

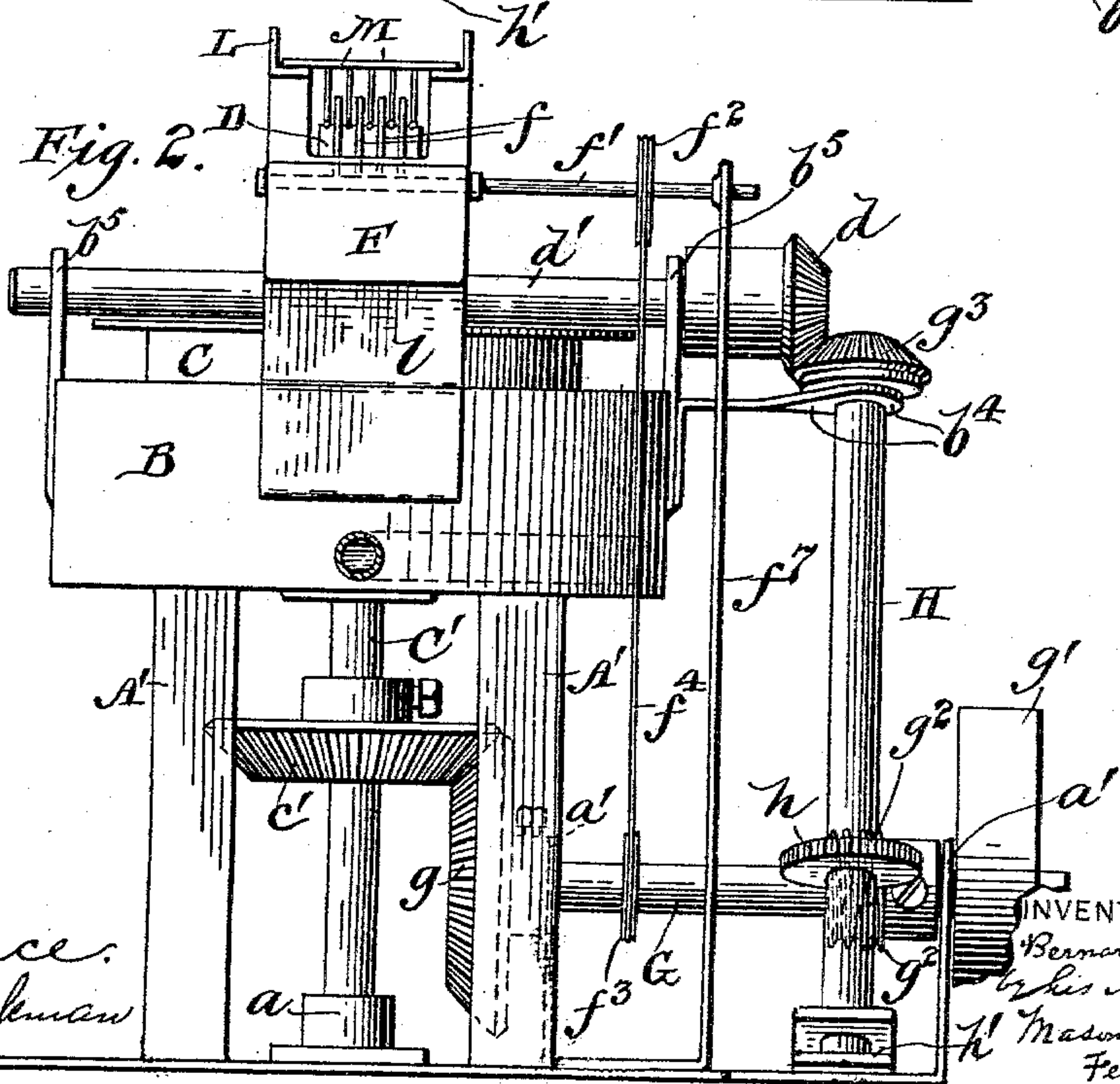
