

No. 719,443.

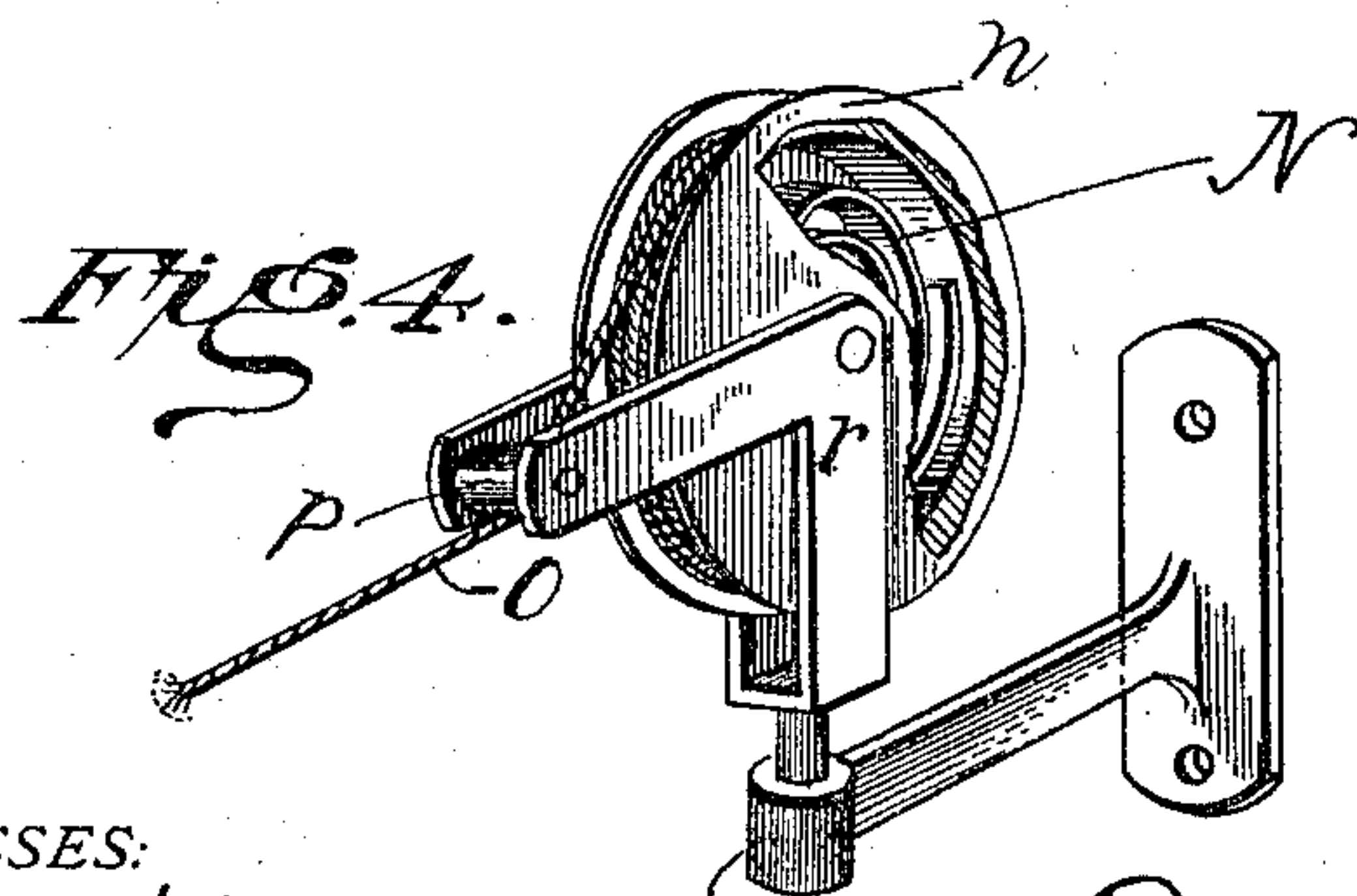
