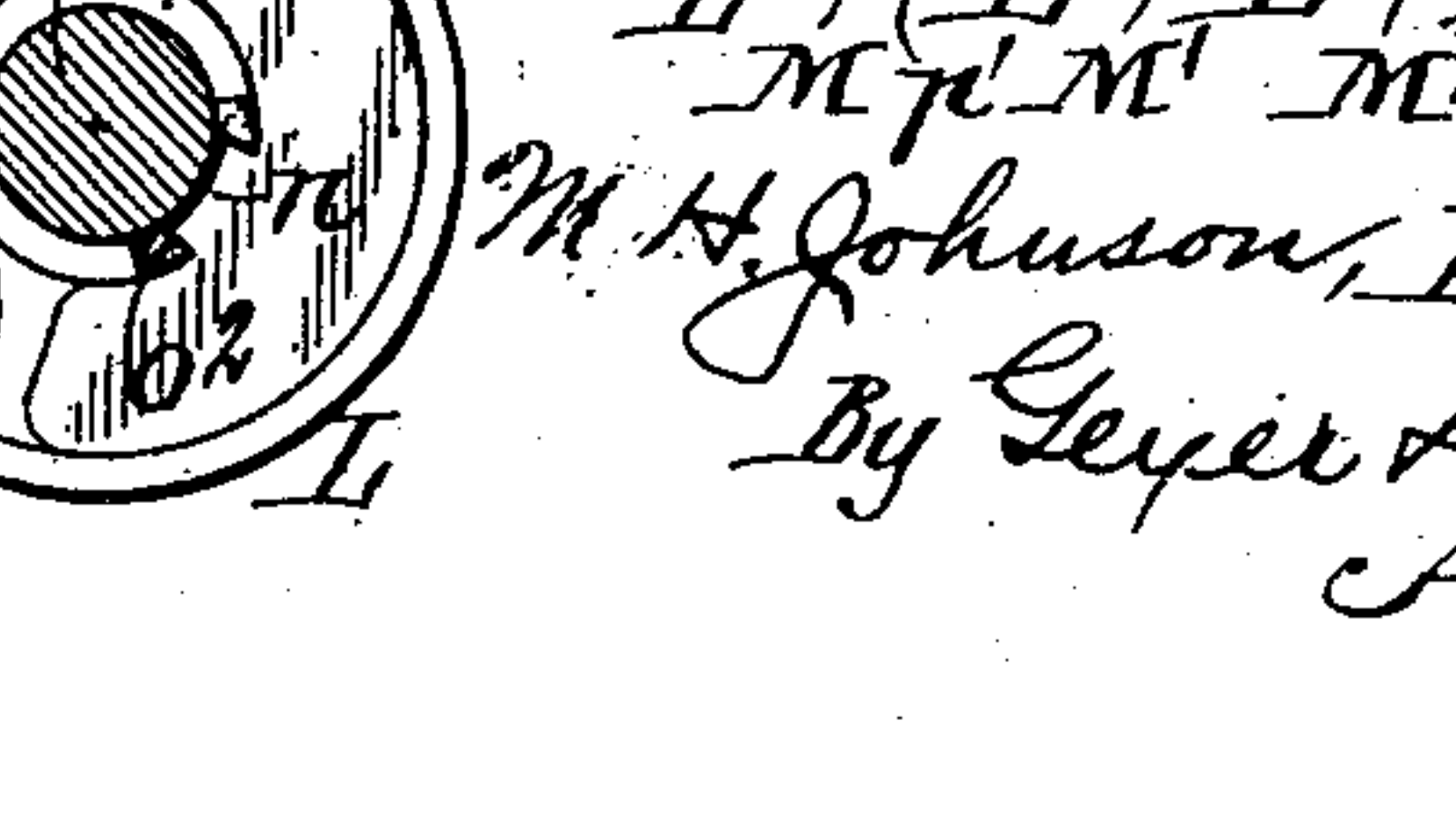
