

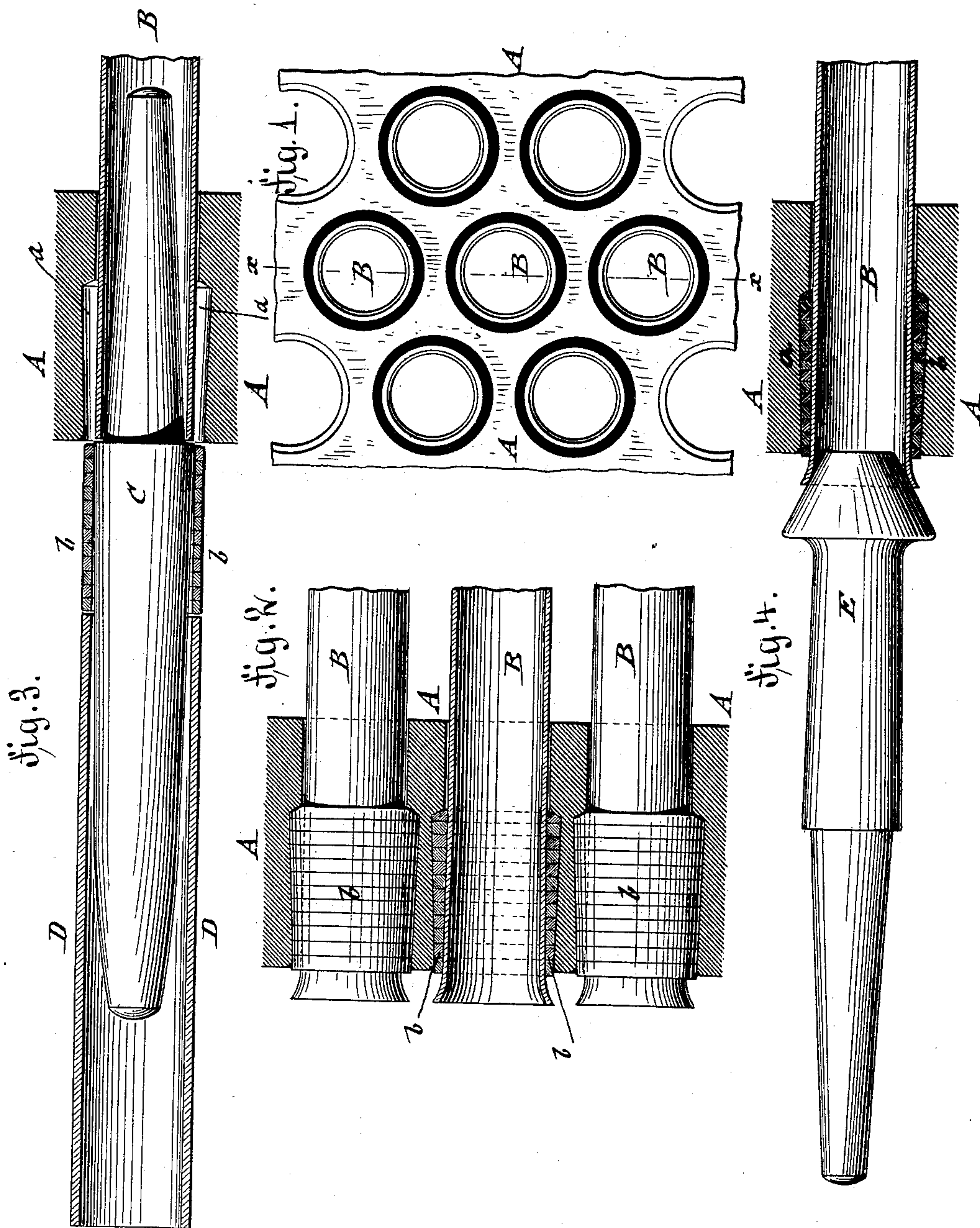
(No Model.)

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TUBE PACKING FOR SURFACE CONDENSERS.

