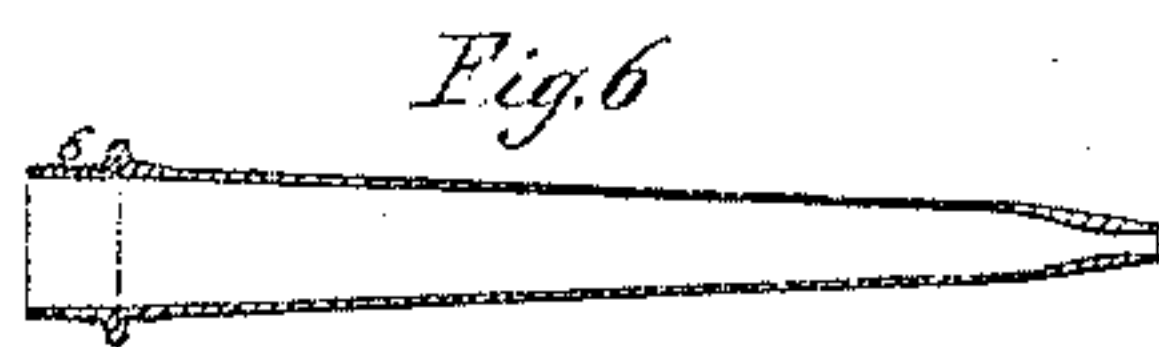
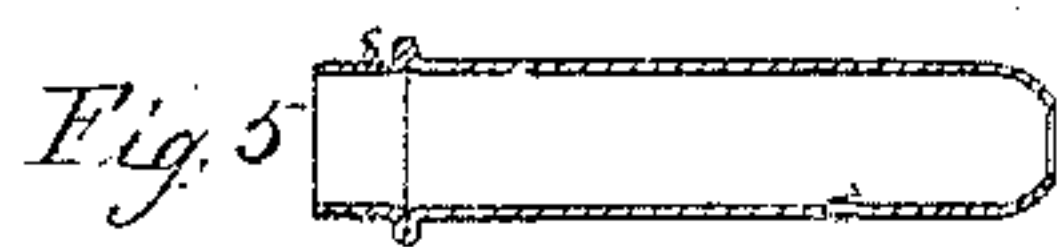
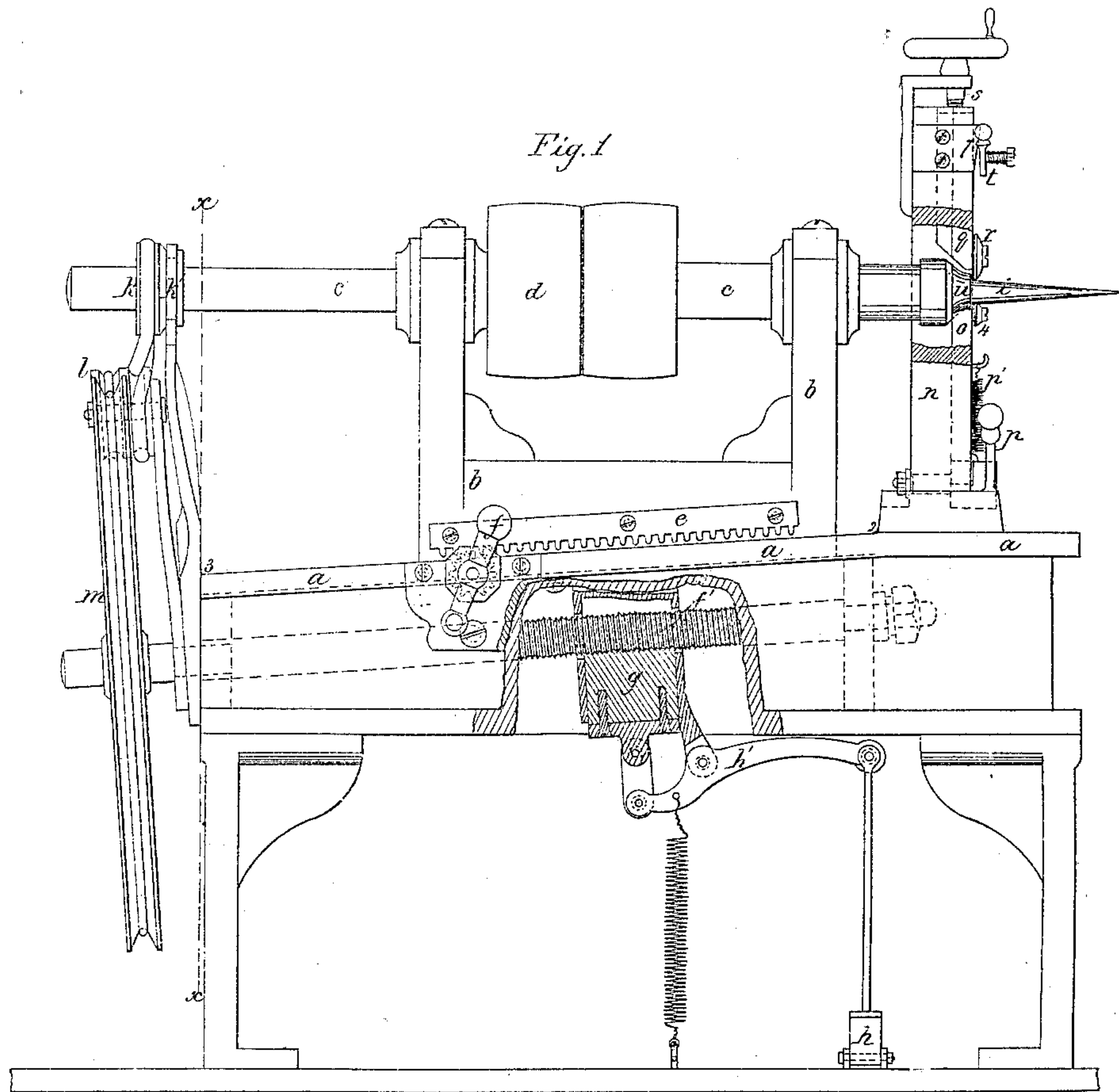


