

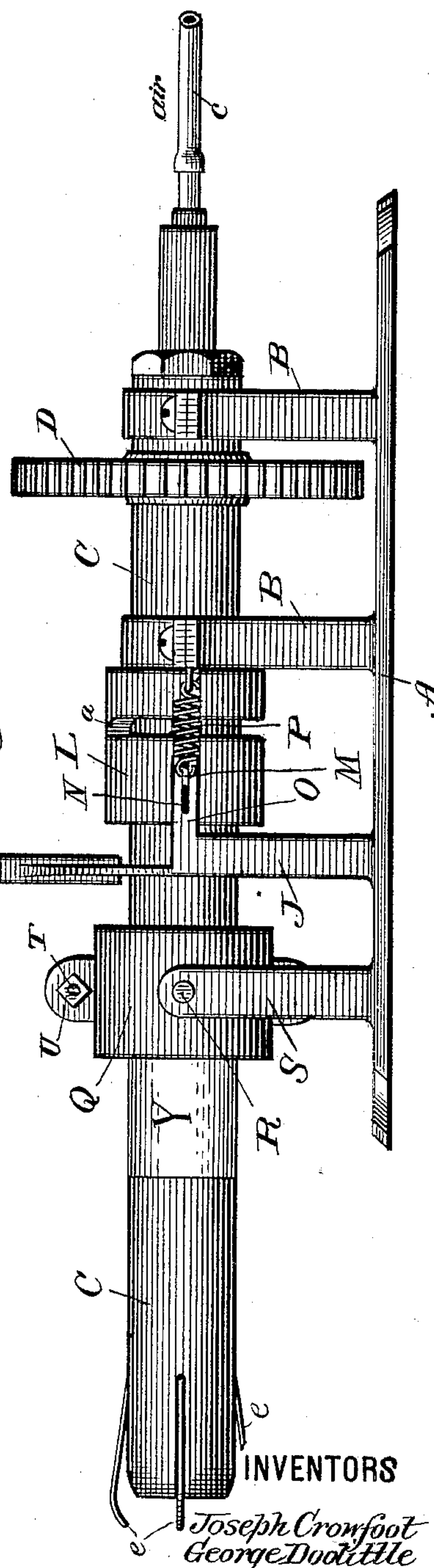
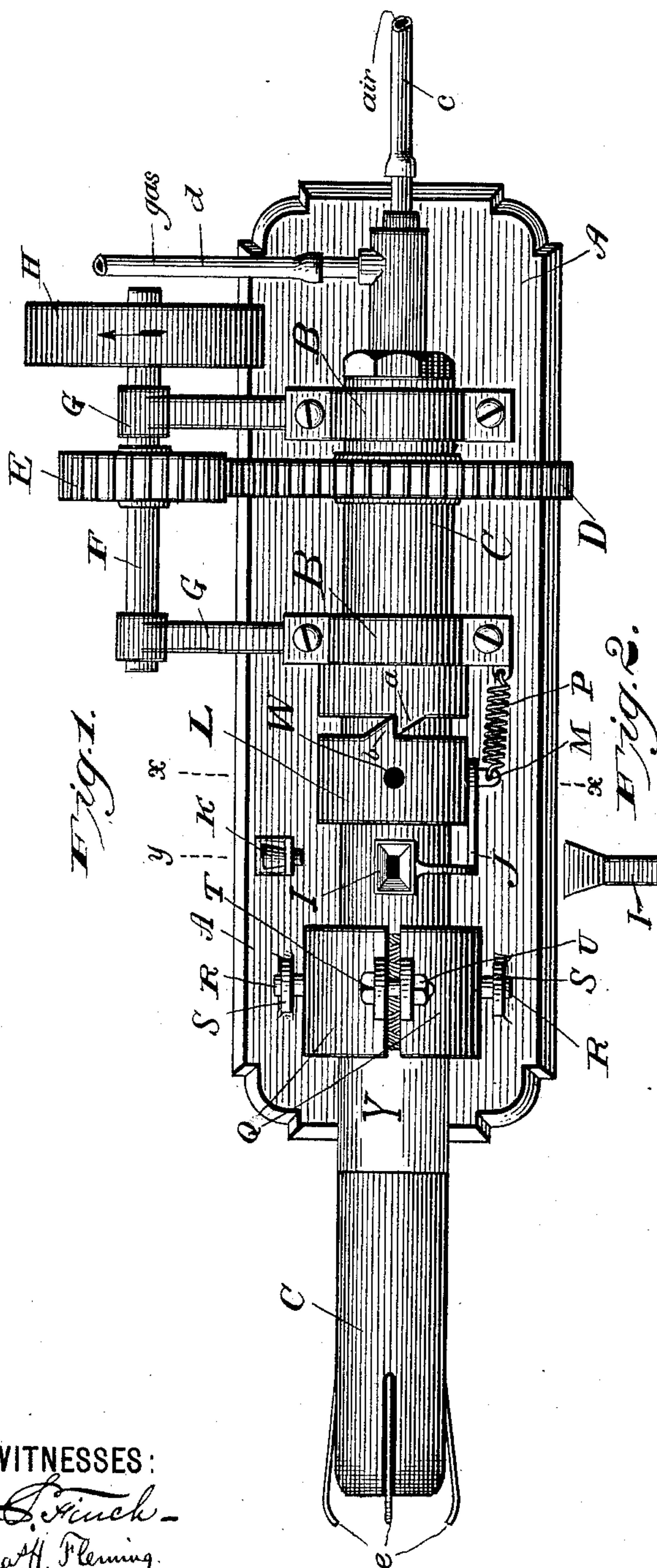
(No Model.)

