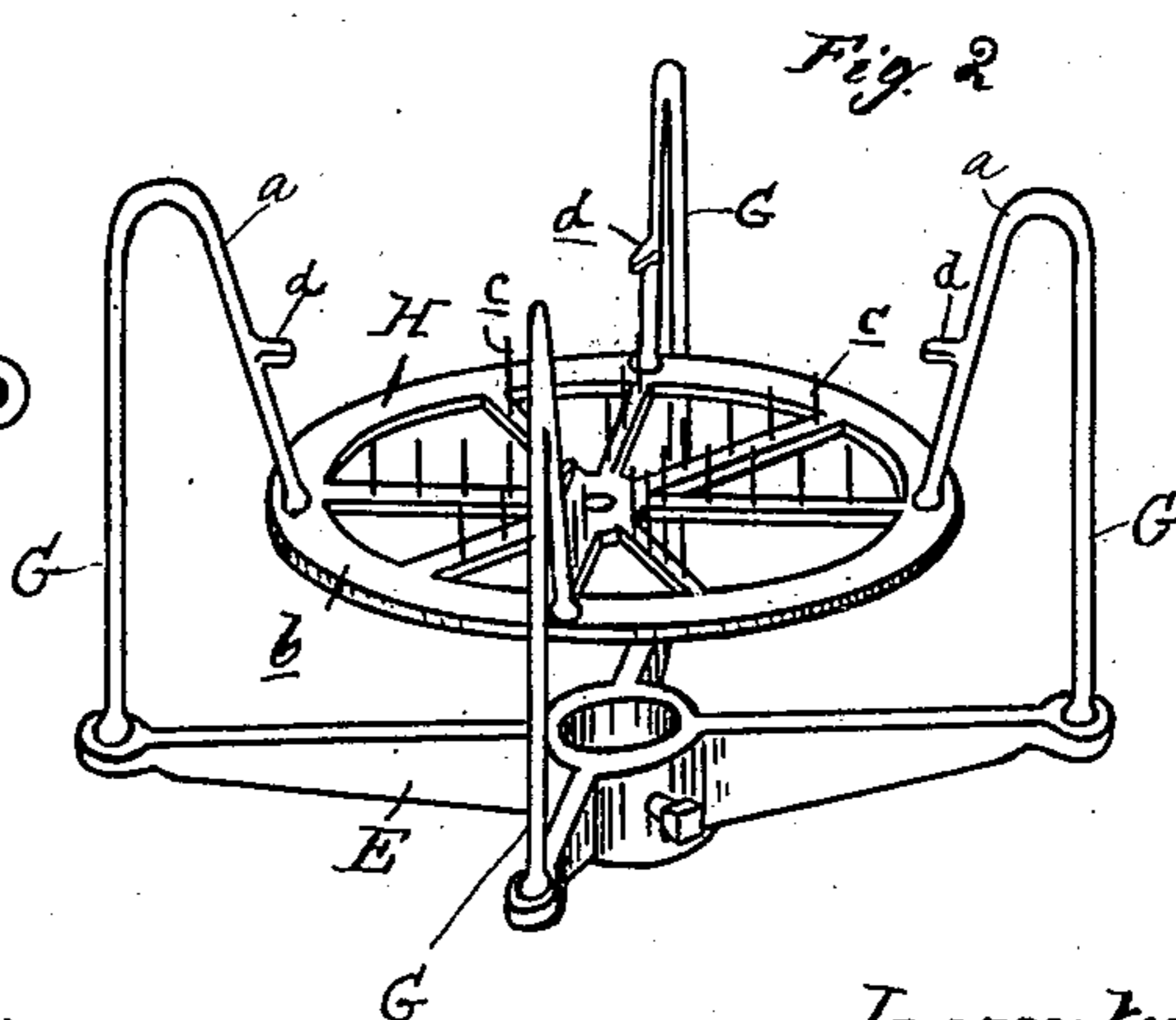
