(Model.)

W. I. B. McHALE.

TUBE EXPANDER.

No. 338,423. Patented Mar. 23, 1886.

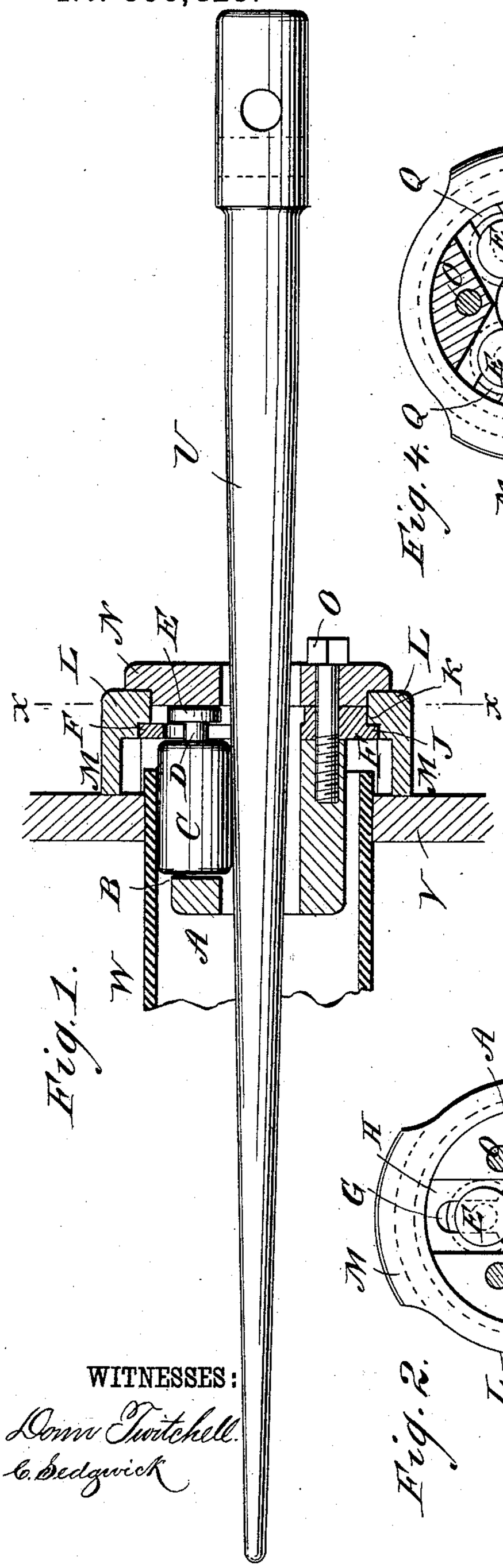

Fig. 1.

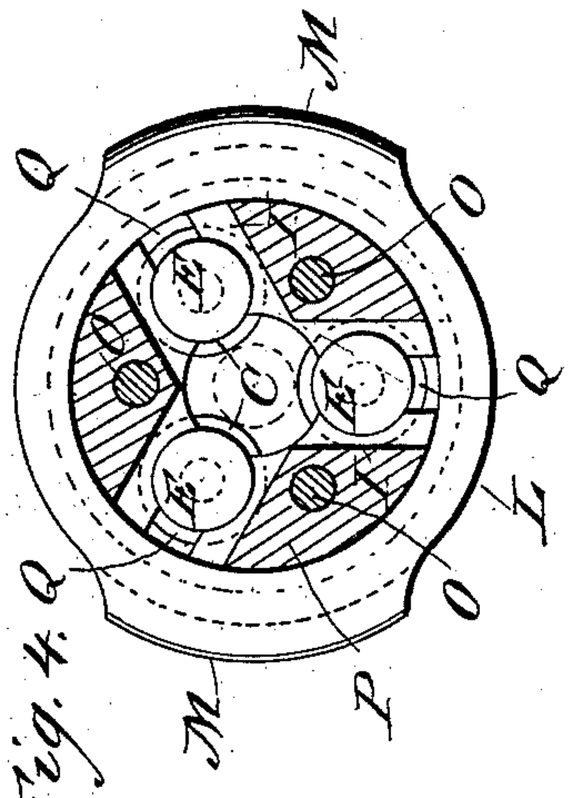

Fig. 4.

