the cutter-sections are forced inwardly and clamped in the recess 17 aforesaid.

22 is a disk-shaped end portion of the cutter-head affording bearings for the adjusting-screws 23, by which the cutter-sections are adjusted longitudinally. Such end portion in the preferred form of the present invention, as shown in the drawings, is provided with a tubular extension 25, by which the cutter-head is journaled in the upper end of a supporting frame or pedestal 26, bolted to the floor or to a work table or bench. As so constructed the extension 25 is provided at its rear end with a handle 24 for effecting a rotation of the cutter-head in the practical use of the appliance.

In the construction shown positive longitudinal feed movement is imparted to the holding-mandrel and the section of concrete tubing carried thereon by a screw-thread 16, formed on the periphery of the mandrel-supporting shaft 1, engaging a corresponding screw-thread formed in the bore of the tubular extension 25 of the cutter-head, the arrangement being such that with a rotation of the cutter-head a corresponding longitudinal movement will be imparted to the holding-mandrel and section of concrete tubing carried thereon.

When it is desired to use the present improvement as a portable appliance in a yard or at the place where the conduit is being laid, the pedestal 26 will be dispensed with and any usual holding means employed to hold the section of concrete tubing during the operation of the appliance.

It is also within the scope of the present invention to journal a pair of the present combined expanding mandrels and cutter-heads upon a pair of sliding carriages having movement to and from each other and to drive the whole by power instead of by hand, as heretofore described.

The operation of the present appliance is as follows: The end of the section of concrete tubing to be trimmed is placed over the holding-mandrel while the same is in its normal condition, after which the hand-lever 14 is rotated to cause the mandrel parts to expand within the bore of the concrete tube to center and at the same time firmly hold said tube against independent movement with relation to the mandrel. The cutter-head is then ro-

tated by the handle 24, and as it rotates the mandrel carrying the section of concrete tubing is gradually drawn against the cutter-blades 18 and 19 through the instrumentality of the screw 16 to reduce the end periphery of the section of concrete tubing to a concentric relation to the circular bore of such tubing. After the described trimming operation is performed a reverse rotation of the cutter-head is effected by the handle 24 to cause the mandrel and section of concrete tubing to move longitudinally away from the cutter-head. Then by a reverse rotation of the hand-lever 14 the mandrel is caused to release its holding engagement with the concrete tube-section, and the same is removed and replaced by a fresh section for a repetition of the operations above described.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a supporting-shaft provided with means for centering and holding a concrete tube by its bore, a rotary cutter-head mounted on said shaft, and an outer

and inner series of cutter-blades carried by said head with the outer series overhanging the inner series, said blades being adapted to have endwise trimming engagement with the end and periphery of the concrete tube to form a square and reduced concentric neck on the end thereof, substantially as set forth.

2. The combination of a supporting-shaft provided with means for centering and holding a concrete tube by its bore, a rotary cutter-head mounted on said shaft by means of a screw-thread connection, and an outer and inner series of cutter-blades carried by said head with the outer series overhanging the inner series, said blades being adapted to have endwise trimming engagement with the end and periphery of the concrete tube to form a square and reduced concentric neck on the end thereof, substantially as set forth.

Signed at Chicago, Illinois, this 5th day of March, 1904.

JOSEPH KOHLER.

Witnesses:

ROBERT BURNS,
M. H. HOLMES.