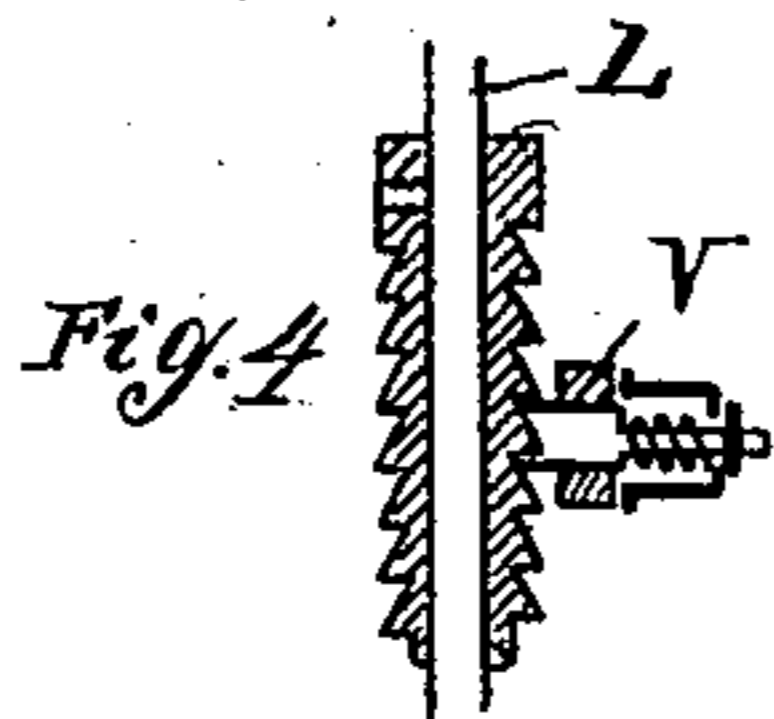
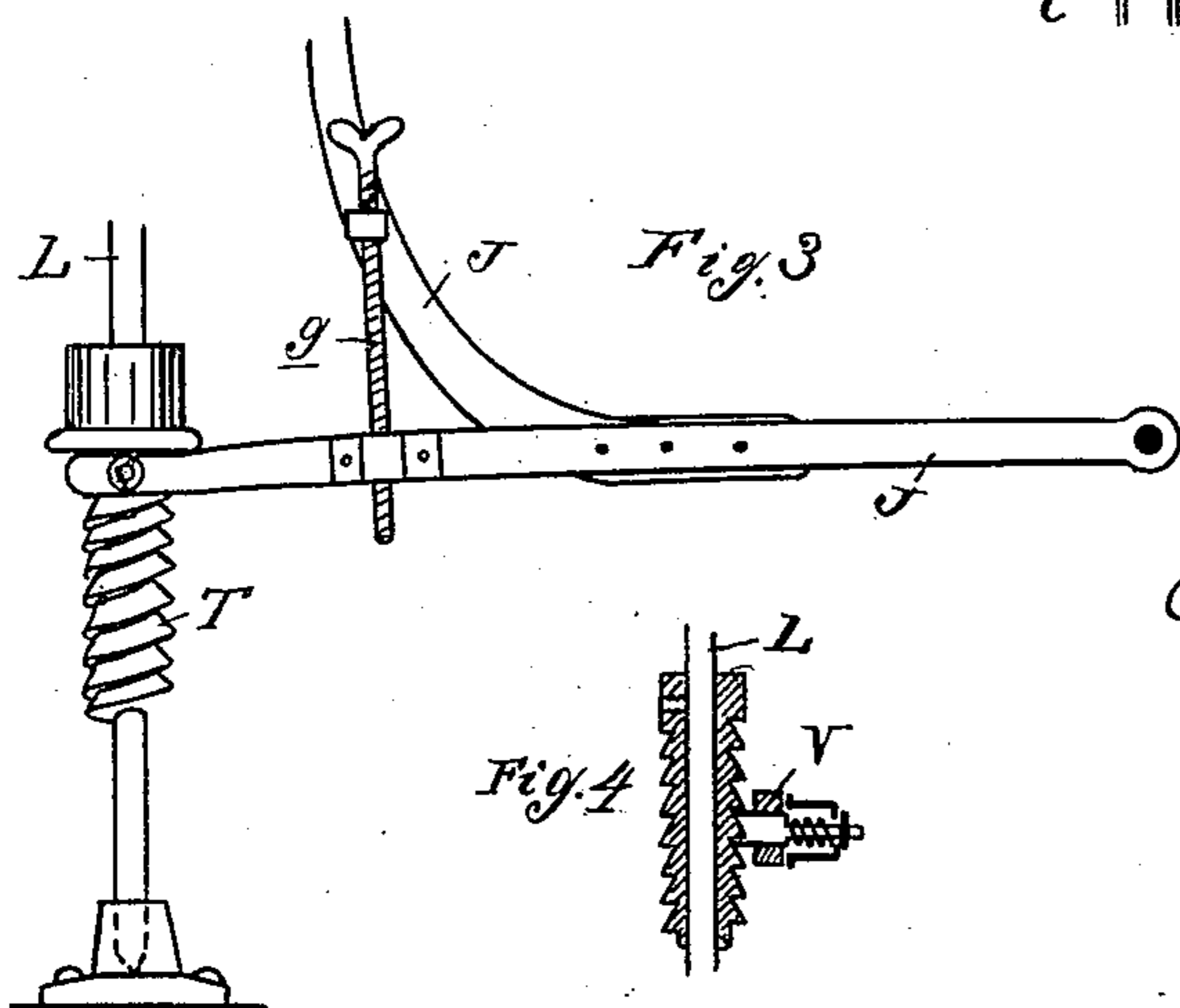