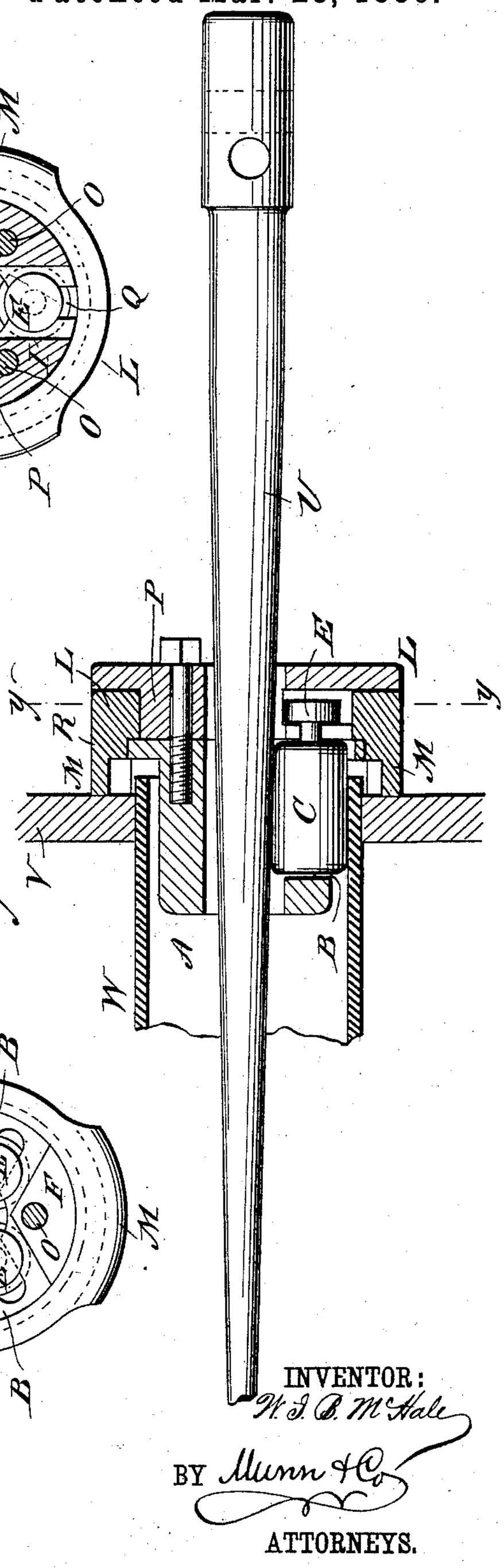

Fig. 3.

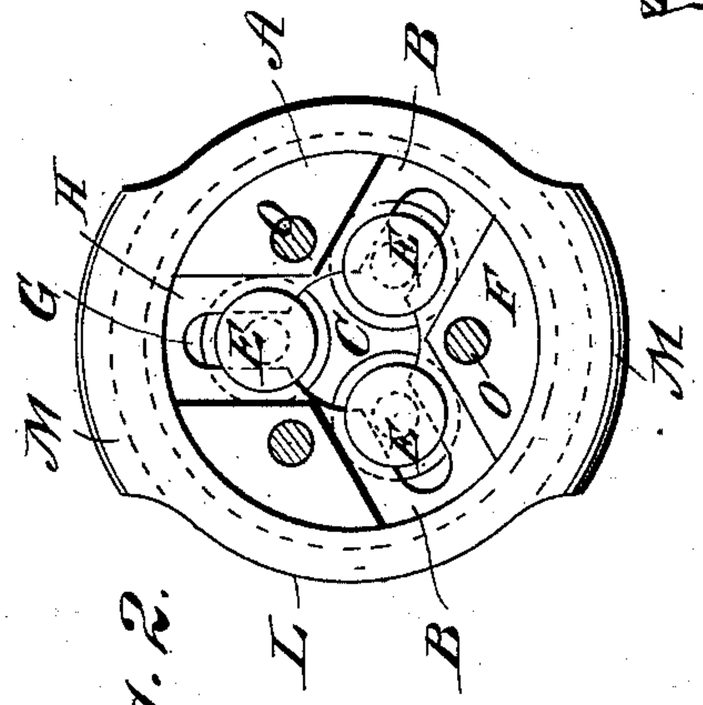

Fig. 2.