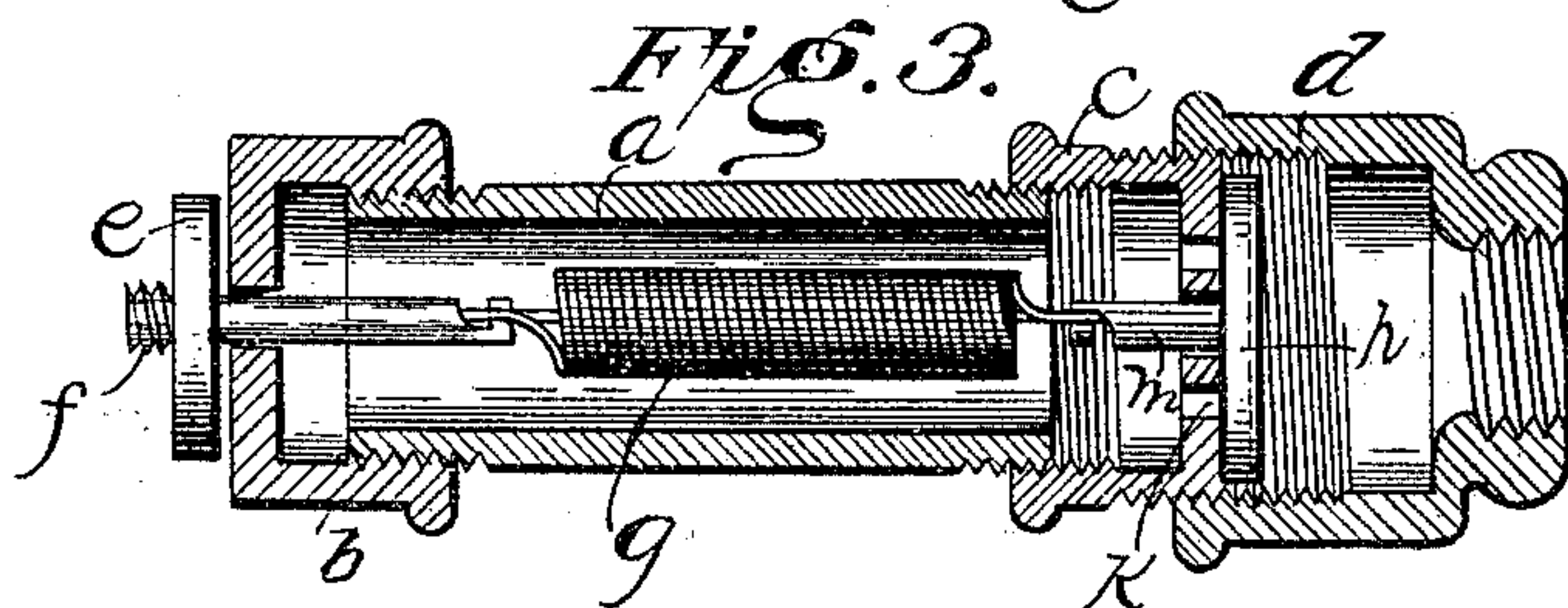
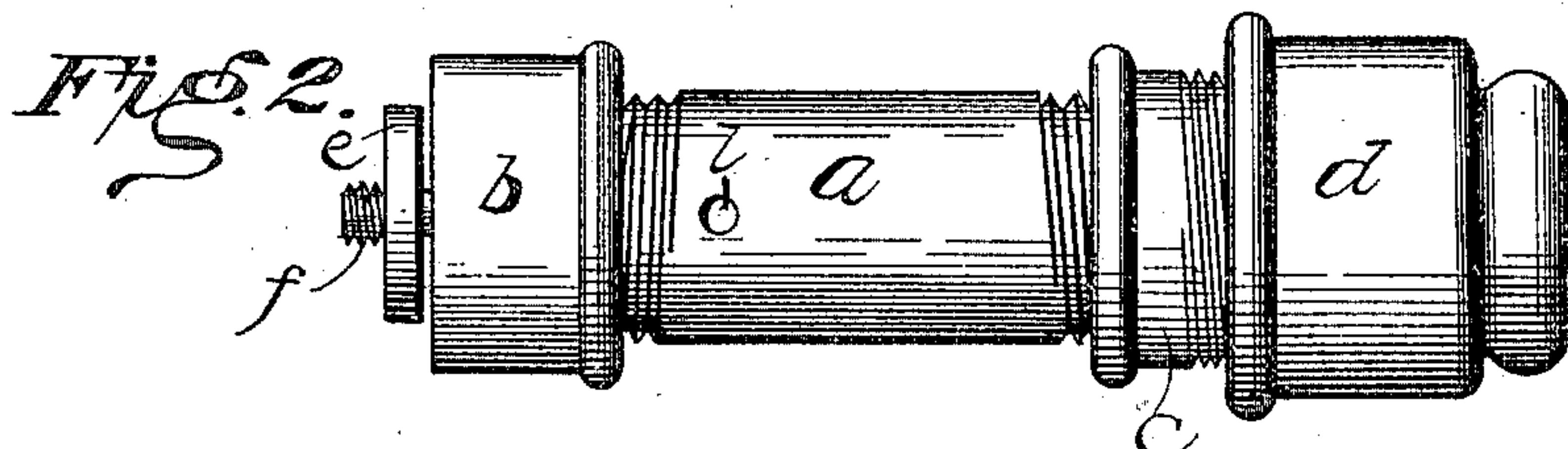