No. 341,554.

Patented May 11, 1886.



WITNESSES
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TUBE-PACKING FOR SURFACE-CONDENSERS.

SPECIFICATION forming part of Letters Patent No. 341,554, dated May 11, 1886.

Application filed August 1, 1885. Serial No. 173,206. (No model.)

To all whom it may concern:

Be it known that I, DELPHIN B. COBB, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Tube-Packings for Surface-Condensers, of which the following is a specification.

This invention relates to an improved tube-packing for surface-condensers of that class in which the packing of the tube is retained without the use of a screw-thimble by a simple expansion of the ends of the tubes; and the invention consists of the combination of a tube-head having holes with annular recesses for the tube ends, which recesses taper from their bottoms or seats to the outer surface of said head, a packing consisting of a number of rings or washers of suitable material, and condenser-tubes, the ends of which are enlarged or expanded.

In the accompanying drawings, Figure 1 represents a front view of a portion of a tube-head of a surface-condenser in which the tubes are packed according to my invention. Fig. 2 is a vertical transverse section of the same on line *xx*, Fig. 1. Fig. 3 is a vertical transverse section of the tube-head, showing the packing in the act of being placed around the end of a condenser-tube; and Fig. 4 is also a vertical transverse section of the tube-head, showing the expanding-tool in the act of expanding the packed tube end.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the tube-head of a surface-condenser, which tube-head is made of cast-iron, brass, or other suitable cast metal, and provided with a number of holes for the condenser-tubes B, said holes being provided with annular recesses *a*, that are tapering from their bottoms or seats to the outside of the head. The tapering recesses *a* are obtained by properly coring the mold for the tube-head, the recesses being obtained thereby in a perfectly smooth and accurate state, so as not to require any reaming out. The condenser-tubes B are inserted into the holes of the tube-head and then packed by rings or washers *b b*, which are driven into the recesses *a a* by a special packing-tool. (Shown in Fig. 3.)

The packing-tool consists of a tapering mandrel, C, which is thicker at its middle part, so as to form a shoulder that is equal in diameter with the outer diameter of the tube B. The washers or rings *b b* are placed on the thicker portion of the mandrel C and driven into the recesses *a a* by means of a driving-tube, D, and mallet.

The washers or rings *b b* are made of compacted asbestos paper, cork paper, or other suitable material adapted for packing the tubes of surface-condenser heads, whereby a better and tighter joint is produced than with the cotton-wick packing or rolled-paper cylinders heretofore in use.

The washers or rings *b b* have the further advantage that they can be readily taken out when the condenser has to be cleaned or repaired and used over again, which cannot be done with the cylindrical paper packing made in one piece for each tube end, as it is difficult and expensive to drill the same out, and involves a total loss of packing and injury to the tubes.

The tapering recesses *a a* of the condenser-head A serve to retain the packing-rings securely in position in connection with the expanded ends of the condenser-tubes.

The expanding of the tube ends is accomplished by an expanding-tube, E, having a conical end, as shown in Fig. 4. The tube ends receive thereby an outwardly-flaring shape, which prevents the crawling or moving out of the packing. This is preferable to slitting the ends by saw-cuts, as this weakens the tubes and causes them to break when they are repeatedly contracted for repacking and expanded again. By expanding the tube ends without saw-cuts they can be contracted and expanded a great many times without cracking or breaking.

In this manner a very cheap and simple tube-packing for surface-condensers is obtained, which not only permits the quick and tight packing of the tubes, but which also facilitates the repair of the condensers and the repacking of the tubes without any loss of packing, whereby the expense for condensers is decreased and their durability considerably increased.

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

The combination of a tube-head having tube-holes with recesses tapering from their bottoms or seats toward the outer surface of the head, condenser-tubes having conically-expanded outer ends, and a number of packing rings or washers driven into the tapering recesses around the tubes, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

DELPHIN B. COBB.

Witnesses:

PAUL GOEPEL,
MARTIN PETRY.