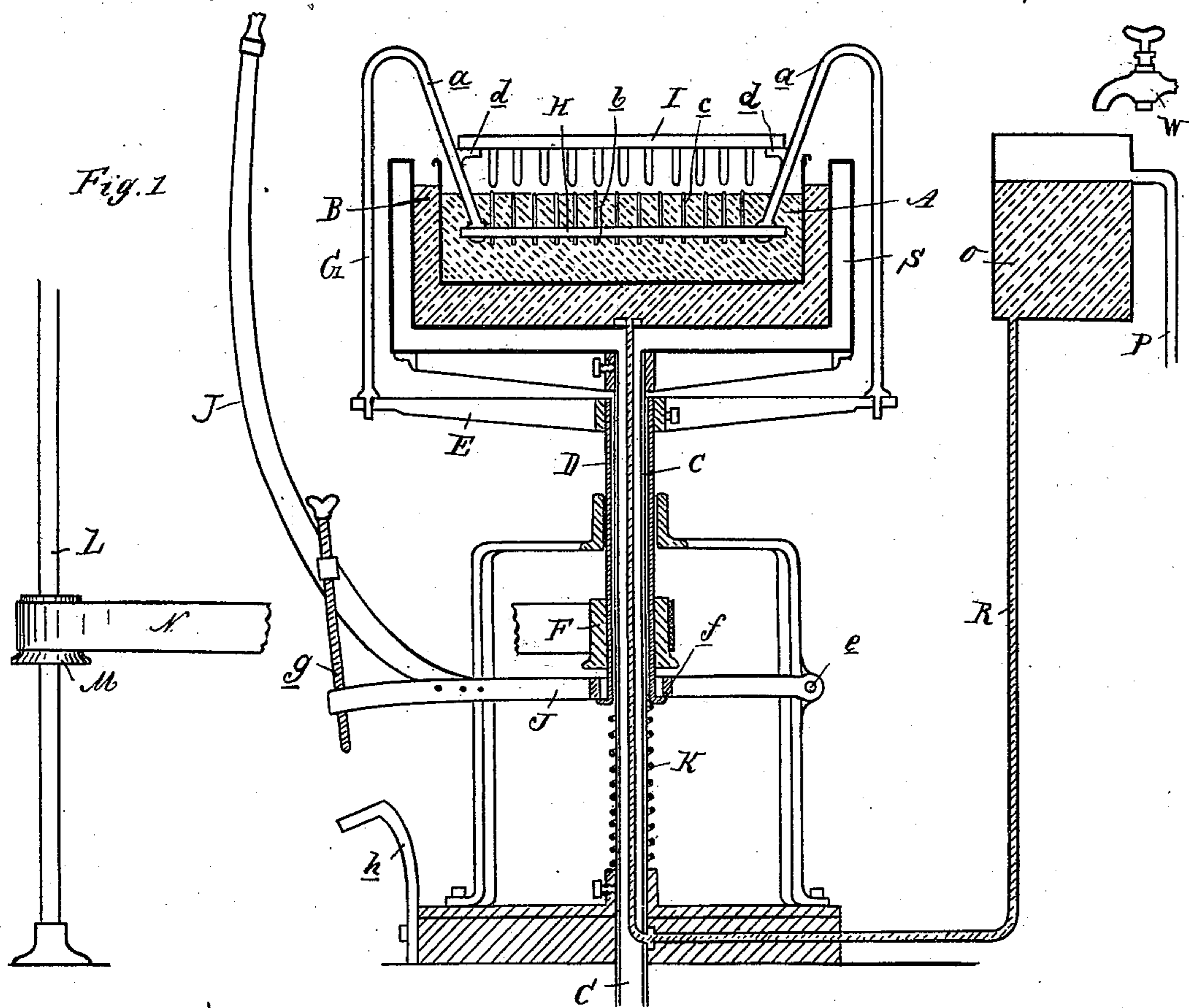