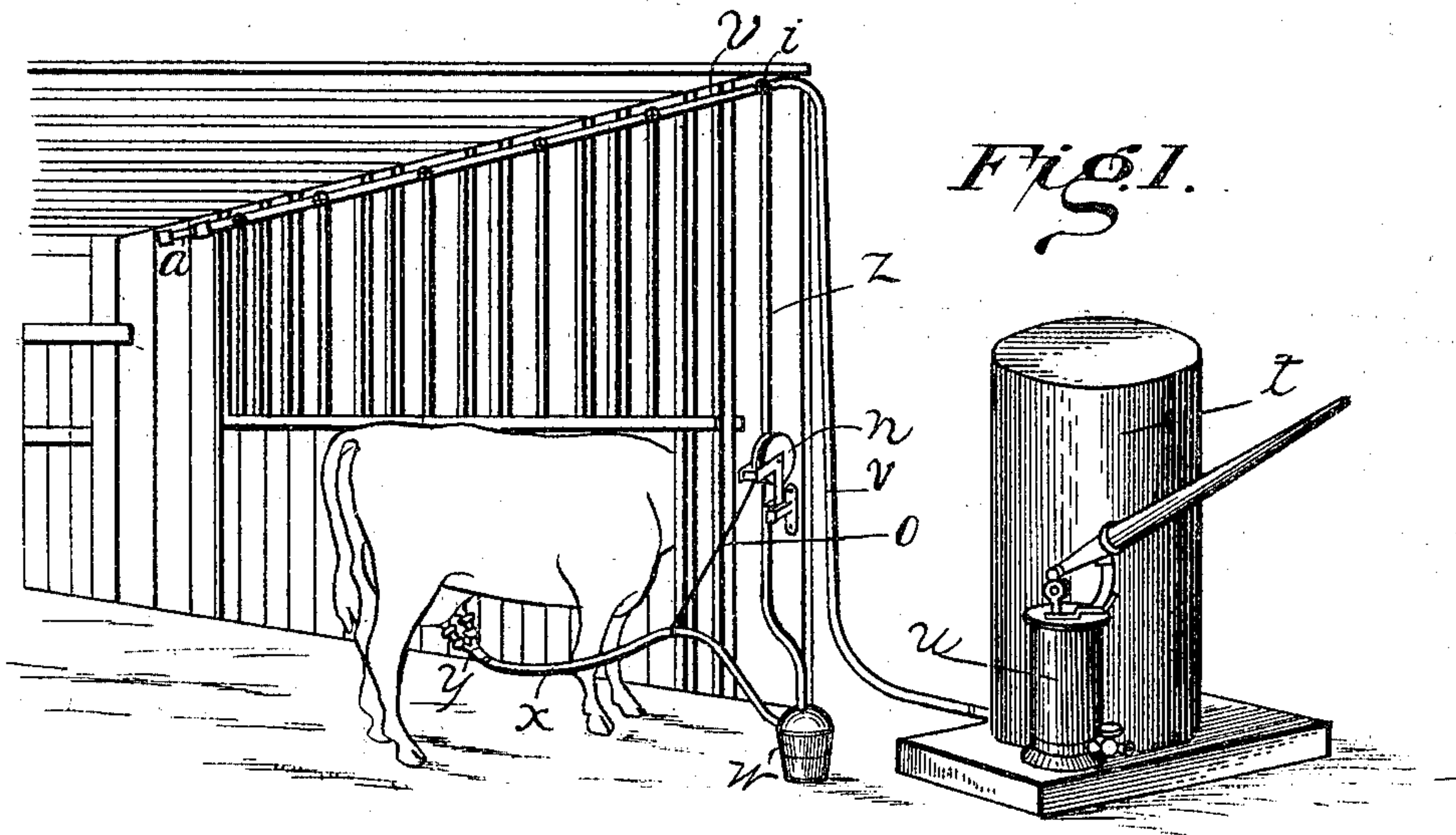
PATENTED FEB. 3, 1903.