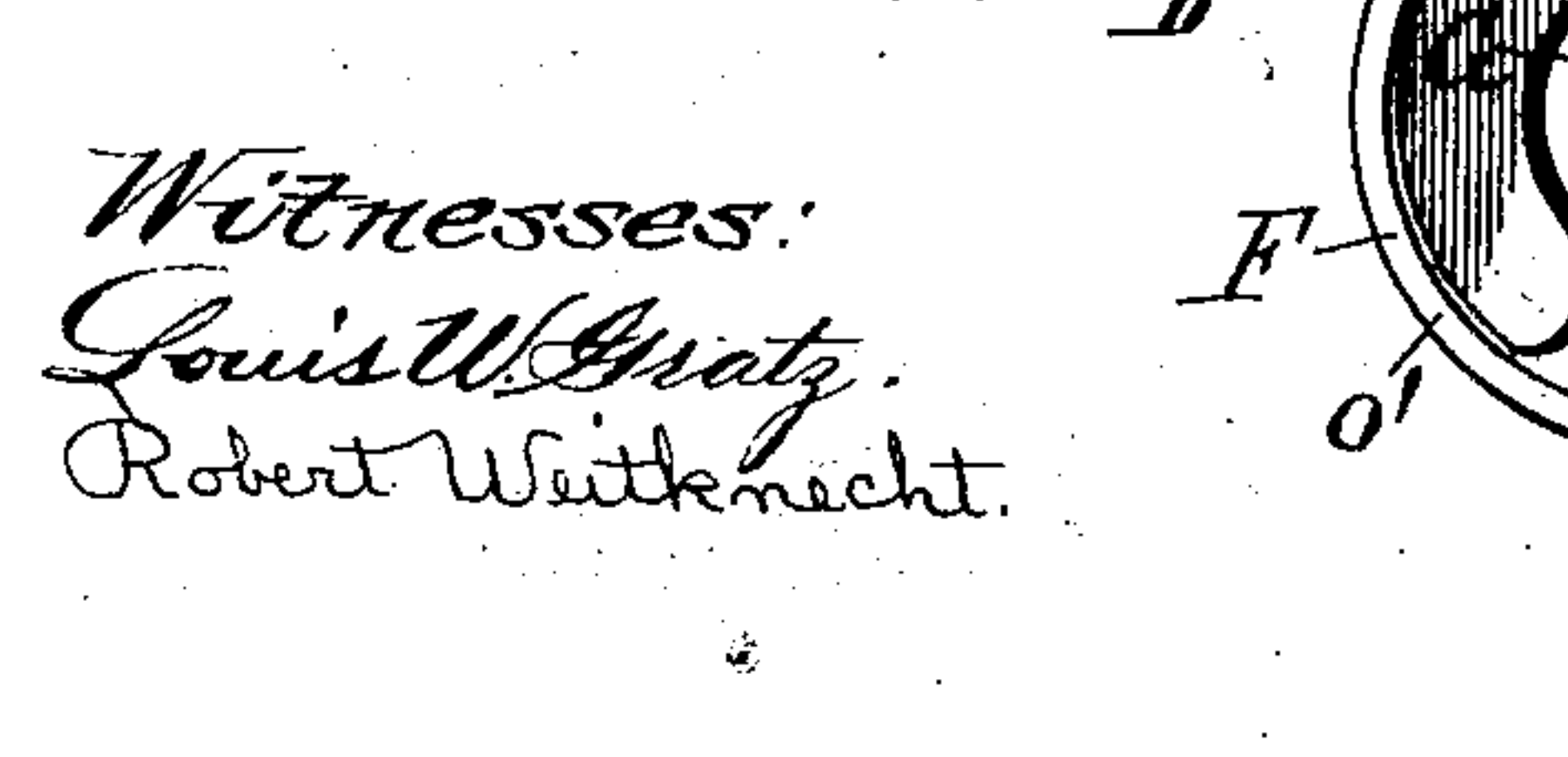
