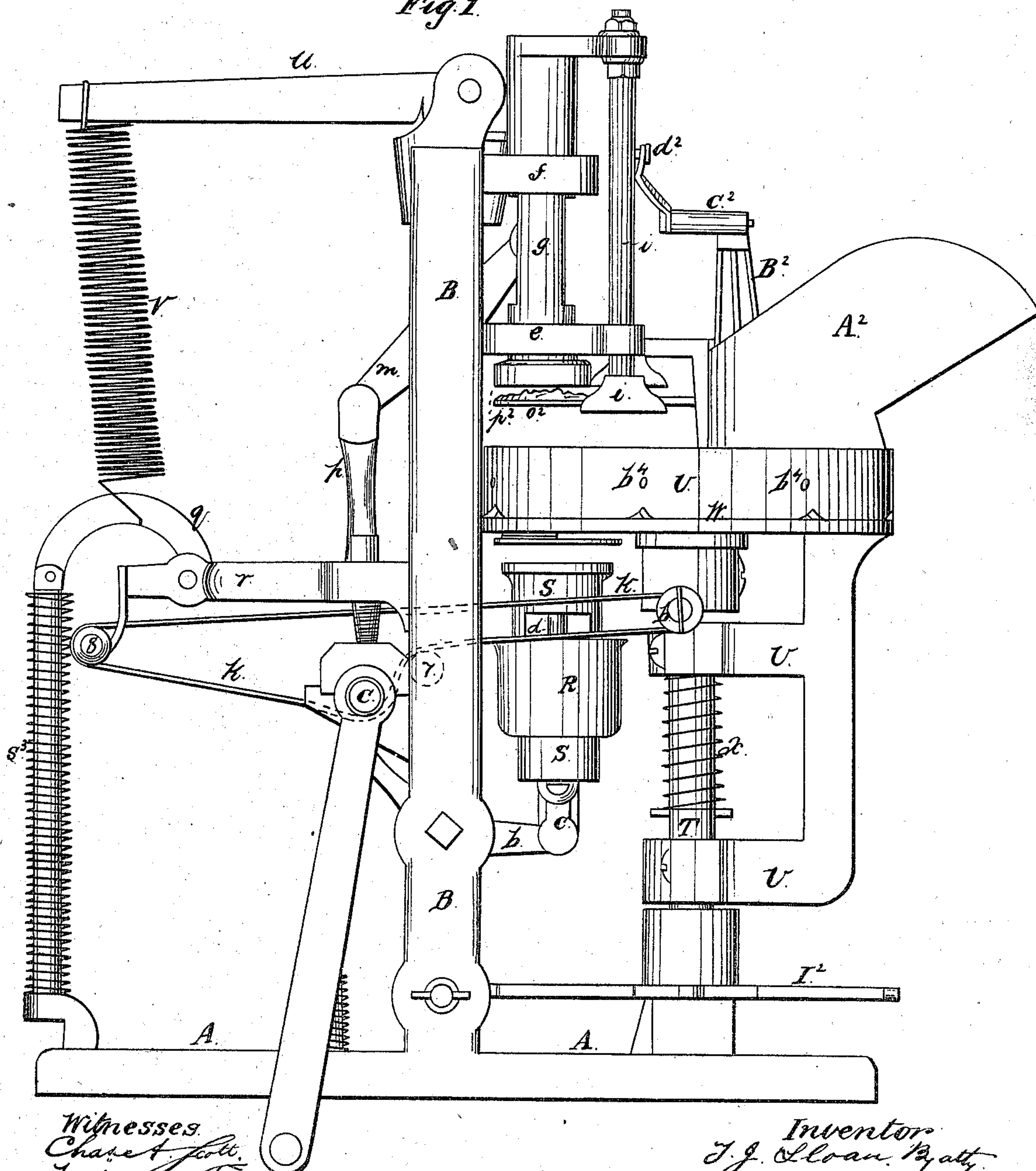


N^o 94, B49.

Patented Sept. 14, 1869.

Fig. 1.