F. M. DEVORE.

# VACUUM REGULATING DEVICE FOR MILKING MACHINES.

APPLICATION FILED MAY 2, 1902.

NO MODEL.



*WITNESSES:*

J. R. Martin.  
A. C. Fowler.

*INVENTOR:*

Francis M. Devore,  
by Colburn & Co.,  
Attorneys.



# UNITED STATES PATENT OFFICE.

FRANCIS M. DEVORE, OF THOMPSON, IOWA.

## VACUUM-REGULATING DEVICE FOR MILKING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 719,443, dated February 3, 1903.

Application filed May 2, 1902. Serial No. 105,610. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS M. DEVORE, a citizen of the United States of America, and a resident of Thompson, Winnebago county, Iowa, have invented certain new and useful Improvements in Vacuum-Regulating Devices for Milking-Machines, of which the following is a specification.

My invention relates to apparatus for maintaining and regulating vacuums in cow-milking machines; and the objects of my improvements are to furnish a small and simple regulator whose function shall be to maintain a vacuum of the same constant degree without fluctuation in the hose leading to the teat-cups.

To this end the invention consists in the arrangement and combination of parts, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the views, Figure 1 is a perspective view of a cow-milking machine embracing my improvements. Fig. 2 is a view of the exterior of my vacuum-regulating device. Fig. 3 is a longitudinal sectional view of the same, and Fig. 4 is a perspective view of the device for regulating the tension upon the milk-hose preferably employed by me.

Air is exhausted from the vessel *t* by means of an air-pump *u*. The same degree of vacuum exists in the communicating hose and pipes *v* *z*, the receptacle *w*, and milk-hose *x* and in the teat-cups *y*. By means of a valve in the pipe *z*, operated by the turning of the hand-wheel *i*, said pipe may be closed when milking is finished. A tension device, represented by a pulley *n*, containing a coiled tension-spring *N*, mounted within a frame *r*, which is swiveled upon a bracket *s*, and having a guiding-pulley *p* set within its frame, is attached to some part of the stanchion. A loop at the end of the cord *o*, which passes about said pulley *n*, is placed around the milk-hose *x*, and when the teat-cups *y* are attached to the cow's teats the tension on said milk-hose is kept constant by means of the pull of the spring in the pulley *n*, responsive to all

movements of the animal, free from jerkiness, and not exerting a painful draft upon the teats. In order to maintain an equal degree of vacuum in the milk-hose and connections, as free as possible from pulsations or fluctuations in pressure, I have provided a vacuum-regulating device constructed as follows: A chamber is formed by placing adjustable caps *b* and *c* upon the tube *a*. Air is permitted to enter this chamber through the hole *l*. The cap *b* is centrally tapped to allow of the passage through it of the adjustable spindle *f*. Openings *k* are tapped through the head of the cap *c*, and a central opening is also tapped within the same head to allow of the passage through it of the valve-spindle *m*. The inner ends of both the spindles *f* and *m* are hooked and are connected by means of a spring *g*, which serves to keep the valve *h* normally in contact with its seat over the openings *k*. A reducing union-coupling *d* serves to connect the regulator to the vacuum-pipe *v*, as at its farther end. The spring *g* may be brought to any required tension by means of the use of the thumb-piece or nut *e* on the spindle *f*. When the tension has been properly adjusted to suit, any degree of vacuum in the pipe *v* greater than that desired will allow the atmospheric pressure in the regulating-chamber *a* to push in the valve *h*, permitting air to enter the vacuum-pipe until the equality is restored. A constant and un pulsating suction of the required degree is thus brought to bear upon the cow's teats, the teats are not drawn down tightly and painfully into the teat-cups, and a freer issue of milk results. The combination of these two improvements—viz., the equalization of tension upon the milk-hose and the regulation of tension within the teat-cups—thus does away with all cause for uneasiness and restlessness of the cow.

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

1. A vacuum-regulating device for milking-machines, which consists of an air-chamber having a perforated body, a perforated cap adjustable thereon, a valve adapted to close the perforations in said cap, means for adjustably regulating the tension on said valve,

and a suitable tubular connection between said air-chamber and the milk-hose, substantially as shown and described.

2. A vacuum-regulating device for milking-  
5 machines, which consists of an air-chamber composed of a perforated tube having adjustable caps, one of said caps tapped to permit of the passage therethrough of a tension-regulating spindle, the other cap being provided  
10 with air-passages and also with an opening to permit of the passage therethrough of a valve-spindle, a valve adapted to close the passages for air in the latter cap, a spindle

for said valve, a tension-regulating spindle, a spring connecting the valve-spindle to the  
15 tension-regulating spindle, a coupling connecting the valve-seat to the vacuum-pipe, and suitable tubular connections between said coupling and the milk-hose, all substantially as shown and described. 20

Signed at Thompson, Iowa, this 25th day of April, 1902.

FRANCIS M. DEVORE.

Witnesses:

ALBERT SÜHRING,  
ADDIE CAMERON.