WITNESSES:

Donn Twitchell.

C. Sedgwick

INVENTOR:

W. I. B. McHale

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM IGNATIAUS BENEDICT McHALE, OF NEW YORK, N. Y.

TUBE-EXPANDER.

SPECIFICATION forming part of Letters Patent No. 338,423, dated March 23, 1886.

Application filed April 21, 1885. Serial No. 162,915. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM IGNATIAUS BENEDICT McHALE, of the city, county, and State of New York, have invented certain new and useful Improvements in Tube-Expanders, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved implement for expanding the ends of tubes.

This invention relates to an improvement in tube-expanders of that class employing rollers having their axes journaled or movable in slots in the heads between which the rollers are disposed; and the invention consists of the combination of parts, including their construction, substantially as hereinafter described, and pointed out in the claim.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved tube-expander. Fig. 2 is a cross-sectional elevation of the same on the line *x x*, Fig. 1. Fig. 3 is a longitudinal sectional elevation of a modification of the same. Fig. 4 is a cross-sectional elevation of the same on the line *y y*, Fig. 3.

The tubular stock A is provided with a series of slots, B, extending from the rear to near the front end, and which are slightly contracted at the bore of the stock, so that they are wider at the outside of the stock than at the inside. Each slot contains a roller, C, having one end cut off square and the other end provided with a stem, D, having a flat head, E. A flat ring, F, resting on the inner or open end of the stock, has as many radial slots G as there are rollers C, and as many grooves H for the heads E. The ring F has a shoulder, J, on its edge, which fits a shoulder, K, on a ring, L, having lugs M projecting toward the front end of the stock. A flat ring, N, having a projecting part fitting in the ring L is placed on the ring F, and screws O are passed through apertures in the rings N and F into the shanks in the stock, the ring L being adapted to turn on the rear end of the stock.

The heads E can slide between the bottoms of the grooves H and the flat ring N. As shown in Figs. 3 and 4, the slots B may extend to within a short distance from each end of the stock, and the stock has a head, P, provided with radial slots Q, extending from the middle to the rim, and grooves I. The stock has a flange, R, against which the ring L, provided with the lugs M, is placed.

The head P is held in place on the end of the stock by the screws O, passed through apertures in the head and screwed into the shanks or legs of the stock.

The heads E slide in the grooves I to and from the middle of the stock, and are prevented from sliding entirely out of the grooves I by the ring L. In both constructions the front ends of the rollers C, which ends are subjected to the greatest pressure, rest loosely against the ends of the slots B at the front end of the stock, and are only guided at the rear end of the stock by the slots and grooves.

The rollers C are placed in the slots B from the outside, and cannot pass into the central bore of the stock, as the slots are narrowest at the said bore, and have less width at said bore than the diameter of the roller.

The operation is as follows: The stock is placed into the end of the tube W until the lugs M rest against the plate V, and then a mandrel, U, is inserted in the expander and presses the rollers radially outward and against the inner side of the tube. By turning the mandrel a revolving motion is given to the stock and rollers, and as the rollers act in the tube they expand its end.

As the rollers have considerable play, the device can be used for tubes of various diameters.

A special advantage of my expander is, that the rollers have no projections or guides at the front ends, which are subjected to the greatest strain. In case a small tube is to be expanded, the mandrel U need be placed but a short distance in the stock, as the rollers C need not be spread very far; but where a larger tube is to be expanded the mandrel must be introduced a greater distance into the stock to expand the tube sufficiently.

Heretofore tube-expanders have been provided with radially-movable rollers, and such rollers have been held between two plates, one of said plates being provided with radial

slots to receive axes or trunnions of the rollers, and I do not broadly claim such construction as my invention.

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

In a tube-expander, the combination, with a tubular stock having longitudinal slots extending from the inner to the outer surface, of rollers or cylindrical swages having necks, on the ends of which necks heads E are formed, the end piece, P, having radial slots and grooves and placed against the outer end of the stock, the ring L, placed on the end piece to revolve around the same, and of the screws O, passed through the end piece into the stock for the purpose of holding the end piece on the stock, substantially as herein shown and described.

WILLIAM IGNATIAUS BENEDICT MCHALE.

Witnesses:

JAMES MCHALE,

FERDINAND S. MCHALE.