F. J. Seymour.

Sheet Metal Spinning.

N<sup>o</sup> 86,182.

Patented Jan. 26, 1869.



Witnesses:  
Geo. D. Walker  
Chas. H. Smith

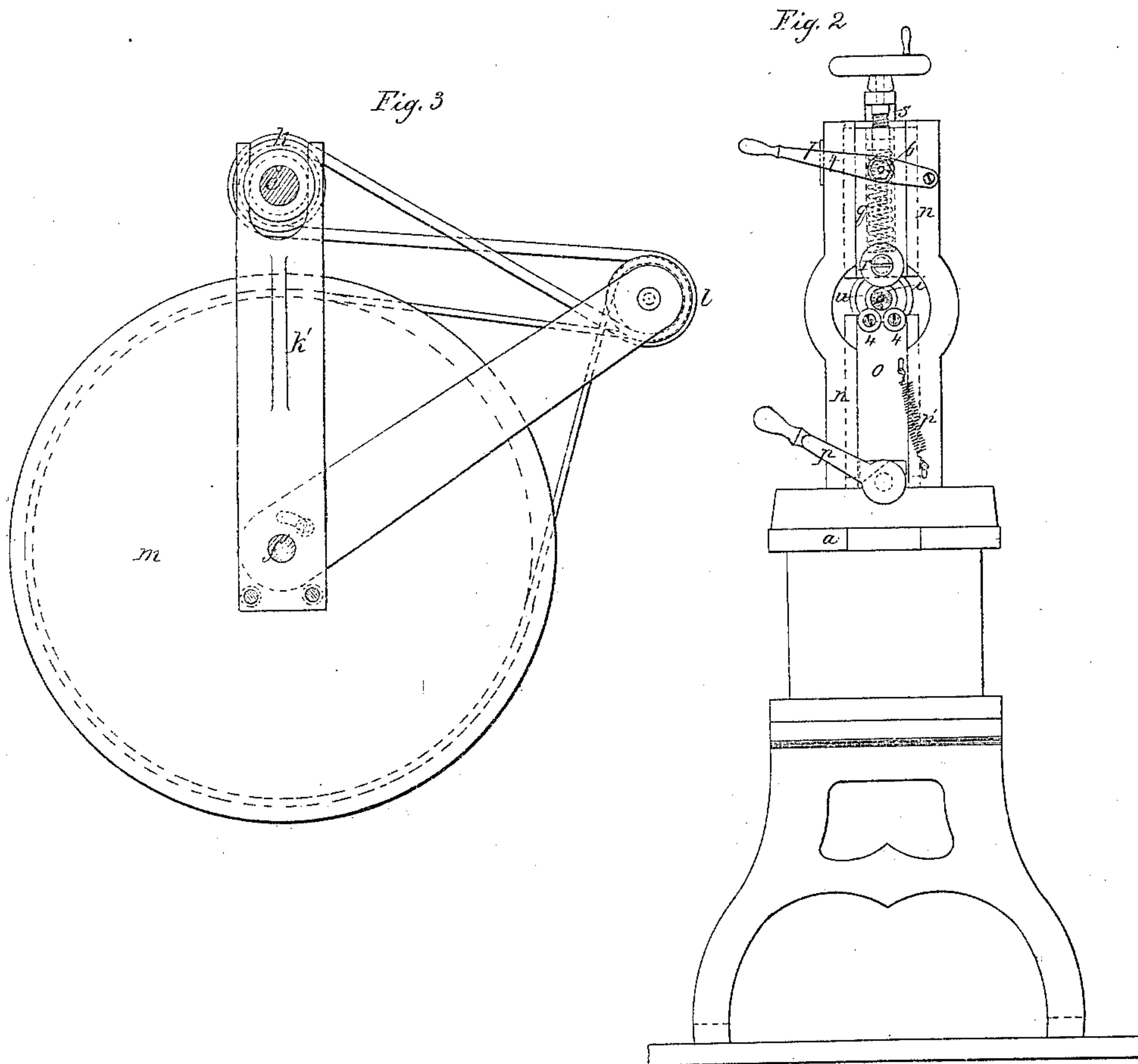
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Geo. D. McKee  
Chas. H. Smith