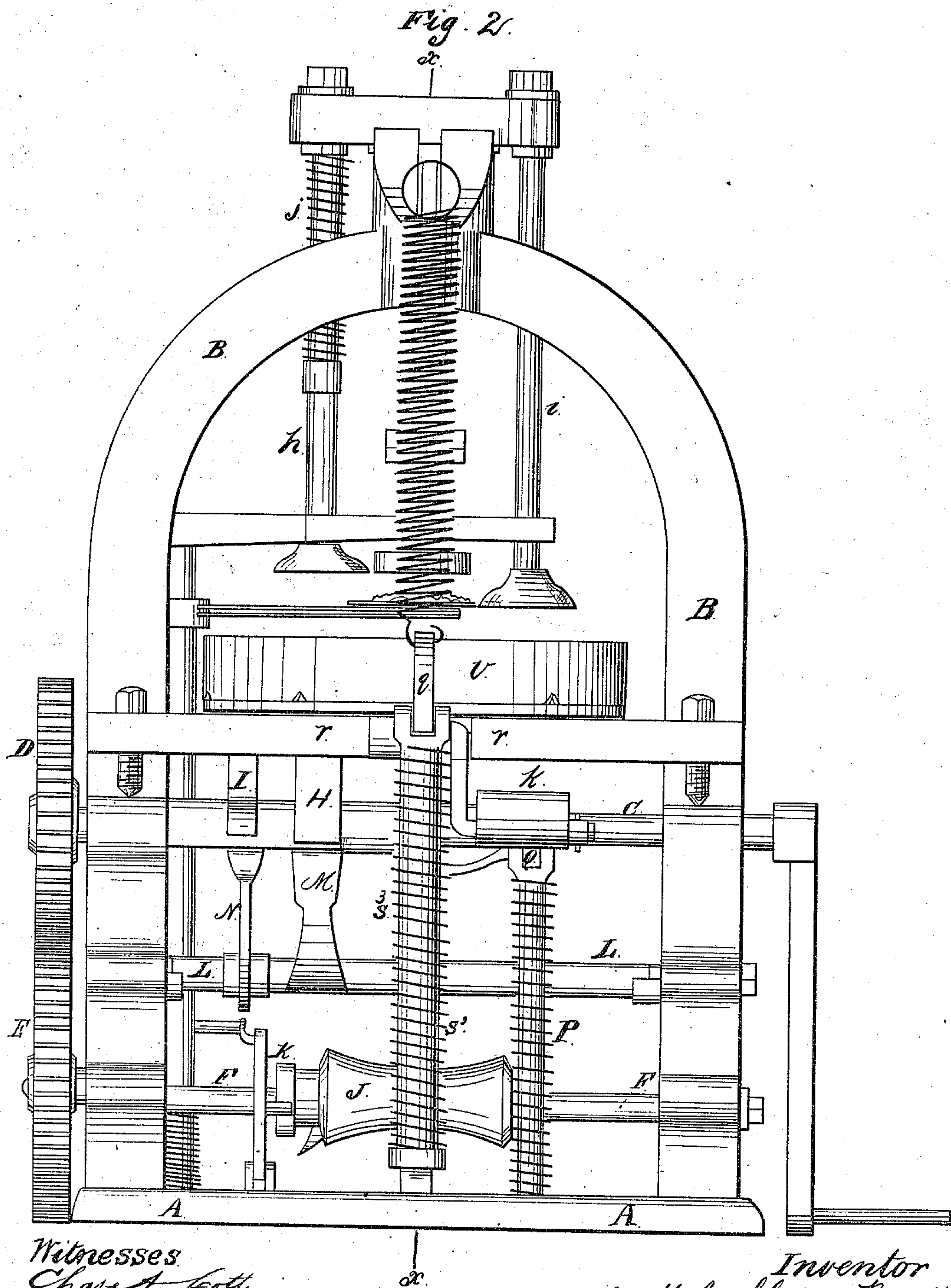
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Knob Molding Mach.*

N^o 94,849.

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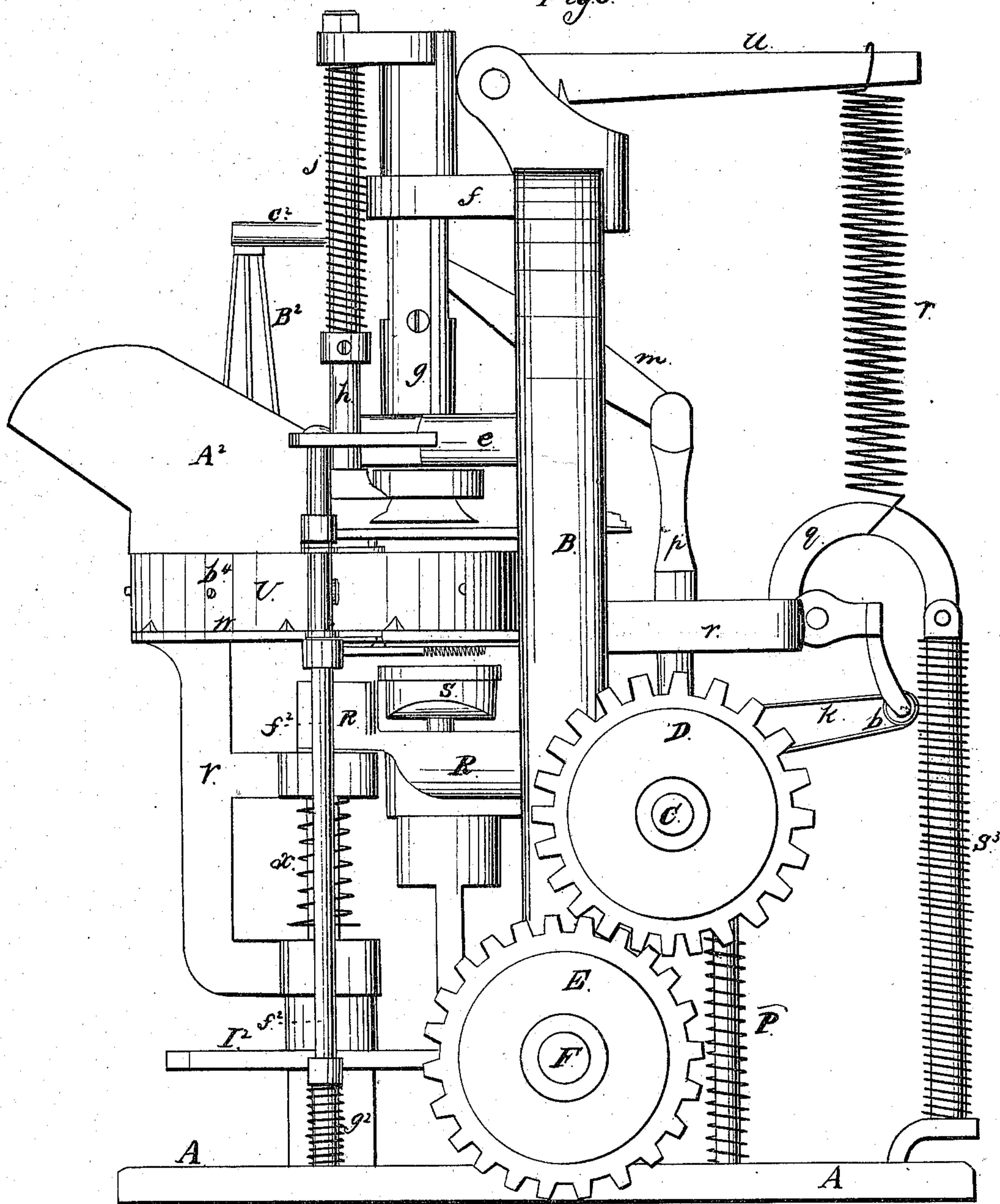
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N^o 94,849.