2 Sheets—Sheet 1.

J. CROWFOOT & G. DOOLITTLE.
MACHINE FOR MAKING WIRE TUBING.

No. 434,920.

Patented Aug. 26, 1890.



WITNESSES:

J. L. Finch
Chas. H. Fleming

INVENTORS

Joseph Crowfoot
George Doolittle

BY

F. W. Smith Jr.

ATT'Y

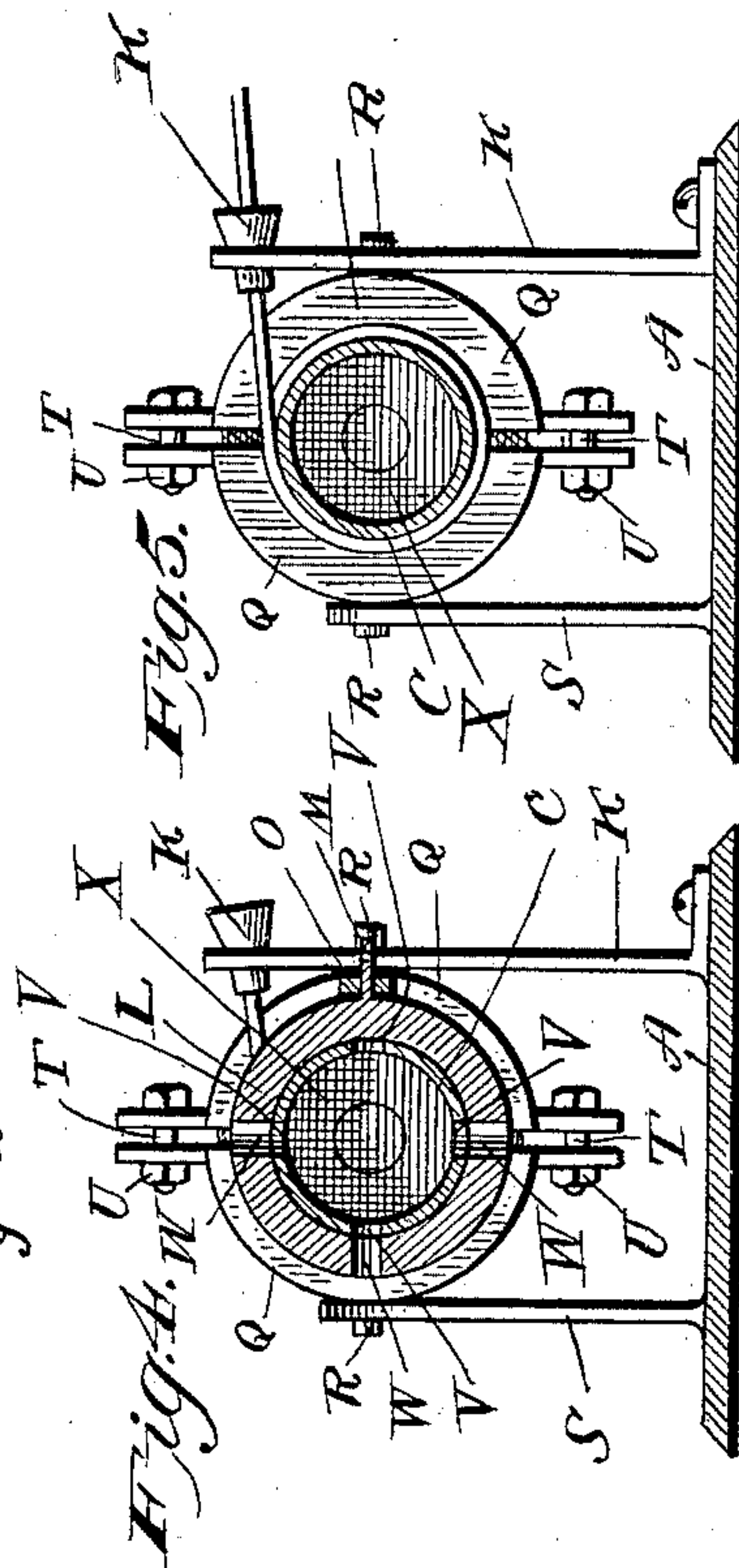
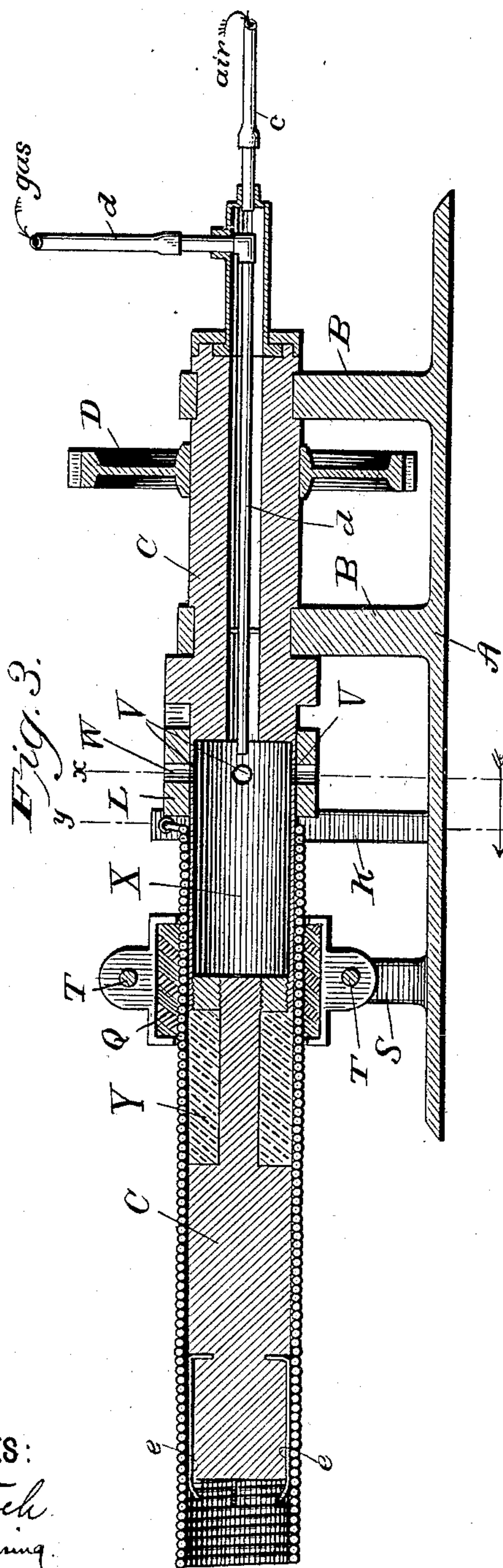
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UNITED STATES PATENT OFFICE.