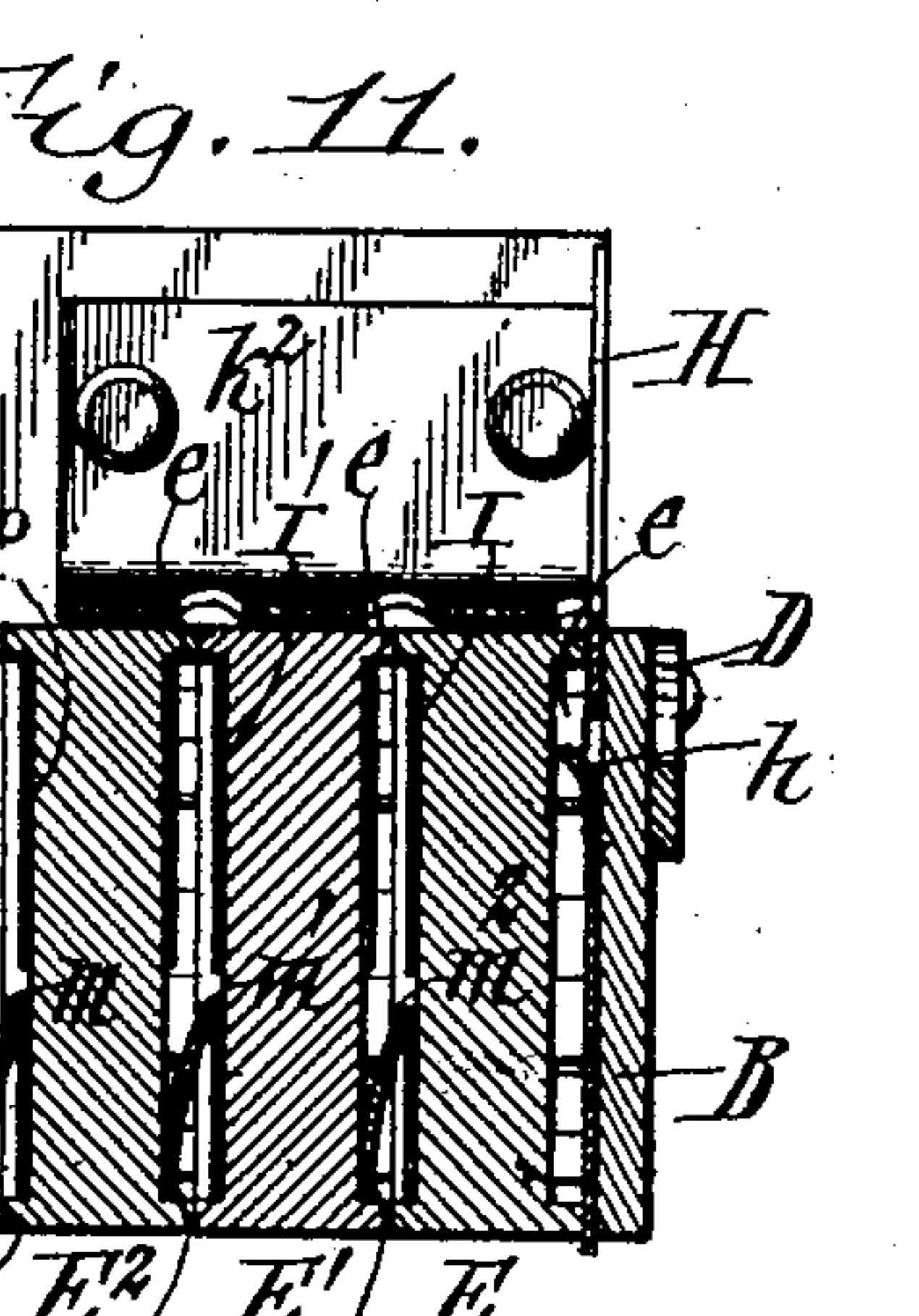
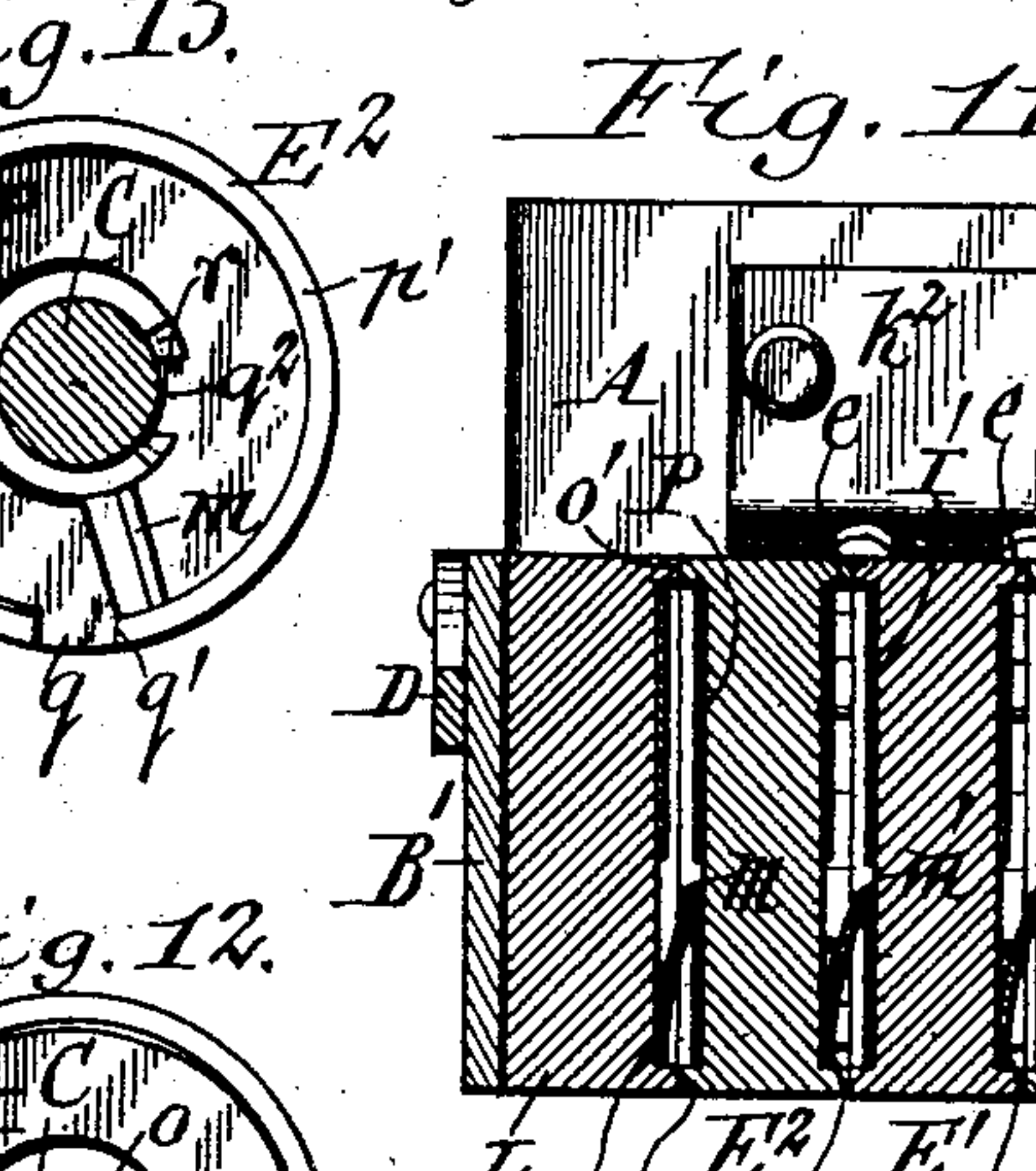