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Fig. 3.

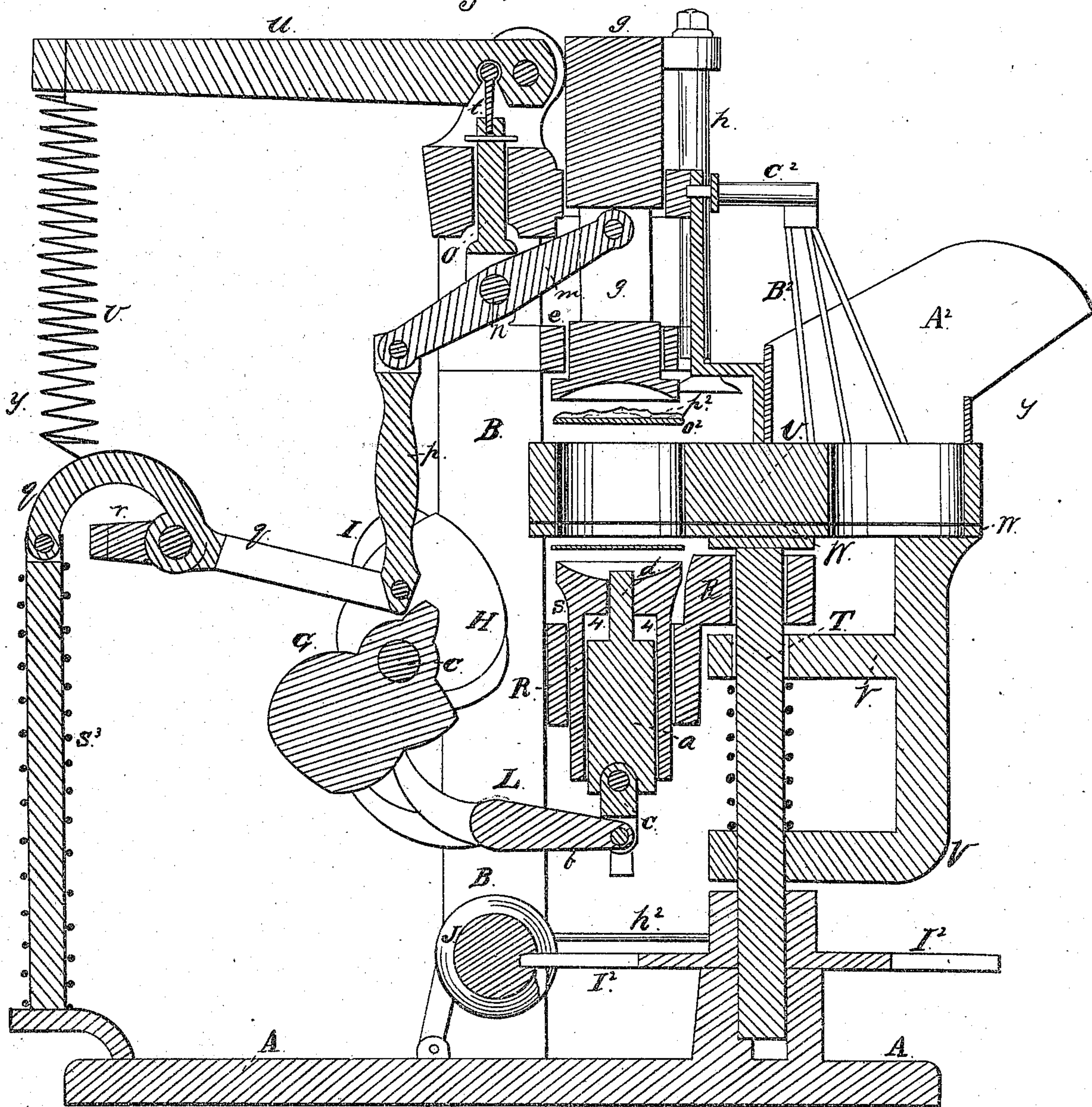


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Fig. 4.



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Fig. 5.