Inventor  
F. I. Seymour  
per L. W. Duell



# United States Patent Office.

FREDERICK I. SEYMOUR, OF MERIDEN, CONNECTICUT, ASSIGNOR  
TO HIMSELF AND E. MILLER & CO., OF SAME PLACE.

Letters Patent No. 86,182, dated January 26, 1869.

## IMPROVEMENT IN MACHINE FOR SPINNING TAPERING TUBES OF SHEET-METAL.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, FREDERICK I. SEYMOUR, of Meriden, in the county of New Haven, and State of Connecticut, have invented, made, and applied to use, a certain new and useful Improvement in Spinning Tapering Tubes of Sheet-Metal; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a side view of the machine employed for spinning said tubes, part of the bed being removed to show the screw-clamp sectionally, and the head-block being broken open.

Figure 2 is a view endwise of the mandrel and former.

Figure 3 is a section at the line *xx*, showing the belts and pulleys to the screw of the mandrel-head.

Figures 4, 5, and 6 represent in section the successive stages in the formation of sheet-metal tube.

Similar marks of reference denote the same parts.

Heretofore the tapering tubes forming the spouts of oil-cans, lubricators, lightning-rod tips, bayonet-sheath tips, &c., have been made of sheet-metal bent up to shape and soldered or brazed. This operation is costly, tubes are not strong and often become leaky, and frequently the small tubes are closed by the solder or other alloy employed in making a joint.

The nature of my said invention consists in mechanism for reducing cylindrical or nearly cylindrical tube down to the taper of a mandrel or former by a spinning operation, which lengthens the tube at the same time that it imparts the desired tapering shape.

To effect these operations, a tube of metal is attached at the larger end of a tapering mandrel, and revolved rapidly while being acted upon by a roller or tool, to reduce and spin the metal down to the shape of the tapering former, a pair of rollers, or other support, being employed to sustain the former and tube while being operated upon.

In the drawing—

*a* represents a bed, upon which is mounted a head, *b*, carrying a mandrel, *c*, rotated by power applied to a pulley, *d*.

*e* is a rack, acted upon by the crank *f* and a pinion, to slide the head *b* and mandrel along, previous to commencing the spinning-operation.

The bed *a* has a surface, on which the head *b* slides, that is inclined between the points 2 and 3 for a purpose hereafter named.

The screw *f'*, that moves the head *b* along during the spinning-operation, is connected to the head by the half-nut *g* that is brought into operation by the treadle *h* and lever *h'*, the screw *f'* revolving continuously by a connection to the mandrel *c*, that is formed through the pulleys and bands *k*, *l*, and *m*. (See fig. 3.)

The pulley *k* is fitted with a feather in a groove in

the mandrel *c*, so as to be rotated thereby, and at the same time allow the mandrel to slide through it, said pulley *k* being held in the fork *k'*, that allows the pulley to rise and fall with the spindle, as it rises or sinks, as the head *b* and mandrel are moved along the inclined portion of the bed *a*.