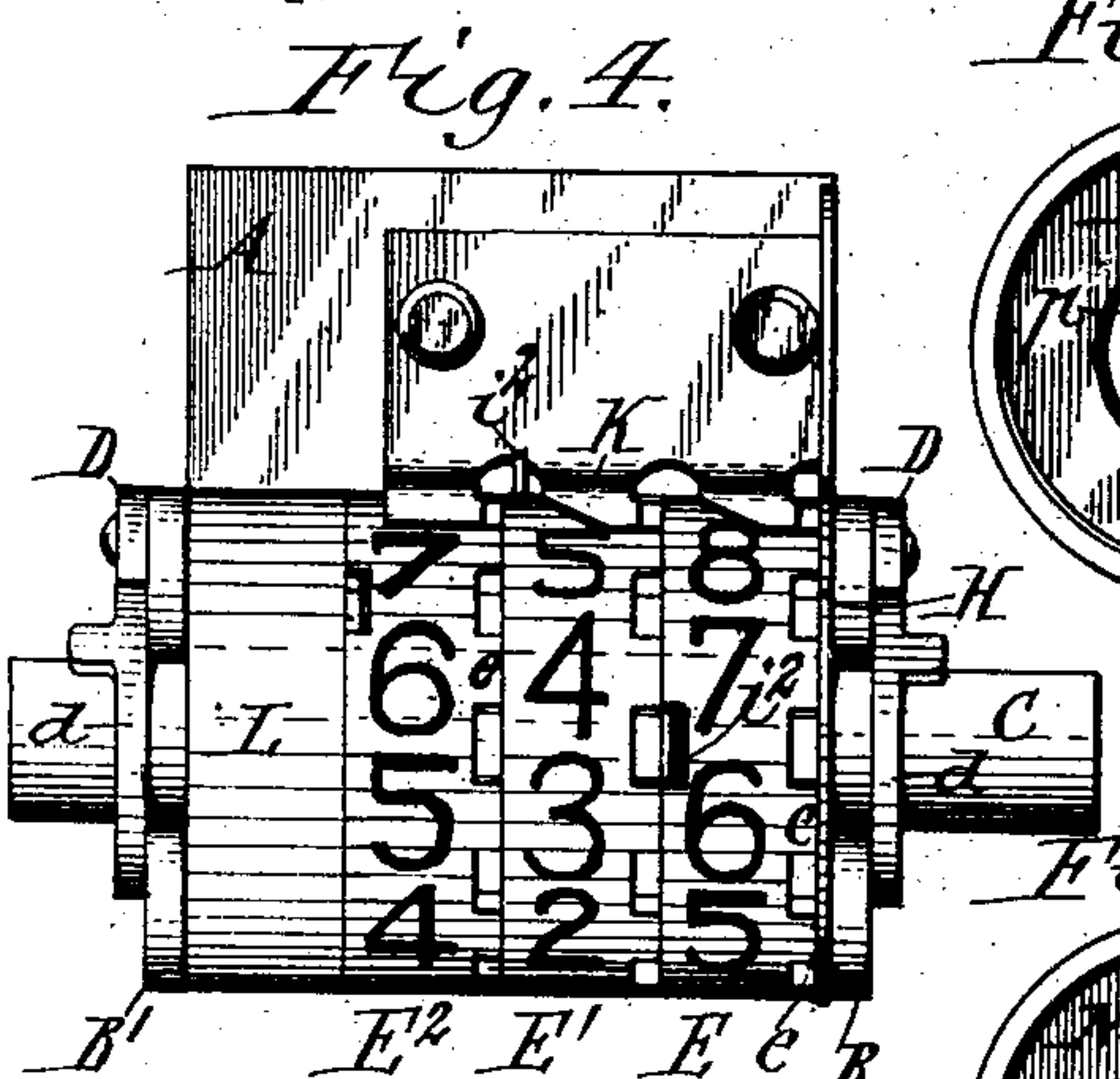