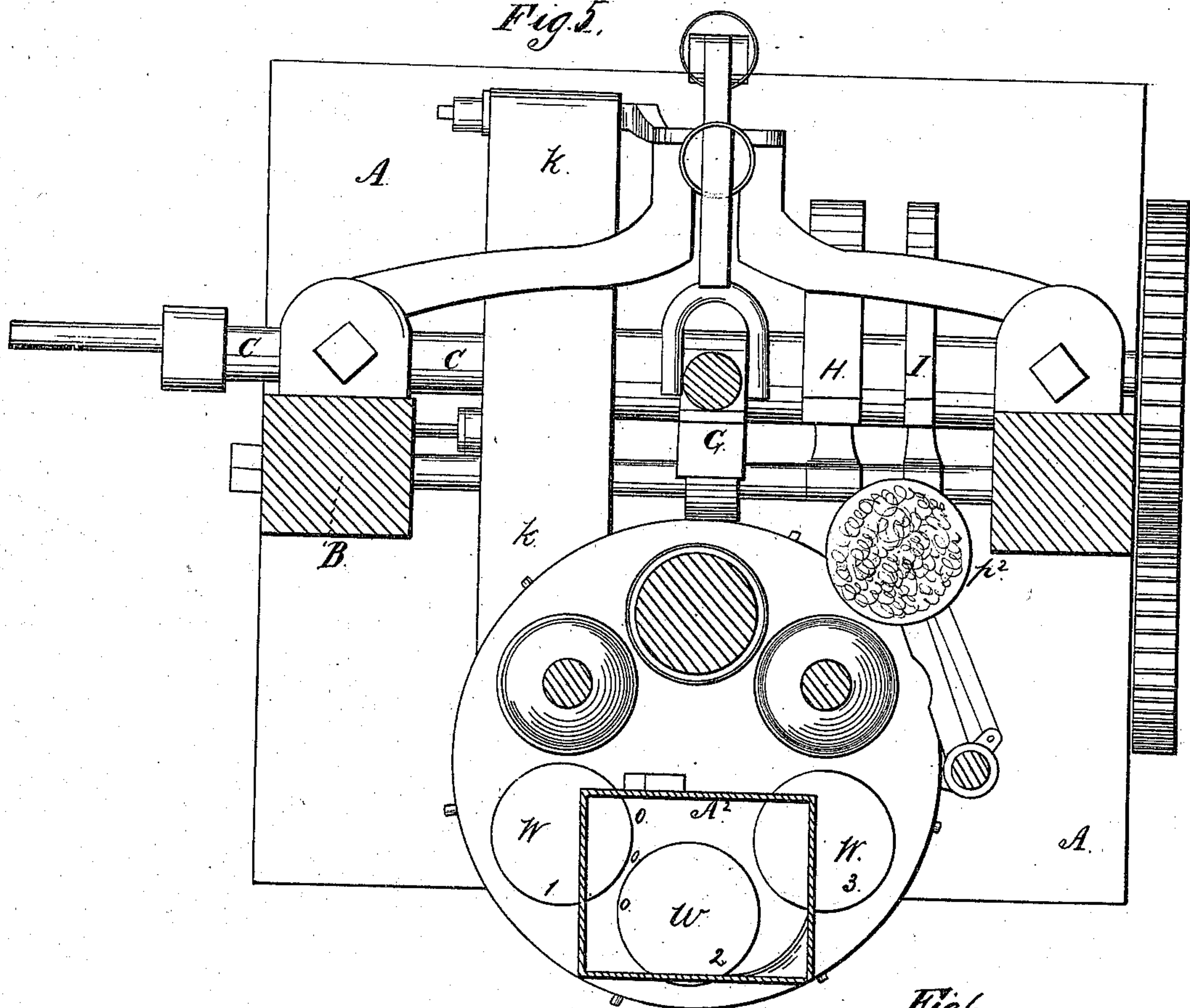
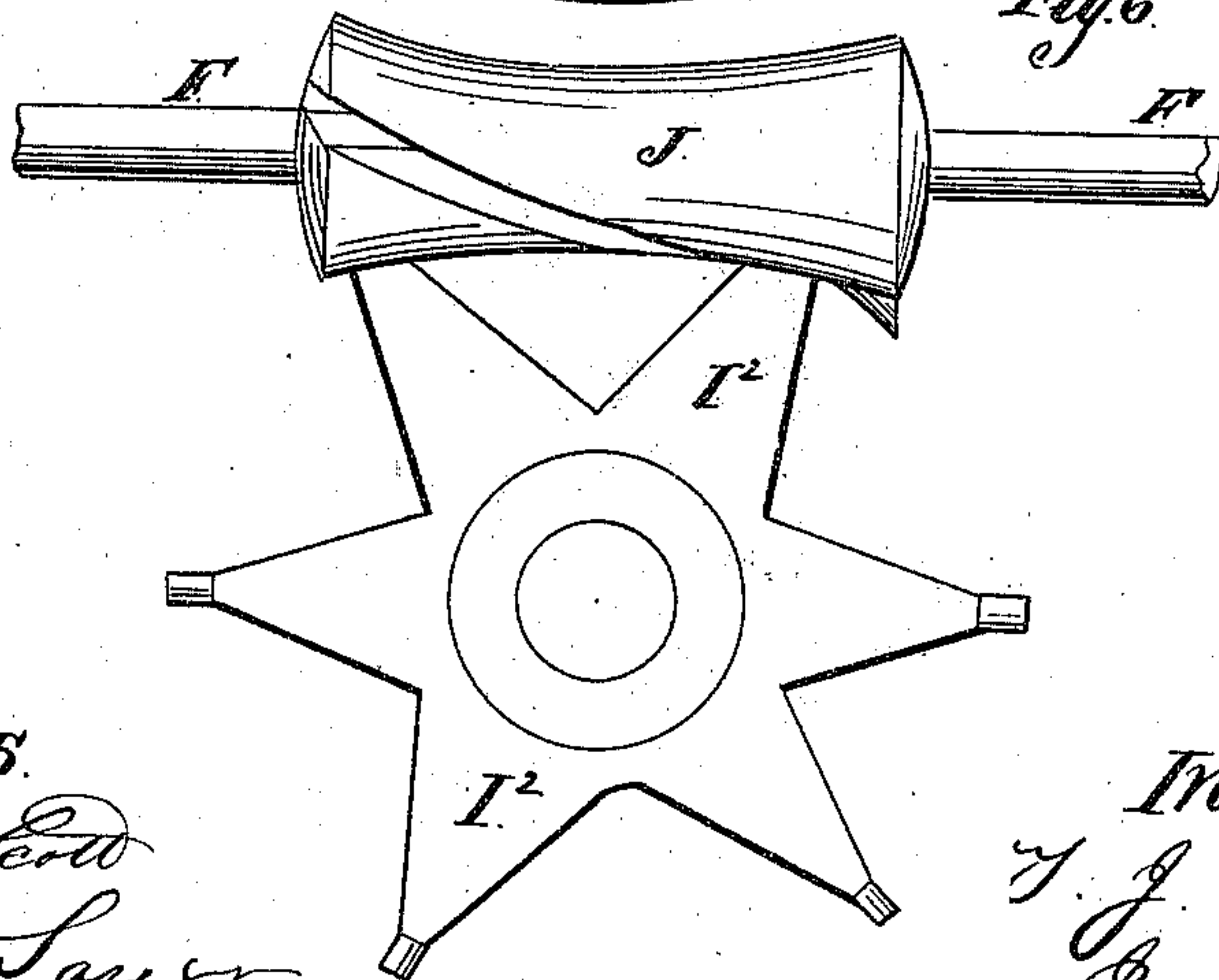