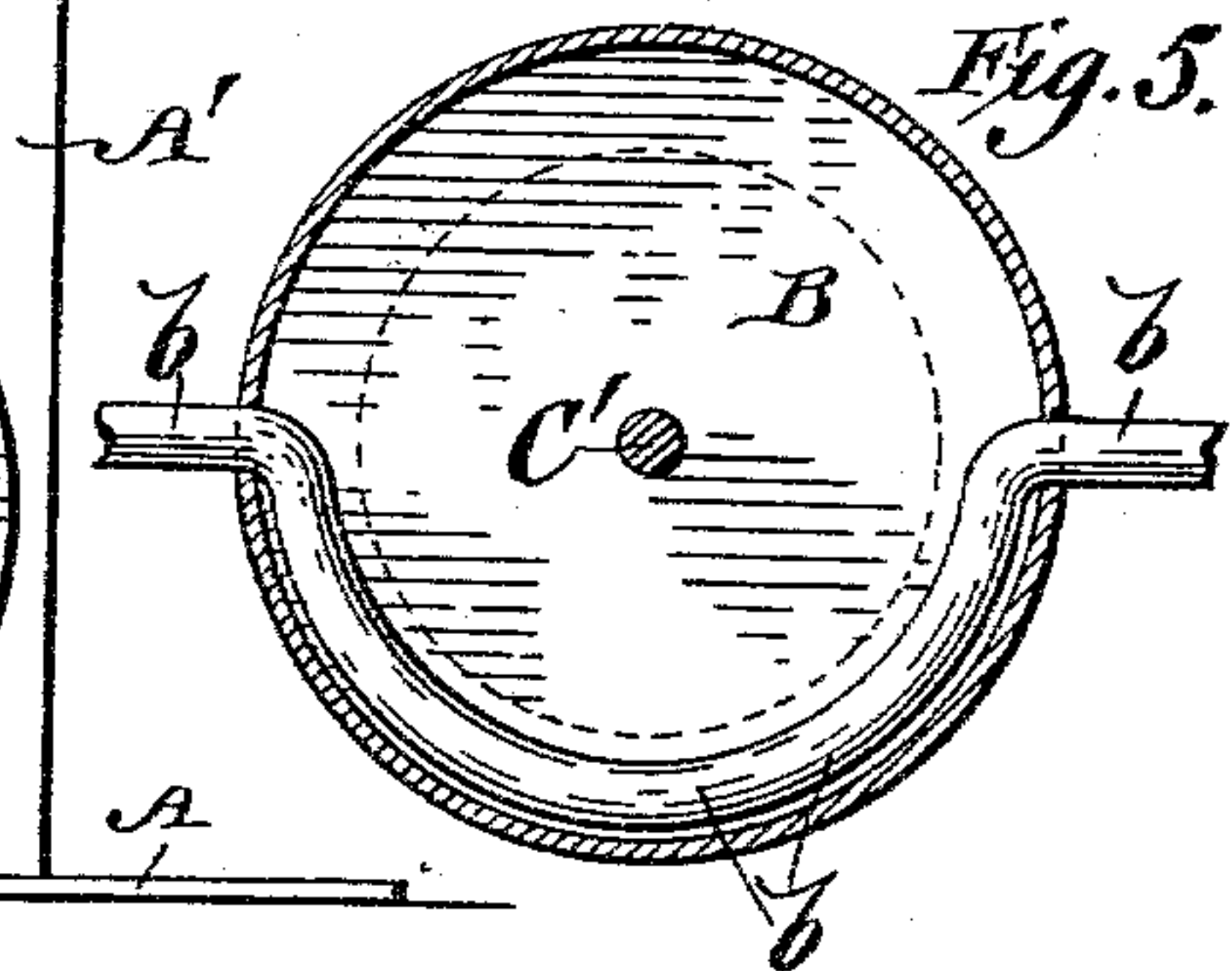