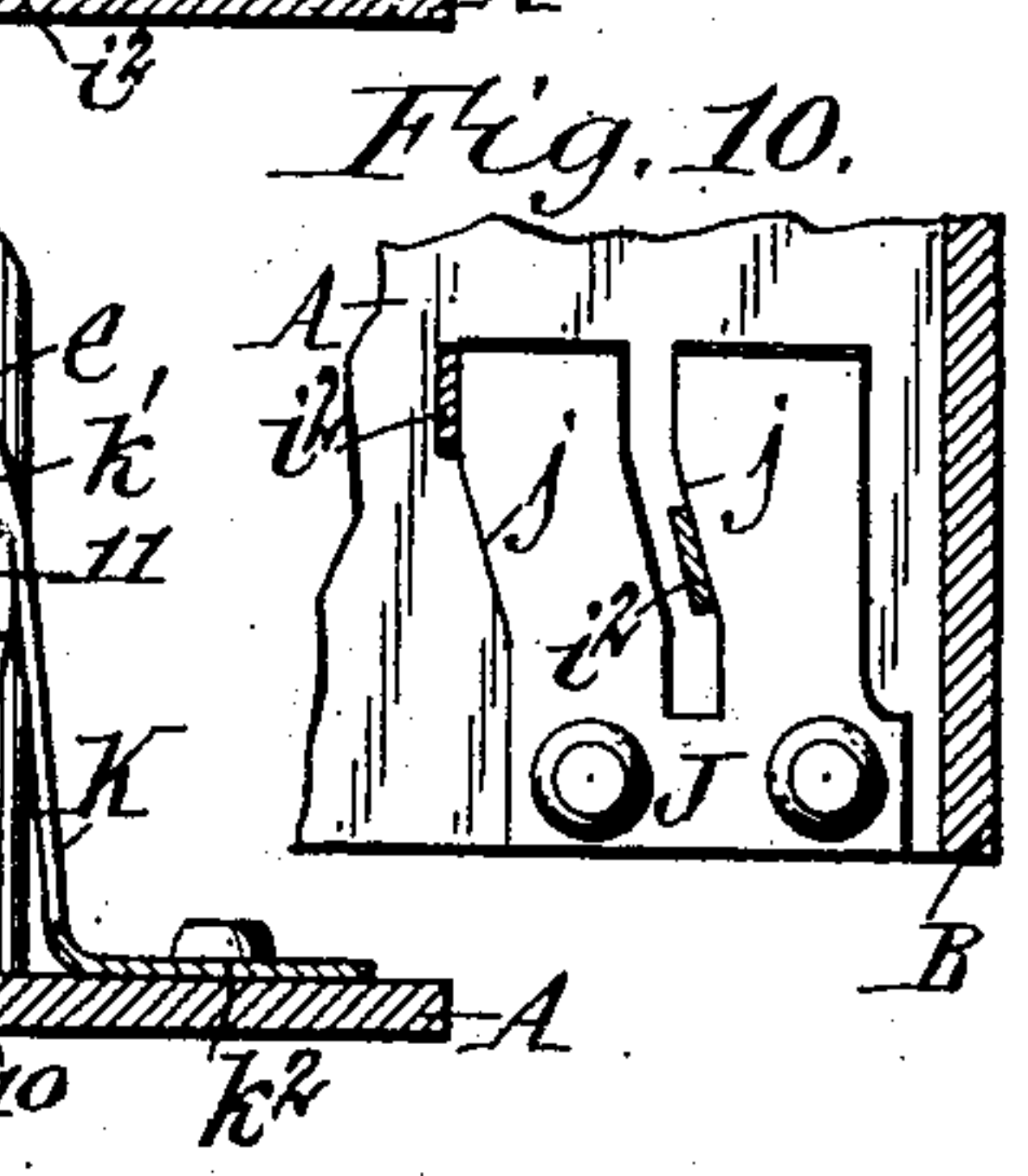