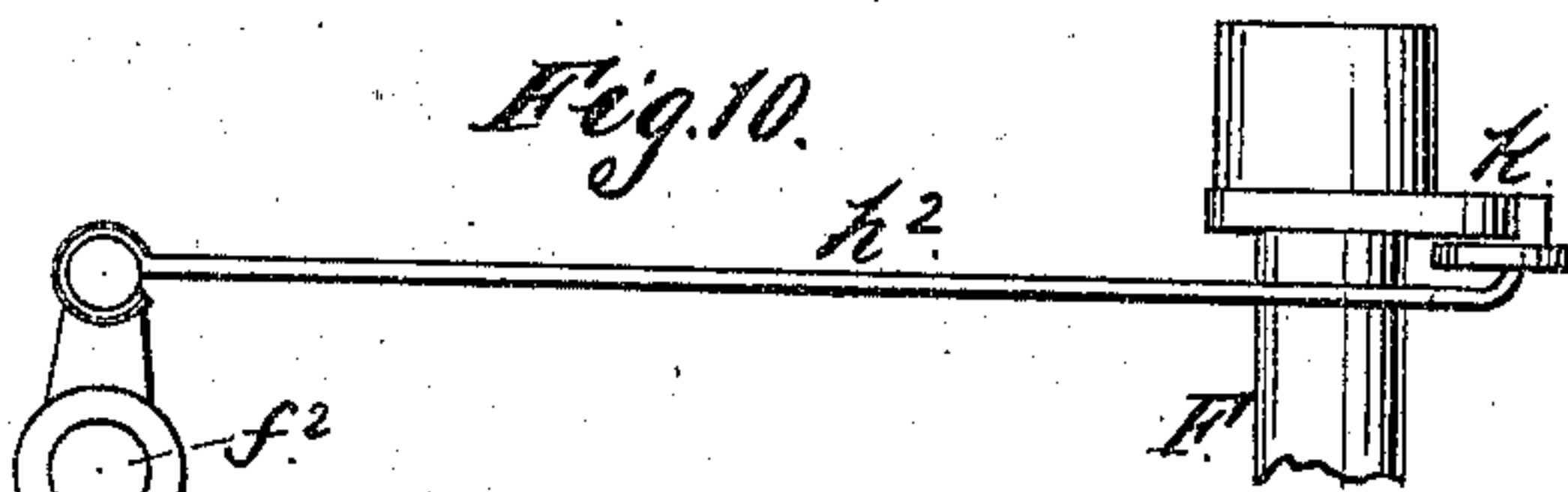
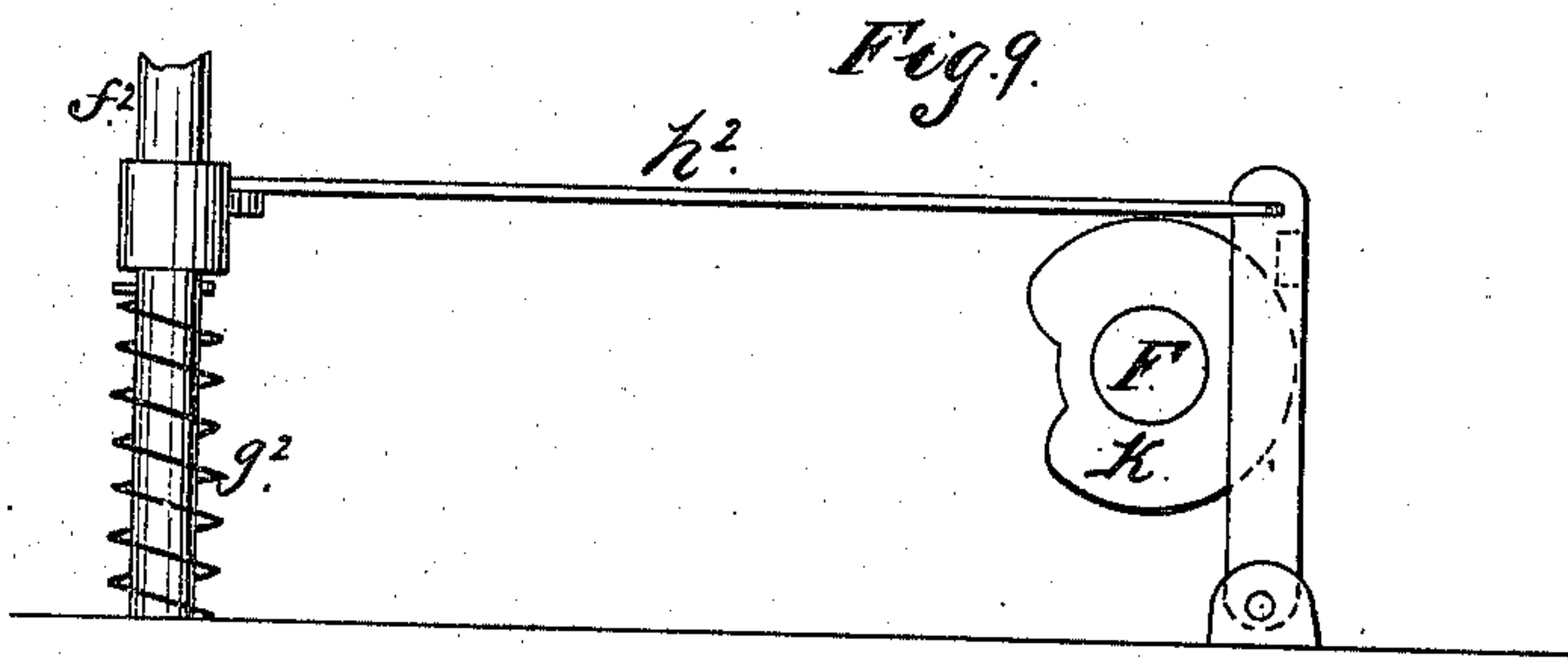