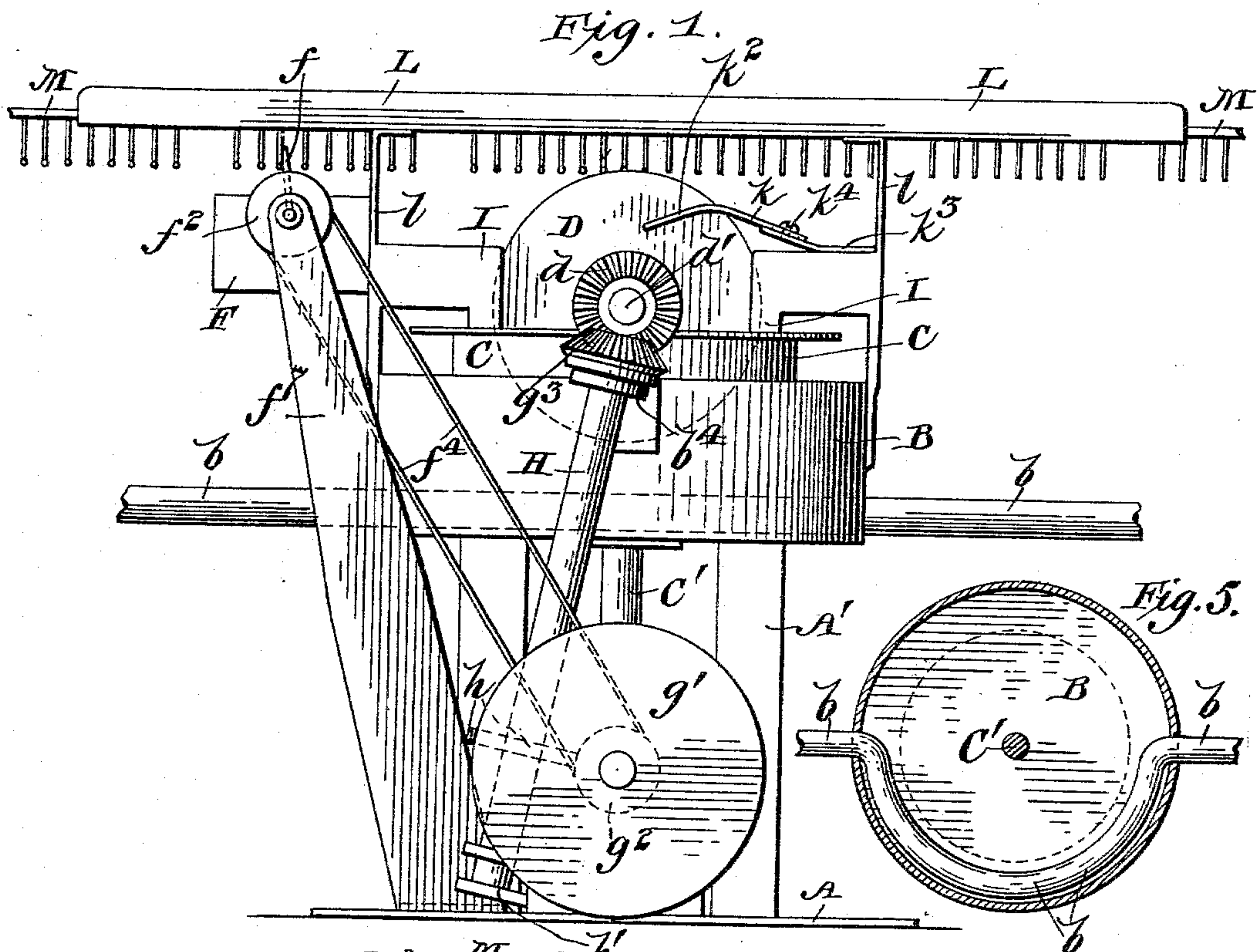
(No Model.)

