H. MEYER.

Machine for Lining Tubing.

No. 198,547. Patented Dec. 25, 1877.

Fig. 1.

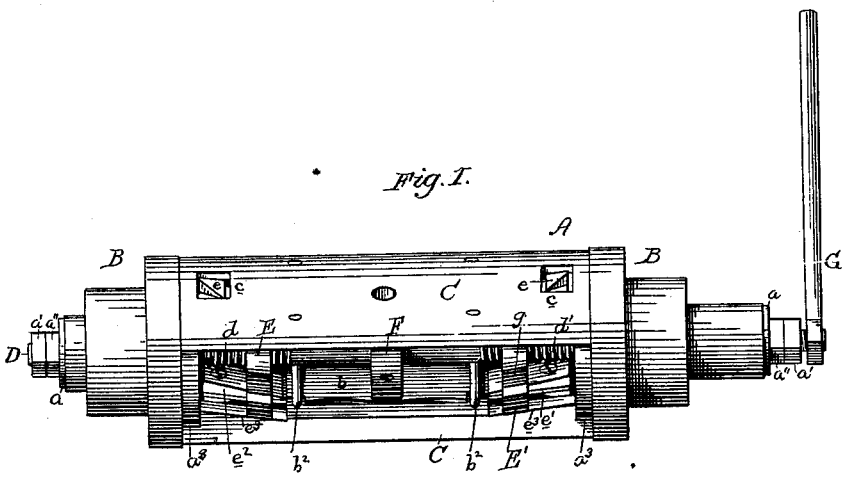



Fig. 2.

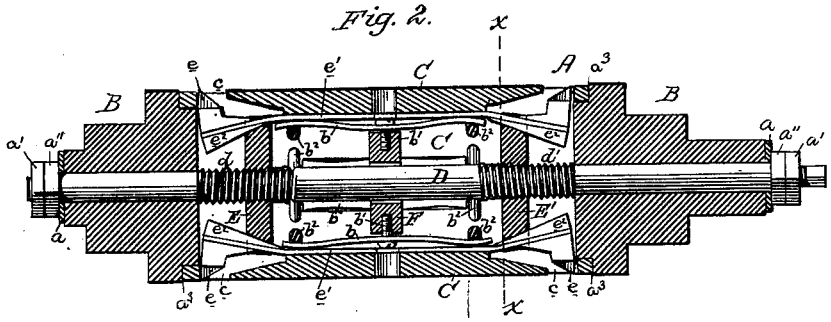



Fig. 3.

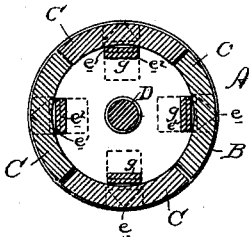
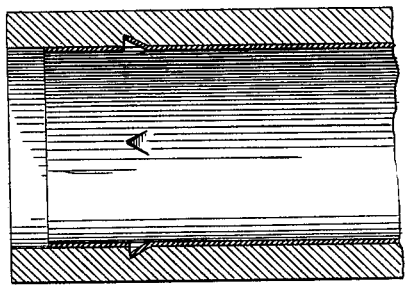



Fig. 4.



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# UNITED STATES PATENT OFFICE.

HERMAN MEYER, OF TOLEDO, OHIO.

## IMPROVEMENT IN MACHINES FOR LINING TUBING.

Specification forming part of Letters Patent No. **198,547**, dated December 25, 1877; application filed November 20, 1877.

*To all whom it may concern:*

Be it known that I, HERMAN MEYER, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Machines for Lining Pump or other Tubing, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of my improved machine with one of the movable sections removed. Fig. 2 is a longitudinal section of the same. Fig. 3 is a cross-section on line *x x*. Fig. 4 is a sectional view of a pump-tubing, showing the manner in which the metal lining is secured therein.

This invention relates to improvements in the class of machines for lining wooden tubing for pumps and other purposes with copper, galvanized iron, or other suitable material; and the invention consists in the combination of parts, all as hereinafter fully described.