(No Model.)

J. KREHBIEL.
CAPSULE MACHINE.

No. 334,240.

Patented Jan. 12, 1886.



Attest:
John Schuman.
Charles J. Neuh.

Inventor:
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by his Atty
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UNITED STATES PATENT OFFICE.

JOHN KREHBIEL, OF DETROIT, MICHIGAN, ASSIGNOR TO THE GLOBE DRUG AND CAPSULE COMPANY, OF SAME PLACE.

CAPSULE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 334,240, dated January 12, 1886.

Application filed May 13, 1885. Serial No. 165,354. (No model.)

To all whom it may concern:

Be it known that I, JOHN KREHBIEL, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Capsule-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in the construction and operation of devices employed in the dipping of capsule-molds; and it is intended to form an improvement upon a device described in Letters Patent issued to me on the 15th day of April, 1884, and numbered 296,848.

The invention consists in the peculiar construction, combination, and arrangement of the different parts, whereby the operation of the device is improved and rendered more automatic, all as more fully hereinafter described.

Figure 1 is a vertical central section of my improved device for the purpose described. Fig. 2 is a detached perspective view of the stirring portion of the device. Figs. 3 and 4 are details, which are specifically referred to hereinafter.

In the accompanying drawings, A is the vessel in which the gelatine employed is contained, and B is a hot-water bath in which the vessel A is floated.

C is a hollow standard, supporting the hot-water bath.

D is a hollow shaft sleeved upon the standard C.

E is a spider secured near the upper end of the hollow shaft B, and F is a small pulley secured near the lower end of the hollow shaft D.

H is a stirrer consisting of the spider-shaped base-plate *b*, which is provided with a number of pins, *c*. This stirrer is submerged in the gelatine solution, with the heads of the pins just emerging from its surface, by means of the standards G, to the overhanging ends *a* of which it is secured. The standards G are removably supported upon the outer ends of the spider E, and their overhanging ends are provided with lugs *d*, which project hori-

zontally and inwardly and serve as supports for the mold-plate I in dipping.

J is a hand-lever pivotally secured at *e* and embracing at *f* the lower end of the hollow shaft. It is also provided with an adjustable stop, *g*, which, when the lever is depressed, impinges against a stationary stop, *h*.

K is a coil-spring placed around the foot of the standard C, and exerts its tension to uphold the hollow shaft C and lever J in the normal position, as shown in Fig. 1.

L is a counter-shaft provided with a pulley, M, and by means of a belt, N, motion is transmitted from this counter-shaft to the hollow shaft D.

O is a vessel provided with an overflow-pipe, P, and a communicating-pipe, R, by means of which a communicating water-level is maintained between the hot-water bath and the water in the vessel O, and in order to keep this level at a permanent height a small stream of water is allowed to flow into the vessel O from a suitable source of supply. The communicating-pipe R is led to the hot-water bath through the hollow standard C, and the proper temperature of the hot-water bath is either maintained by means of steam passed through the hollow standard C into a steam-jacket, S, surrounding the hot-water bath, or by means of a gas or oil burner suitably arranged below the hot-water bath.

In practice the stirrer is kept constantly revolving, so as to prevent the gelatine from forming a skin on its surface, which would greatly interfere with the proper dipping of the mold-pins. As the pins *c* project slightly through the surface of the gelatine, they keep constantly renewing the surface by keeping up a circulation through the movement of the stirrer. This movement is toward the periphery on top and toward the center on the bottom, thus all the scum and bubbles which may form on the surface are quickly carried to the periphery of the vessel, where they are beyond the reach of the mold-pins in dipping, while the central part of the vessel is always supplied with fresh gelatine from the bottom. A further advantage of this stirrer is that it does not produce air-bubbles, as it is kept constantly submerged, whereas if it should

be temporarily withdrawn it would upon being reimmersed introduce a quantity of air into the gelatine, and thus form troublesome air-bubbles, which would break the continuity of the thin wall of the perfected capsules. By the employment of this stirrer, the consistency of the gelatine will be kept uniform in all parts of the vessel containing it—a desideratum of the utmost importance in securing capsules of uniform thickness.