2 Sheets—Sheet 1.

B. T. STEBER.
MATCH MACHINE.

No. 559,759.

Patented May 5, 1896.



WITNESSES

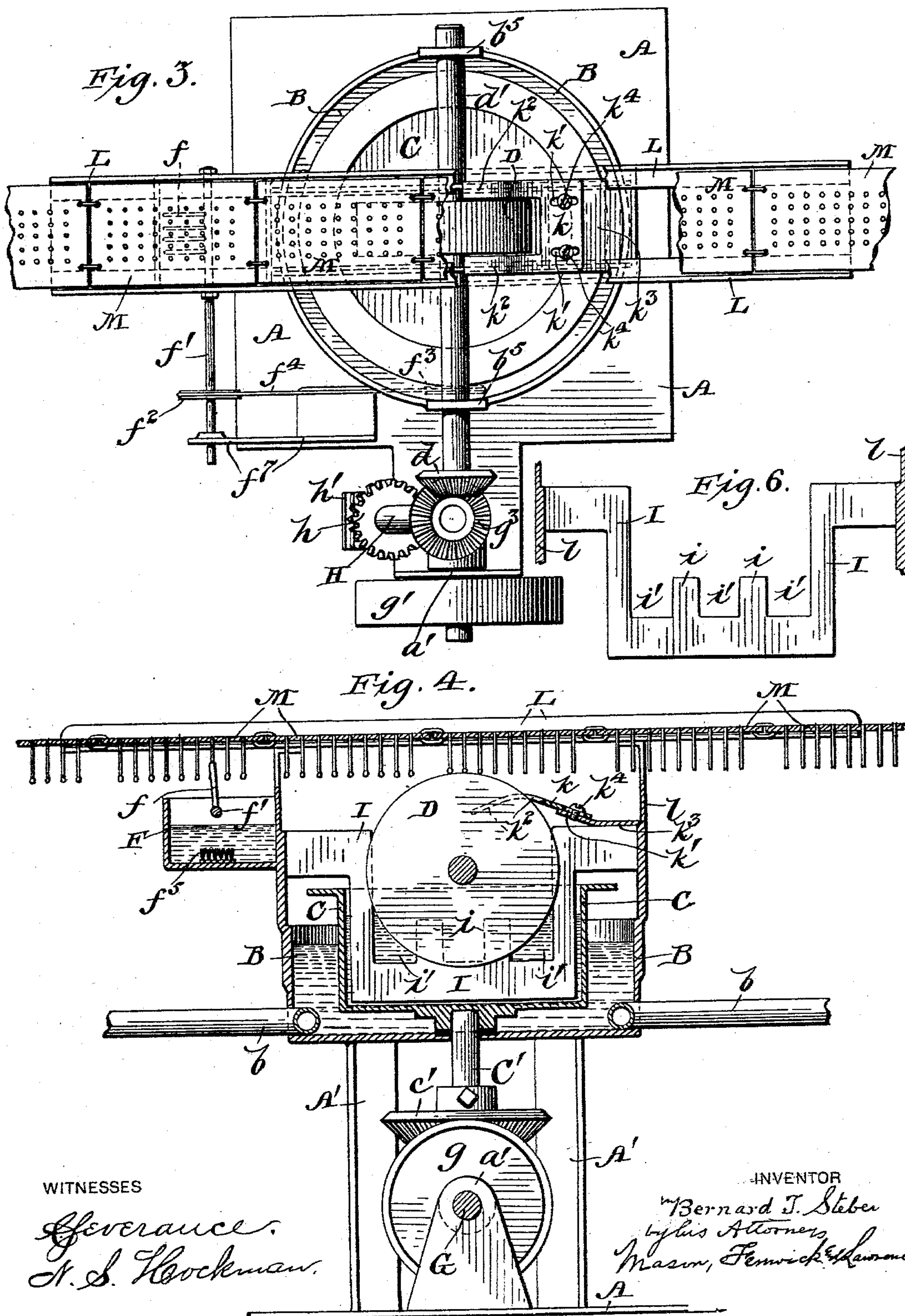
Deverance.
H. S. Hockman

INVENTOR
Bernard T. Steber
his Attorneys
H. Mason
Fennick and
Lawrence

2. Sheets—Sheet 2.

No. 559,759.

Patented May 5, 1896.



UNITED STATES PATENT OFFICE.

BERNARD T. STEBER, OF UTICA, NEW YORK.

MATCH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 559,759, dated May 5, 1896.

Application filed December 23, 1895. Serial No. 573,092. (No model.)

To all whom it may concern:

Be it known that I, BERNARD T. STEBER, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Match-Machines; and I 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.

My invention relates to improvements in match-machines, and has more particular relation to such machines as are specially designed for the "heading" of the so-called "parlor matches."

The invention consists of the combination, with a suitable frame, of a composition-vat rotatably mounted upon the same, stationary agitating-blades projecting into said vat, a distributing-roller mounted independently of the vat in a fixed support or bearing and extending into the vat, devices for bringing the match-splints into contact with said roller, and means for operating said vat, roller, and splint-carrying devices.

It also consists of the combination, with a suitable frame, of a stationary heating-tank mounted upon the same, a composition-vat rotatably mounted within the same, a distributing-roller mounted independently of the vat and extending into the same, devices for bringing the match-splints into contact with said roller, and means for operating said vat, roller, and splint-carrying devices.

It also consists of certain other novel constructions, combinations, and arrangements of parts, all of which will be hereinafter more particularly set forth and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 represents a side elevation of a machine embodying my invention. Fig. 2 represents an end elevation of the same. Fig. 3 represents a top plan view of said machine. Fig. 4 represents a central vertical longitudinal section through said machine. Fig. 5 represents a top detail plan view of the steam-pipe for the heating-tank, and Fig. 6 represents a detail side elevation of one of the agitating-blades for the composition-vat.

A in the drawings represents the base; A',

the frame erected upon the same; B, the heating-tank; C, the composition-vat; D, the distributing-roller; E E, the agitating-blades, and F the comb-containing receptacle.