To enable others skilled in the art to make and use my invention, I will proceed to describe the exact manner in which I have carried it out.

In the drawings, A represents a cylinder, consisting of the heads B and expansible sections C. D represents a shaft passing centrally through the heads B B of the cylinders. The heads B are secured from moving lengthwise of the shaft by means of the washers and nuts *a a' a''*, the heads B, however, fitting loosely upon the shaft to permit the shaft to be turned without moving the heads. The heads are also cut out at $a^3$ to admit of the sections C lying flush with the heads when said sections are not expanded.

The shaft D is provided, near each end, with screw-threads *d d'*, said screw-threads being cut reversely to each other. E E' represent two conical screw-rings, arranged upon the shaft D, and which are forced toward or from each other by means of the reversely-cut screw-threads *d d'*. Centrally arranged upon the shaft D is a loosely-fitting ring, F, to which the sections C are adjustably secured by means of the springs *b* and screws $b^1$. The springs *b* are secured upon the inner sides of the sections C by means of the staples $b^2$ $b^2$. The sections C are provided, near each end, with holes *c*, through which pass the punches *e*. These punches are secured to the ends of metallic spring or other yielding bars $e^1$, said bars $e^1$ being secured to the inner sides of the sections by the staples $b^2$, that secure the springs $b^1$ in position. The spring-bars $e^1$ are also provided upon their interior surfaces, and at the ends thereof, with wedges or cams $e^2$, and which, when the sections C are in position to form the cylinder, fit within the recesses *g* in the conical screw-rings E E'.

The sections C are also cut out upon their inner surfaces for the reception of the spring-bars and conical rings, and also to form wedges or cams $e^3$ similar to those on the spring-bars $e^1$, and by means of which the sections are expanded or contracted by forcing the conical screw-rings from or toward each other.

The operation of my improved machine is as follows: The metal lining for the pump-tubing is cut the proper size, and so as to overlap at its edges when placed in the tubing. The cylinder A with its sections contracted is then inserted in the tubing and inside of the lining, after which the shaft is turned to the right by the wrench G, which forces the conical rings from each other, and which, coming in contact with the cams or wedges *g* of the sections, expands said sections, which presses the lining against the interior surface of the tubing. At the same time the punches *e*, by means of the wedges $e^1$ and conical rings, are forced out through the holes *c* of the sections and through the metal lining. The punches, being shaped as shown, cut the metal in V-shaped form, forcing the pieces of metal so cut into the wood tubing, thus securing the lining therein. By means of the expanding sections the lining is made to fit smoothly and closely against the whole interior surface of the tubing.

By turning the shaft to the left the conical rings are moved toward each other, thus allowing the sections and punches to resume their original position, or be contracted, which is accomplished by means of the springs and spring-bars, to which they are respectively attached.

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

1. The combination, with a cylinder having

expansible and contracting sections, having the holes *c*, of the spring-bars $e^1$, having punches *e*, substantially as and for the purpose set forth.

2. The combination of the cylinder A with its sections C, having wedges or cams $e^3$ and holes *c*, the spring-bars $e^1$, provided with the punches *e*, and the shaft having screw-threads *d d'* and conical rings E E', substantially as and for the purpose set forth.

3. The combination of the rings E E', having the recesses *g* and the bars $e^1$, provided with the wedges $e^2$, substantially as and for the purpose set forth.

4. The combination of the shaft provided with the ring F, and the sections C, provided with the springs *b*, secured together, substantially as and for the purpose described.

5. The combination of the cylinder A, consisting of the heads B and expansible and contracting sections C, having holes *c*, wedges or cams $e^3$, springs *b*, and spring-bars and punches $e^1$ *e*, and the shaft D, having screw-threads *d d'*, conical screw-rings E E, and ring F, all combined and arranged to operate substantially as and for the purpose set forth.

HERMAN MEYER.

Witnesses:
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