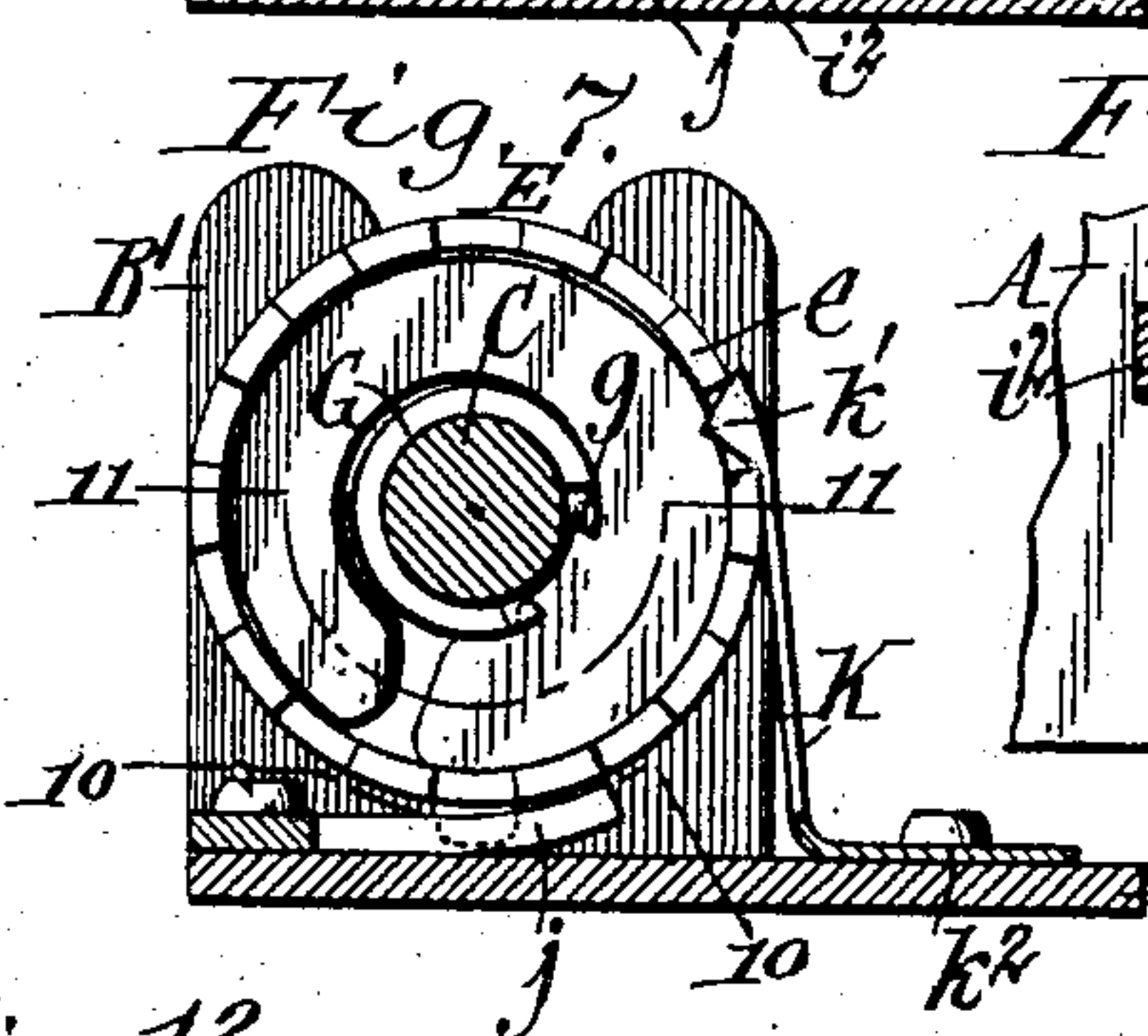
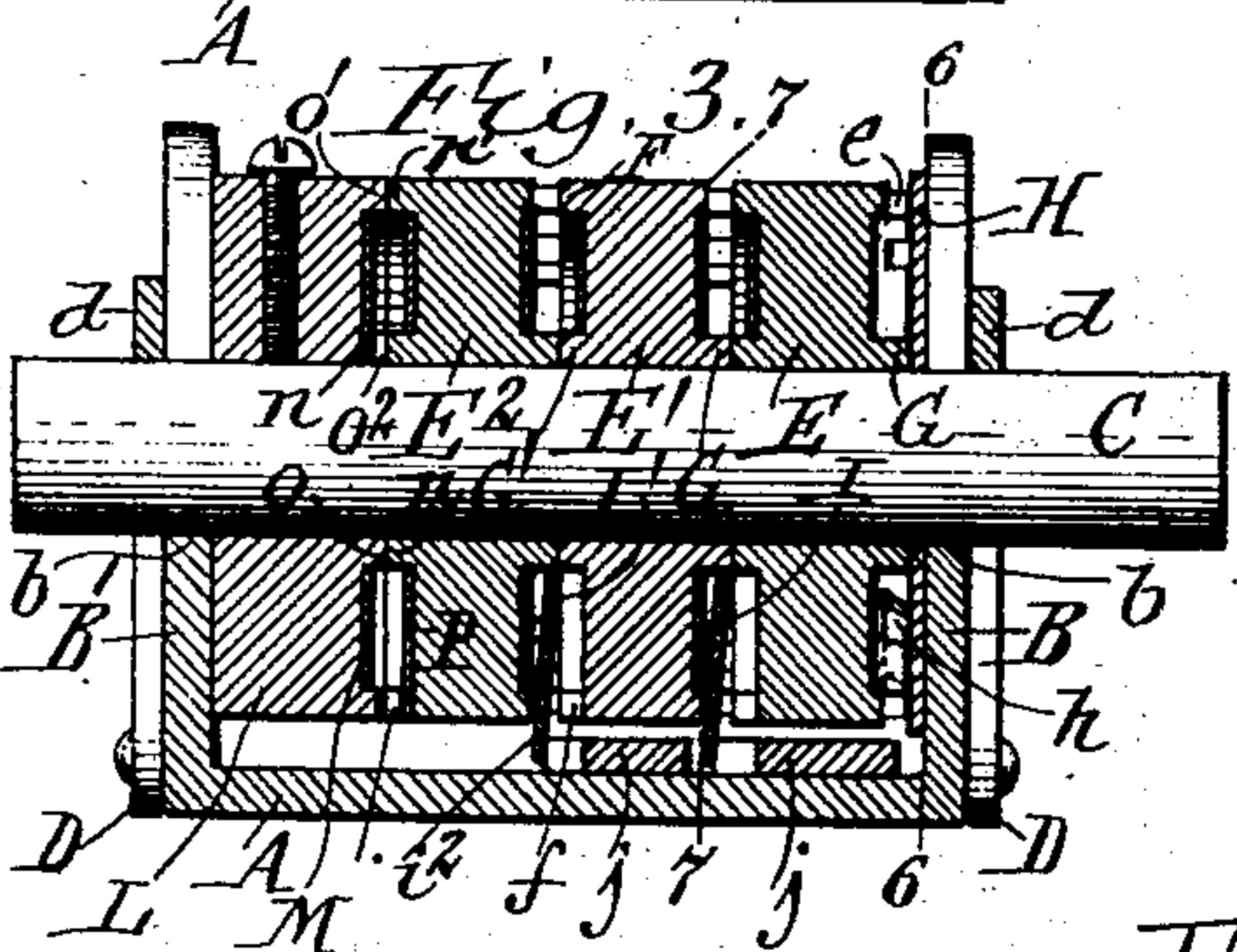