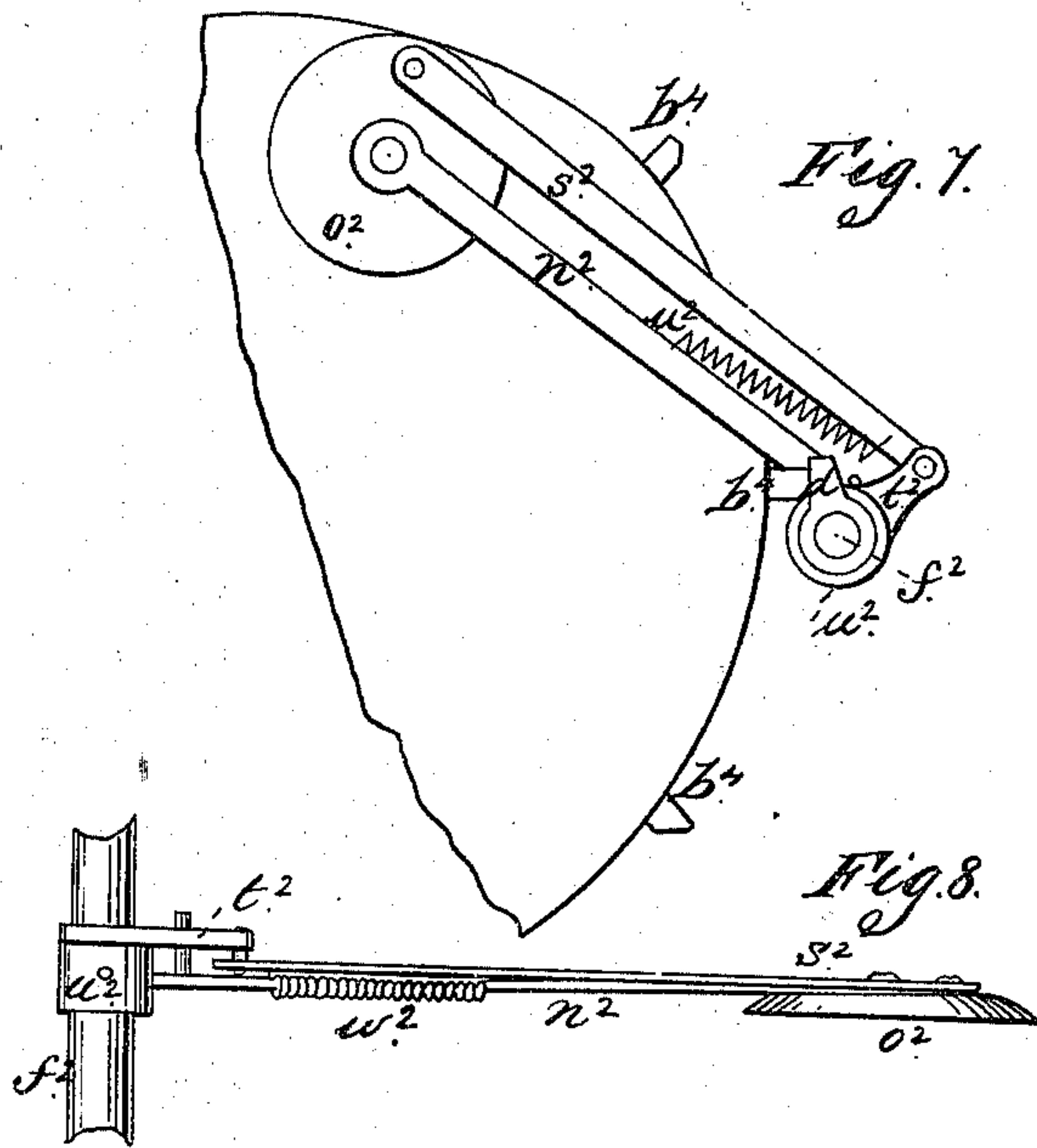
Fig. 6.