JOSEPH CROWFOOT AND GEORGE DOOLITTLE, OF BRIDGEPORT,
CONNECTICUT.

MACHINE FOR MAKING WIRE TUBING.

SPECIFICATION forming part of Letters Patent No. 434,920, dated August 26, 1890.

Application filed December 23, 1889. Serial No. 334,614. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH CROWFOOT and GEORGE DOOLITTLE, citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Making Wire Tubing; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to machines for manufacturing wire tubing, and has for its object to provide a simple and effective mechanical organization, and, furthermore, to greatly improve the article of manufacture.

In the accompanying drawings, Figure 1 is a plan of our improvement; Fig. 2, a side elevation; Fig. 3, a central vertical sectional elevation, the wire being coiled upon the mandrel; Fig. 4, a section at the line $x x$ of Figs. 1 and 3, and Fig. 5 a section at the line $y y$ of Figs. 1 and 3.

Similar letters denote like parts in the several figures of the drawings.

A is a bed, from which rise uprights B. C is the mandrel journaled within said uprights, said mandrel being hollow, for the purpose presently explained.

D is a cog-wheel, rigidly mounted on the mandrel and meshing with a cog-wheel E, mounted on a counter-shaft F, which latter is journaled in brackets G, extending from the uprights B.

H is the machine-pulley, which is belted up to any suitable power-pulley. (Not shown.)

I is a solder-box, secured to any suitable post J projecting from the bed, the bottom of said box being above the mandrel. This box is very convenient to hold the sticks of solder, especially when the latter are in such short lengths that they cannot be conveniently manipulated by hand.

We do not, however, wish to be limited to the use of any particular means for holding the solder, since such is not of the essence of our invention, and the solder may be manipulated in stick form by hand, if desired.