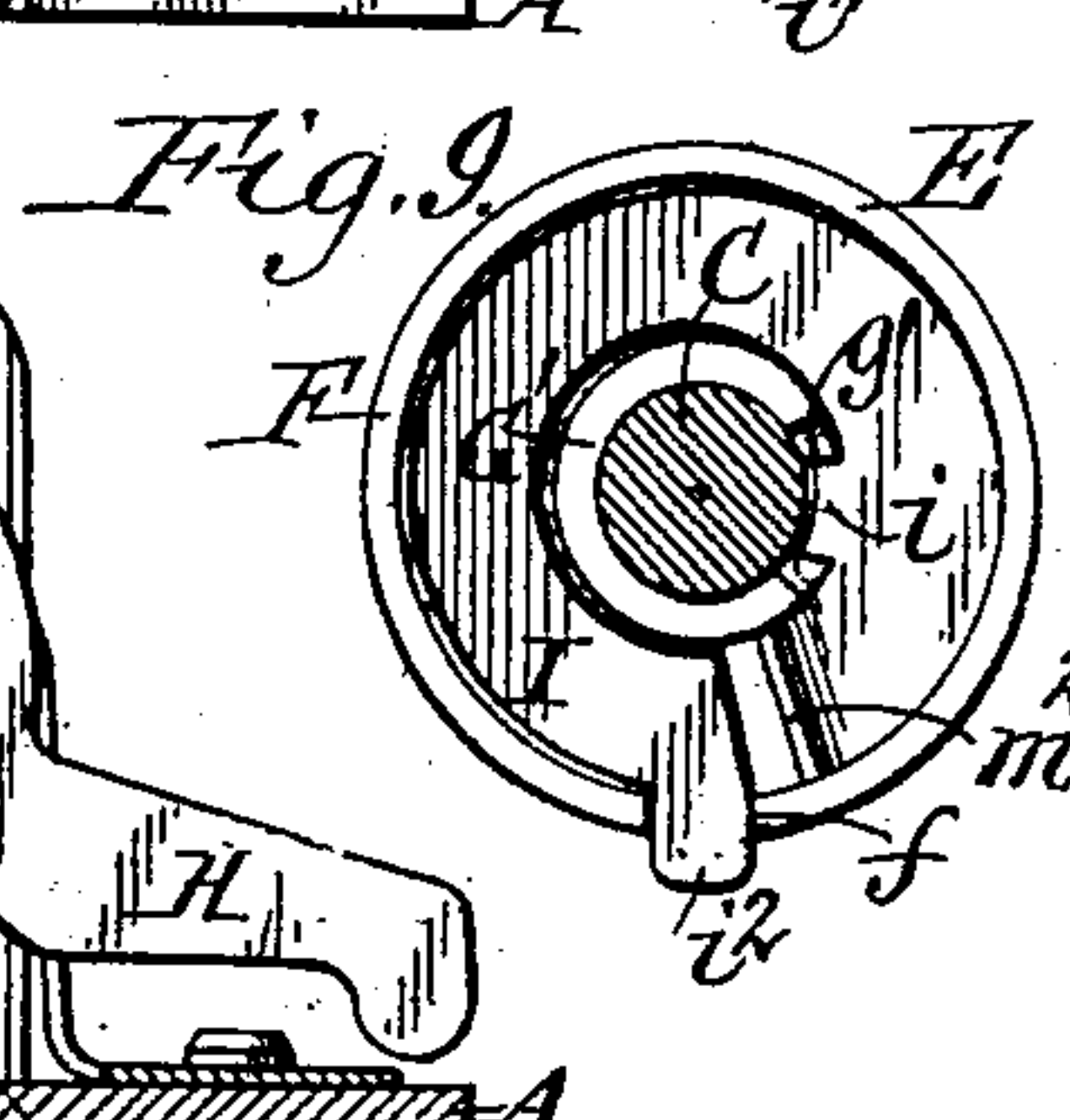