As it is more convenient to arrest the movement of the stirrer while the mold-pins are being dipped into the gelatine, the belt N is so loose upon its pulleys that it will readily slip when the operator interferes with the face-travel of the parts.

To dip the mold-pins, the operator lays a mold-plate, with the pins projecting downward, upon the lugs *d*, as shown in Fig. 1. Then he depresses the lever J (which is provided either with a convenient hand or foot piece, as may be preferred) as far as its adjustment will allow, and then, releasing the pressure upon the lever, the coil-spring K will restore the parts to their original relative positions.

As the thickness of the film which adheres to the mold-pins depends upon the length of time they are allowed to remain immersed in the gelatine, I prefer, for the sake of securing the greatest uniformity in the thickness of the capsules, to provide the more inexperienced operator with a time-movement, such as shown in Figs. 3 and 4, in which the counter-shaft L is provided with a worm, T, and the lever J reaches into proximity to this worm, and has a spring-dog, V, which is adapted to engage with this worm. Now, as the operator depresses the lever J the dog V will slide over the worm until said lever is released, when the dog will engage with the worm and gradually restore the lever to its original position at a uniform interval of time at each dipping.

During the process of dipping the surface of the gelatine will always remain upon the same level, so that the mold-pins at each operation are always immersed to the same depth. The loss of gelatine from dipping cannot alter its level, as the buoyancy of the vessel A in which it is contained increases practically in the same ratio as the gelatine decreases in volume, (the vessel being constructed of a thin metal plate,) and the surface of the water in the bath will always keep upon the same level, owing to the action of the communicating vessel O, which quickly restores all loss of water resulting from evaporation or its changing level, owing to the changed buoyancy of the gelatine-vessel. If at any time the vessel A is replenished with gelatine, the proper level will be quickly restored, as the surplus water will then flow back into the vessel O and out through its overflow.

What I claim as my invention is—

1. In a device for the purposes described, a hot-water bath and a vessel containing the gelatine and floating in said bath, in combination with a water-reservoir having an overflow-pipe and a pipe leading therefrom to said bath, whereby a uniform water-level in said bath is maintained, substantially as set forth.

2. In a device for the purpose described, the combination, with a hot-water bath and a vessel containing gelatine floating in said bath, of a vertically moving and rotating frame having lugs for supporting the mold-plates, and mechanism for dipping said frame into the gelatine, as set forth.

3. In a device for the purpose described, and in combination with a rotating and vertically reciprocating dipping-frame, a stirrer consisting of a spider supported by said frame and having a series of pins projecting upwardly from its arms, substantially as and for the purpose specified.

4. In a device for the purpose described, the combination, with a revolving shaft and a spider carried thereby, of a vertically-movable dipping-frame removably secured to and supported by said spider, substantially as specified.

5. In a device for the purposes described, the combination, with a hot-water bath and a vessel containing gelatine floating in said bath, of a revolving shaft, a spider, E, carried thereby, and a vertically-reciprocating frame supported by said spider and carrying a stirrer, and lugs for supporting a mold-plate, and mechanism for dipping said frame into the gelatine, substantially as described.

6. In a device for the purpose described, the combination of a hot-water bath, a vessel containing gelatine floating in said bath, a hollow standard supporting said bath, a water-reservoir having a water-supply and an overflow, and a communicating pipe passing through said hollow standard, the parts being constructed, arranged, and operating substantially as and for the purposes set forth.

7. In a device for the purpose described, the combination of the following elements: a hot-water bath, a gelatine-containing vessel floating in said bath, a water-reservoir having a water-supply and an overflow-passage, a communication between said reservoir and bath, and a stirrer rotating within said gelatine-containing vessel, the parts being constructed, arranged, and operating substantially as specified, and for the purposes set forth and shown.

JOHN KREHBIEL.

Witnesses:

H. S. SPRAGUE,
CHARLES J. HUNT.