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United States Patent Office.

THOMAS J. SLOAN, OF NEW YORK, N. Y.

Letters Patent No. 94,849, dated September 14, 1869.

IMPROVEMENT IN PORCELAIN-KNOB MACHINES.

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, THOMAS J. SLOAN, of New York city, of New York county, in the State of New York, have invented certain new and useful "Improvements in Moulding Porcelain Knobs, &c.;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

Previous to my invention, it has been customary in the manufacture of porcelain door-knobs, to mould them (one at a time) by means of a stationary mould, or die, having a movable bottom and a reciprocatory die, or plunger, working in the former, in a manner well known to those engaged in the manufacture. With this generally-practised system and machinery, the operation of moulding knobs is necessarily slow, and, consequently, expensive, the only means of increasing the capacity to manufacture being an increase in the number of machines employed and the manual labor attendant upon each machine.

My invention has for its main object to afford an organized machine, by means of which the process of moulding knobs and other analogous articles may be accomplished with great expedition, and by means of which, while it is simple and durable, the process of moulding the knobs rapidly may be conducted without much manual labor; and to these ends,

My invention consists in the employment, in combination with a suitable hopper, or feeder for supplying the material and suitable upper and lower movable dies for compressing the material into shape, of a rotary disk, formed with a series of openings through it, of a shape corresponding to the contour of the knob or other article to be moulded, and arranged to turn immediately over a plate, or platform, which serves to retain the material fed into the openings until it shall have been packed tight in said openings, ready to be operated upon by the dies, all as will be hereinafter more fully explained; and

My invention further consists in the employment, in combination with a perforated moulding-disk, of a single die, to form one side of the knob, and a double or compound die, to make the cavity in (for the shank) and shape the other side of the knob, the whole operating together in substantially the manner hereinafter set forth; and

My invention further consists in the employment, in combination with the feeder, the perforated moulding-disk, the bottom-plate, and plunger for packing the material, and the dies for compressing and forming the article, of a reciprocating ejector and receiving-apron, or carrier, all arranged and operating as hereinafter more fully explained; and

My invention further consists in the employment, in combination with the moulding, or compressing-

dies, of cleaning and lubricating-brushes, which are arranged to operate in such a manner, that while they effectually clean the faces of the dies and grease them, they leave no surplus oil on the dies; and

My invention further consists in so arranging the parts of the moulding, or compressing-mechanism as will be hereinafter more fully explained, that while a sufficient pressure may be exerted, the fulcrum of motion or pressure-attachment will yield, in the event of undue pressure arising from an over charge in the moulds, or other obstruction to the dies, and thus prevent breakage or a derangement of the parts of the machine.

To enable those skilled in the art to make and use a machine embodying my invention, I will proceed to describe the construction and operation of one, referring by letters to the accompanying drawings, in which—

Figure 1 is a side elevation.

Figure 2, a back view.

Figure 3, a side view.

Figure 4, a vertical section, at line *x x*, fig. 2.

Figure 5, a horizontal section, at line *y y*, fig. 4.

Figure 6, a detail skeleton view of the cam and star-wheel, by means of which the moulding-disk is moved.

Figures 7, 8, 9, and 10, skeleton views of one of the cleaning and lubricating-brushes and its actuating-mechanism.

In the several figures the same part is designated by the same letter of reference.

A is the base of the machine, from which projects upward a yoke-shaped frame, B, in which are hung the main driving and other shafts.

The main shaft C has the motive-power applied to it in the usual manner, and is intended to have a continuous and uniform rotary motion. It is connected, by means of spur-gears D E, with the shaft F, imparting to the latter an opposite rotary motion, and it is provided with cams G, H, and I, keyed fast to it.

The shaft F is provided with a spool-shaped groove-cam, J, which so operates upon the star-wheel I² as to impart to it an intermittent rotary motion, holding it in a locked condition between each movement, and said shaft is also provided with a small face-cam, K, which operates the brush-shaft in a manner to be presently explained.

L is a rock-shaft, arranged between the two shafts just above referred to. It is provided with an arm, M, which turns with it, and which is operated upon by the cam H, and has arranged on it, so as to turn freely, another arm, or lever N, which is operated on by the cam I. The bearing-point of lever N is kept up to its cam I by means of a spring, O, connected to one end of said lever and to the base A of the machine, while the bearing-end of arm M is held in con-

tact with its cam H by means of the spring P, pressing upward against arm Q.

From one side of frame B projects an arm, R, in which are formed the bearings for the compound-die piston S and the vertical shaft T, which carries at its upper end the moulding, or knob-disk U, and at its lower end the star-wheel I².

On the shaft T is hung, so as to have some play vertically, a frame, V, which carries, fast to its upper end, a plate, W, which constitutes a false bottom to some of the holes, or perforations of disk U, and which is held up against the bottom of disk U with a spring pressure by the spring x. The object and advantage of thus arranging the plate W is that it may yield, in the event of particles of the material lodging between it and disk U, which latter is so formed on its bottom as to tend to push out at the circumference any such confined particles.

The compound die just referred to is composed (see fig. 4) of the outer portion S, which is moved up and down by the vibratory motions of lever N, and the inner portion a, which is independently moved by the arm b of rock-shaft L, connected to it by a link, c.

The arrangement of the parts of this compound die, or former, and the mechanism operating them, is such that the two parts of the die ascend together until the material is reached. The inner die a then ascends alone, until its teat d forms the cavity for the shank of the knob and its shoulder supports the outer portion at 4 4, (see fig. 4.)

In the stands e f, or portions of the frame, are formed the bearings of the vertical shaft g, which carries with it (hung to projecting arms) two auxiliary rods, h and i. One of these, h, is so arranged as to yield with a spring, j, when its lower end is pressed upward, and constitutes the presser, being provided at its lower end with a foot corresponding in contour to the perforations in disk. The other arm i is rigidly connected with the shaft g, and constitutes the extractor for discharging or pushing out of the perforations of the said disk the moulded article, which is received on an endless apron, K, by which it is conveyed away to be finished.