The head-block *n* is fitted to receive the slide *o* that carries the rollers *x x*, and a lever, *p*, is provided, with an eccentric or cam-shaped hub, by which to raise or lower the slide *o* and rollers *x x*, and *p'* is a spring to draw said slide *o* down, when relieved, by moving the lever *p*.

*q* is a slide, carrying the roller *r*, or other tool, to spin the sheet-metal tube.

*s* is a screw and hand-wheel to operate upon a nut (shown by dotted lines) within the slide *q*, and regulate the force of a spring (shown also by dotted lines) that is within a cylindrical cavity in the slide *q*, so that the force with which the roller or tool *r* is pressed upon the sheet-metal tube will depend upon the amount of compression of the spring by the screw *s* and its nut.

*t* is a lever on a fulcrum at 6, and operating, when latched at 7, to hold up the slide *q* and roller *r*.

The tapering mandrel or former *i* is attached at the end of the mandrel *c*, and is adapted to receive, at its larger portion, the base of the tube of sheet-metal to be tapered. This tube is shown in fig. 4, and is to be drawn down from a sheet-metal disk, or otherwise, by any known means, such, for instance, as the dies employed in the manufacture of metallic cartridge-cases, and the tube may be open entirely at the end, or slightly contracted, as seen in figs. 4 and 5.

The collar *8* and screw for attaching the tube to a lubricator may be formed upon the sheet-metal tube, as seen in fig. 5, before or after the tube is tapered, or dispensed with when not required.

The opening that is left in the head-block *n*, between the slides *o* and *q*, allows the former *i* to be protruded through said head-block in the position shown in fig. 1, the slide *q* being drawn up out of the way and the slide *o* depressed.

The tubular blank, fig. 4 or 5, is slipped over the former *i* and firmly secured thereto by a screw-thimble, *u*, or other device, which clamps it to the base or larger end of the former *i*. The tube and mandrel are then revolved rapidly by means of the mandrel *c*, the feed-motion, by the screw *f'*, brought into action by the treadle *h*, the slide and supporting-rollers *x x* brought up by the lever *p*, and the roller or tool *r* put into action by disengaging the lever *t* from the latch 7, and the spinning, reduction, and elongation of the cylindrical pipe into a tapering tube progresses from the larger to the smaller end of said tube. During this operation, the head *b* drawing back and down the incline between 2 and 3, keeps the under side of the tapering tube properly in contact with the supporting-rollers *x x*, compensating by this movement for the



decrease in the diameter of the part that is being supported, and the roller or tool *r* is moved down, and continues its operation by the action of the spring contained in the slide *q*.

It will be apparent that the slide *o* and rollers *x x*, or other supports, might be operated upon by springs, or their equivalents, in place of employing the inclined surface 2, 3 of the bed *a* to keep the tube in contact with the rollers 4, 4, and that the levers *p* and *t*, when acted upon by hand or by the adjustment of the spring, can be made to draw the metal down thinner, as it is spun, or leave it thicker, as desired.

I prefer to run each tapering tube through twice. In the first reduction, the tube will not be stretched to the end of the former *i*. In the second reduction, the tube will be made thinner and its end carried out beyond the end of the former *i*, which will leave the very end of the tube thicker than it would be if extended upon a former, and it can be spun down by the rollers, so as to compress the tube and leave any desired size of opening to the small end of the tube.

The former *i* might be dispensed with if it is desired simply to taper the tube and not elongate it, in which

case the tube will be thickened and the operation will not be as perfect as when the former is employed.

What I claim, and desire to secure by Letters Patent, is—

1. Lengthening and reducing tubes of metal, while held and rotated by means of a reducing-roller or tool and supporting-rollers, or their equivalents, applied substantially as specified.

2. The supporting-rollers 4, 4 and reducing-roller *r*, in combination with a tapering former, to which the tube to be reduced to a taper is held while being rotated and acted upon by the roller or tool *r*, substantially as set forth.

3. The arrangement of the head-block *n*, slides *q* and *o*, and rollers *x x* and *r*, in combination with the tapering former *i* and the head *b*, fitted to move down the inclined surface 2, 3 of the bed *a*, substantially as and for the purposes specified.

In witness whereof, I have hereunto set my signature, this 21st day of July, 1868.

Witnesses: FRED'K I. SEYMOUR.

WM. H. PERKINS,  
WATSON W. CLARK.