K is a guide secured to the bed, and through which the wire is led to the mandrel. In the immediate rear of said guide is a beater L,

which is simply a collar loose on the mandrel, so as to be capable of a free reciprocation thereon. An ear M extends laterally from said collar through an elongated slot N in an arm O, extending from the post J, whereby when the mandrel revolves the beater is secured as against rotary movement, while a reciprocatory movement of said beater lengthwise of the mandrel is permitted by reason of the play which the ear M has within the slot N.

P is a coil-spring, whose ends are connected, respectively, with the ear M and the forward upright B, the function of which spring is to return the beater backward after it has been thrown forward to perform its functions.

Q are wiper-bearings made in two sections and having interior thereof any suitable soft substance, as asbestos. These bearings have pins R extending laterally therefrom and supported loosely within posts S projecting from the bed. The mandrel extends through these bearings, the proper friction being regulated by bolts T and nuts U, which unite the bearings, the latter being contracted or spread apart by tightening or loosening the nuts, respectively. The mandrel is hollow up to that point where the wiper is located, and is provided with vents V, which are normally coincident with vents W in the beater L.

The mandrel in the rear of the beater is provided with an inclined lug a , which is adapted to engage with a similar lug b on the edge of the beater for the purpose of forcing said beater forward. Several of these lugs may be employed, whereby the beater may be operated several times during the revolution of the mandrel.

Immediately beyond the combustion-chamber X in the mandrel the latter is composed of a section Y of porcelain or other material to which solder will not adhere, the office of this section being to cool the tubing. Air and gas are introduced through the pipes c and d , respectively. As fast as the wire is coiled around the mandrel the beater jams the coils tightly together, and the heat from the gas, which has been previously ignited through one of the vents W in the beater, melts the solder as the latter comes in contact with said

coils. The soldered coil, while the solder is yet in a melted state, is forced through the wiper Q by the action of the beater, the result being that the solder is evenly distributed 5 over the surface of the coils, and the completed tubing is rendered uniform. As the tubing is forced over the porcelain section, the solder will solidify without sticking to said section, whereas if a wooden or metallic 10 section were used in this connection the cooling solder would stick to the section and render it impossible to feed the tube along the mandrel. The outer wall of the combustion-chamber X forms the drum on which the wire 15 is initially coiled so that it will be readily understood that the coiled wire will be almost instantly heated to a degree sufficient to melt the superficially-applied solder. As the wire tubing is fed over the end of the mandrel the 20 spring-fingers e secured within the said end and normally distended therefrom will bear against the inside of said tubing with a friction sufficient to prevent any slipping or independent rotary movement of the tubing on 25 the mandrel, so that ample resistance will be afforded, whereby the wire may be wound tightly around the mandrel.

In starting to wind the wire, the free end thereof is held firmly by the operator or by 30 any suitable contrivance, (not shown,) such as would be deemed an ordinary expedient. After the tubing has extended beyond the mandrel, no holding of the wire is necessary, since the spring-fingers e automatically per- 35 form this function. The tubing is run in suitable lengths and cut off beyond the spring-fingers. By encircling the tubing with the wiper the former is wiped in two directions—namely, in the direction of the coils as the 40 mandrel revolves and transversely to said coils as the beater is operated—and to this action of the wiper alone is due the fact that we produce by means of our hereinbefore-described machine a tubing of wire superior in 45 finish to anything of the kind heretofore known.

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

1. In a machine for making wire tubing, a 50 revoluble mandrel provided with an interior combustion-chamber, the walls whereof constitute the drum around which the wire is coiled, and means for feeding the coiled wire along the mandrel, substantially as set forth. 55

2. In a machine for making wire tubing, a mandrel comprising a heated drum on which the wire is coiled and soldered, and a section of porcelain or the like whereon the soldered 60 coils are cooled, in combination with means for feeding the coiled wire along the mandrel, substantially as set forth.

3. In a machine for making wire tubing, the combination, with the mandrel provided with a heated drum on which the wire is coiled 65 and soldered, of a wiper encircling said mandrel beyond said drum, and means for forcing the soldered coils through said wiper, substantially as shown and described.

4. In a machine for making wire tubing, 70 the combination, with the beater adapted to slide freely over the mandrel, and provided on the rear edge with a projecting incline and at the side with a laterally-extending ear, of the stationary arm O, having therein an 75 elongated slot N, through which said ear extends, whereby the beater is secured as against rotary movement, the mandrel having a similar incline adapted to engage with the first- 80 named incline, whereby the beater is forced forward, and a spring for returning the beater to normal position, substantially as set forth.

5. In a machine for making wire tubing, the combination, with a rotary mandrel, of 85 means for feeding the tubing along the mandrel, and spring-fingers distended from the mandrel to press against the inner wall of said tubing, whereby a friction is exerted against the latter to prevent independent rotation thereof, substantially as set forth. 90

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH CROWFOOT.
GEORGE DOOLITTLE.

Witnesses:

F. W. SMITH, Jr.,
J. P. FINCH.