The die-shaft g is moved up and down by one end of a vibratory arm, m, to which it is hung, and which is pivoted at n to the hanger o. The other end of said arm m is operated upon, through the medium of link p, by the cam G being kept in contact with, or held downward against the cam-surface, by means of a bifurcated arm, q, pivoted in the cross-bar r of the main frame, and actuated by the spiral spring s³.

The hanger o is not rigidly attached to the upper part of the machine, but passes through a bearing, in which it is free to move vertically upward, and is held down in its seat by link t in a lever u. This lever is held down at its rear end, or long arm, by a strong spring, v. The object and advantage of this arrangement is, that the whole system may be yielding, so that in the event of the material "claming," so that an over-charge gets in between the dies, the upper one may yield, and a breakage of any parts be avoided.

A² is the hopper, from which the material, properly mixed and tempered, is continually fed into the receptacles 1 2 3, &c., of the disk U. The filling of these receptacles from said hopper is insured or induced by an agitator, B², which is pivoted at C², and vibrated on its pivot by means of its arm being coupled to the vertically-reciprocating rod i, by means of a stud, or pin, d².

The carrier-apron k passes over pulleys, or spools 6 7 8, and is moved by the face of shaft O. Near the circumference of disk U stands a vertical shaft, f², which is arranged to turn freely in its bearings, and is oscillated by the conjoint action of a spring, g², pulling around in one direction, and a rod, h², attached to an arm, i², and lever k², resting against the

cam k, pulling it around in the opposite direction, in such a manner as to periodically throw or swing the arms n² opposite to and away from the faces of the dies, and on the ends of these arms n² are arranged swivelling, or turning circular disks o², provided with greased sponges, or wipers p², which are held and rotated against the faces of the dies, while they are at rest before each stroke made by them.

These wiper-disks are rotated in the following manner:

Near the periphery of each is pivoted one end of a bar, s², the other end of which is pivoted to an arm, t², of the sleeve u², on shaft f², and to this last-named end of s² is also attached one end of a spiral spring, w², the other end being secured to arm n². On the sleeve u² is a protecting teat, or short rib, a⁴, which is struck by tappets b⁴, projecting from the periphery of disk. (See figs. 7 and 8.)

From this arrangement of parts, it will be seen that at the proper times, during the motions of the disk U, the sleeve u² will be turned on the shaft f², in one direction, a short distance, or part of a revolution on its axis, and then, being released, will be turned back again by the action of the springs w², thus effecting a double rotatory motion in the die-wiper and lubricator. This method of and device for wiping the dies is a most desirable one, because the die is effectually wiped out without having any surplus oil deposited on its face, which would tend to render the machine less efficient in its operation, by inducing the material to drag or stick to the die.

From what has been said of the construction of the machine and the arrangement and operation of the several parts, the following brief explanation of the general operation will suffice:

The hopper being supplied, and the machine put in running order, power is applied to the main driving-shaft, when the material will be automatically fed or filled into the cavities 1 2 3, &c., of the disk U, as it rotates, with an intermittent rotatory motion, as the charged perforations, or holes come around in succession under the presser h, the plate W serving as a bottom to said perforations and support for the contained material, said presser descends, and packs the clay in the perforations, so that no bottom-plate is necessary to insure its retention therein. The packed charge, passing on at the next partial rotation of the disk, comes in line with dies g and S, when the latter ascends, as before described, and the former then descends, and the article is compressed and moulded between the upper and compound lower dies, and passes around in the disk still, and is forced out or discharged on to the apron k by the extractor i. As soon as the dies g and S have receded from each other, the wipers p² are swung around in close proximity to their faces. The dies are then moved close to the sponges, or wiping-surfaces, and the latter then quickly turned, as already explained, to clean and lubricate the said die-faces.

It will be understood, by means of an organized machine embodying the mode of operation set forth, the material supplied by the hopper is very rapidly worked up, and perfectly moulded, discharged, and carried off, and that with such a machine nearly all hand-labor is dispensed with, it merely being necessary for attendants to supply the machine with material and receive the finished knobs.

Of course the openings in the disk, though represented as of circular, for the formation of round knobs, may be made of any desired contour, to correspond with the contour of the article to be moulded, and the faces of the dies may be made of any desired shape and design.

Many of the details of construction may be varied from those shown and described without changing the character of the machine and the mode of operation.

Having explained the several features of my new machine, and its construction and operation, so that those skilled in the art can understand and use it,

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

1. The employment, in combination with a feeder, or hopper, *A*², for supplying the material, a perforated rotary disk, *U*, for receiving the charges, and a stationary bottom-plate, *W*, and packing-plunger *z*, of suitable dies *G* and *S a d*, for compressing the material into shape within the perforated disk, the whole constructed to operate substantially as hereinbefore set forth.

2. The employment, in combination with a die and perforated holder, or disk, of another compound die, adapted to form the shank-cavity and back side of the knob, substantially as herein set forth.

3. The combination, with the feeder *A*², moulding-disk *U*, and dies *G* and *S a d*, and packing-plate *W*,

and plunger *z*, of an ejector, *i*, and receiving-apron, the whole arranged to operate as specified, for the purpose set forth.

4. The employment, in combination with the face of a die, of a cleaning and lubricating-brush, or its equivalent, which is arranged to revolve against the face of the die in the manner described.

5. Hanging either of the dies, or die-frames, on a yielding fulcrum, substantially as described, so that in the event of an over-charge from "claming," or other obstruction to the movements of the die, any breakage or over-straining of the machine or its parts will be avoided, as set forth.

In testimony whereof, I have hereunto set my hand and seal, this 19th day of July, 1869.

THOS. J. SLOAN. [L. S.]

Witnesses:

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