The frame A' is of any suitable material and construction whereby the heating water-tank B may be firmly supported in position. This tank is preferably circular in shape, is open at the top, and provided with a heating steam-pipe *b*. This pipe enters the tank at one side and passes in proximity to the side wall to a diametrically opposite point, where it again passes through the side wall and out of the tank. This pipe, by hugging closely to the side wall in its passage through the tank, leaves the central portion of the tank unobstructed to receive the rotatable composition-vat C. This vat is also preferably circular and of less diameter than the tank B, and is mounted within the latter and carried by a vertical shaft C', that passes through a suitable water-tight washer in the bottom of the said tank B. The lower end of this shaft is journaled in a step *a*, mounted on the base. A bevel gear-wheel *c'* is mounted on said shaft and meshes with a similar bevel gear-wheel *g*, mounted on the inner end of the power-shaft G, said shaft being journaled in suitable bearing-boxes *a' a'*, mounted on the base. A belt-wheel *g'* is mounted on the outer end of the shaft and is connected to any suitable source of power, whereby the shaft G and mechanism connected thereto are operated. A worm-gear *g²* is also mounted on said shaft and meshes with a gear-wheel *h*, mounted upon an oblique upwardly-extending shaft H. This shaft is mounted in a step *h'*, secured to the base A, and is supported in its oblique position by a bracket *b⁴*, mounted on the tank B. A bevel spur-wheel *g³* is rigidly mounted on the upper end of the said shaft H and meshes with a similar spur-gear *d*, mounted on a horizontal shaft *d'*, the latter being journaled in bearing-boxes *b⁵ b⁵*, mounted on the tank B. The composition-distributing roller D is rigidly mounted on the horizontal shaft *d'*, so as to extend down into the composition-vat C to a point very near the bottom of the same. Stationary agitating-blades I extend down into the vat on each side of the roller and are provided with suitable agitating pro-

jections *i i* and apertures *i' i'*. When the vat is revolved as before described, its contents come in contact with said agitators and circulate around them, and the composition comprising said contents is thus thoroughly commingled and the ingredients of different specific gravity prevented from separating into stratas. The composition sticks to the roller D as the latter revolves, and any excess of the same is scraped from said roller by an adjustable scraper *k*. This scraper comprises a plate having longitudinal slots *k'* and extension-arms *k*². The scraper is adjustably mounted on a plate *k*³, secured to the tops of the agitators by screws *k*⁴, which pass through said longitudinal slots, and when so mounted the arms *k*² extend forward and engage each side of the roller, and thus scrape all composition that may be clinging to the sides of the roller back into the vat. The carrier-guides L are constructed of angle-iron and are mounted above the roller D by supports *l l*, mounted on the tank B. The perforated plates M of the endless splint-carrier slide over the inwardly-projecting horizontal portions of the angle-iron guides, so that the lower ends of the splints, pendent from said plates, wipe the explosive composition from the periphery of the roller D, to which it is clinging. The speed of the endless carrier and the roller is approximately the same, so that a fresh supply of composition is brought into position to be caught by the splints as each successive row of splints is brought forward by the movement of said endless carrier. It very often happens that the composition, which is thick and very sticky, connects two or more of the pendent splints after they leave the roller, thus destroying the utility of said splints, as they must be cut or torn apart after drying, with the danger of exploding in so doing. To correct this defect, I provide a comb *f*. This comb is mounted on a rotatable shaft *f'*, that is journaled in the walls of the receptacle F, said receptacle being mounted on one of the carrier-guide supports. The shaft *f'* is provided with a belt-wheel *f*², that is connected to a belt-wheel *f*³ on the power-shaft by a belt *f*⁴. The extreme outer end of the shaft *f'* is mounted in a support *f*⁷, attached to base A.

A suitable brush *f*⁵ is mounted in an inverted position in the bottom of the receptacle F, so that as the comb *f* revolves its teeth will pass through the bristles of said brush and be cleaned, a suitable amount of water or other liquid being placed in the receptacle to assist in said cleaning of the comb. The operating connections of the comb are so arranged that it makes a revolution between each set of splints in the perforated plates as said splints reach a position over the same, and the teeth of said comb cut or wipe away the soft material that may be connecting the heads of the several splints.

The upper periphery of the vat C may be provided with a horizontal flange, if so desired.

The preferable composition for use in the vat C consists of chlorate of potash and phosphorus. This, as is well known, is violently explosive unless combined with a filler for separating the fine explosive particles. The preferred filler is ground glass or whiting, or a suitable combination of the two. The above ingredients are suspended in glue or other adhesive substance in the vat by agitation. It is very desirable to keep the composition in constant motion, as otherwise the several ingredients that compose the same will separate, as they are only a mechanical mixture and are of varying specific gravity. I fully provide for this constant agitation in my revolving vat with stationary agitators and roller between the latter.

It is absolutely necessary in the manufacture of matches that certain proportions of each ingredient be used, for if too much filler is used the match becomes slow or will not light at all, while if too little filler is used the match becomes explosive and dangerous. To maintain the exact proportion of parts throughout the whole thick mass in the vat, the constant agitation is not only necessary, but is essential.

By the use of the comb *f* I am enabled to place the splints very near together in the endless carrier, which is of course a great advantage, as more splints can be headed or tipped at a time. In practice the tank B is very nearly filled with water. This water is heated by the steam-pipe and in turn heats the revolving vat to a uniform temperature throughout and thus keeps the glue in a soft condition best suited for the work. The steam-pipe is connected to any suitable source of supply.

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

1. In a match-machine, the combination of a suitable frame, a composition-vat rotatably mounted upon the same, stationary agitating-blades projecting into said vat, a distributing-roller mounted independently of the vat on a fixed support or bearing and extending into the same, devices for bringing the match-splints into contact with the said roller, and means for operating said roller, vat and splint-carrying devices, substantially as described.

2. In a match-machine, the combination of a suitable frame, a stationary heating-tank mounted upon the same, a composition-vat rotatably mounted within the said tank a distributing-roller mounted independently of the vat on a fixed support or bearing and extending into the same, devices for bringing the match-splints into contact with said roller and means for operating said vat, roller and splint-carrying devices, substantially as described.

3. In a match-machine, the combination of a rotatable vat, splint-carrier above the vat, rotatory means for taking up and applying the composition to the heads of the splints, mounted on a fixed support or bearing and a

rotatable comb adapted to have its teeth move between the splints and cut the heads apart while still wet, substantially as described.

5 4. In a match-machine, the combination with a suitable frame, a water-tank mounted on the same, means for heating the water in said tank, a rotatable vat mounted in said tank, a distributing-roller mounted independ-
10 ently of the vat on a fixed support or bearing and extending into the same, devices for bringing the splints into contact with said roller, and means for operating said vat and roller, substantially as described.

15 5. In a match-machine, the combination with a suitable frame, a rotatable vat mounted on the same, agitating means in said vat, a distributor mounted on a fixed support or bearing for carrying the composition in said
20 vat to the match-splints, and means for operating said vat and distributor, substantially as described.

6. In a match-machine, the combination of a suitable frame, a hot-water tank, a rotat-
25 able vat, a distributing-roller mounted in a fixed support or bearing, a splint-carrier, a rotating comb having teeth arranged to pass between and separate the heads of the matches while still wet, and means for cleaning said
30 comb, substantially as described.

7. In a match-machine, the combination of a suitable frame, a splint-carrier, a hot-water tank, a rotatable vat, a distributing-roller mounted upon a fixed support or bearing be-
35 low the carrier, an adjustable scraper for varying the amount of composition fed to the splints, substantially as described.

8. In combination with a match-splint carrier and composition-distributor mounted on
40 a fixed support or bearing, of a rotatable comb provided with teeth which pass between the splints and cut their heads apart prior to

their delivery from the carrier, substantially as described.

9. In combination with a match-splint car- 45 rier, a composition-distributor mounted on a fixed support or bearing, and a rotatable comb having teeth, means for cleaning the teeth of the comb after they have passed be-
50 tween the heads of the splints, substantially as described.

10. In a match-machine, the combination of a rotatable agitator, stationary agitators, splint-carrier above the rotatable agitator, a revolving roller mounted on a fixed support 55 or bearing for taking up and applying the composition to the heads of the splints, substantially as described.

11. In a match-machine, the combination of a suitable frame, a composition-agitator 60 rotatably mounted upon the same, stationary agitating-blades projecting into the composition, a distributing-roller mounted on a fixed support or bearing independently of the said
65 rotatable agitator and extending into the composition, devices for bringing the match-splints into contact with said roller, and means for operating said roller, said rotatable agitator and splint-carrying devices, substan-
70 tially as described.

12. A match-machine comprising a tank, a rotatable vat arranged within the same, a dis-
tributing-roller mounted on a fixed bearing, and extending into the vat stationary agita-
75 tors or breakers arranged in the vat at suitable points relative to said distributing-roller, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

BERNARD T. STEBER.

Witnesses:

E. D. LEE,

BENJAMIN STEBER.