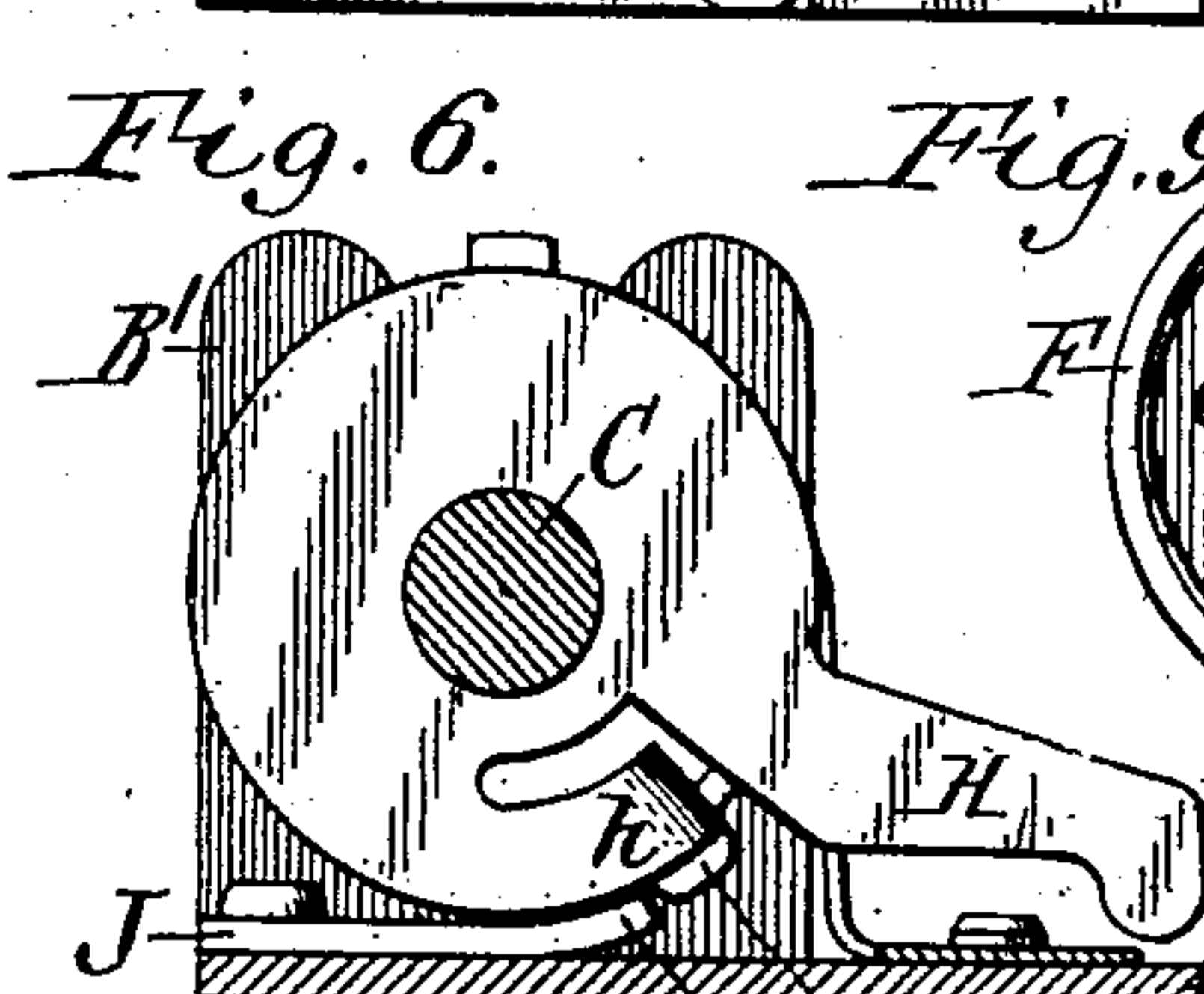
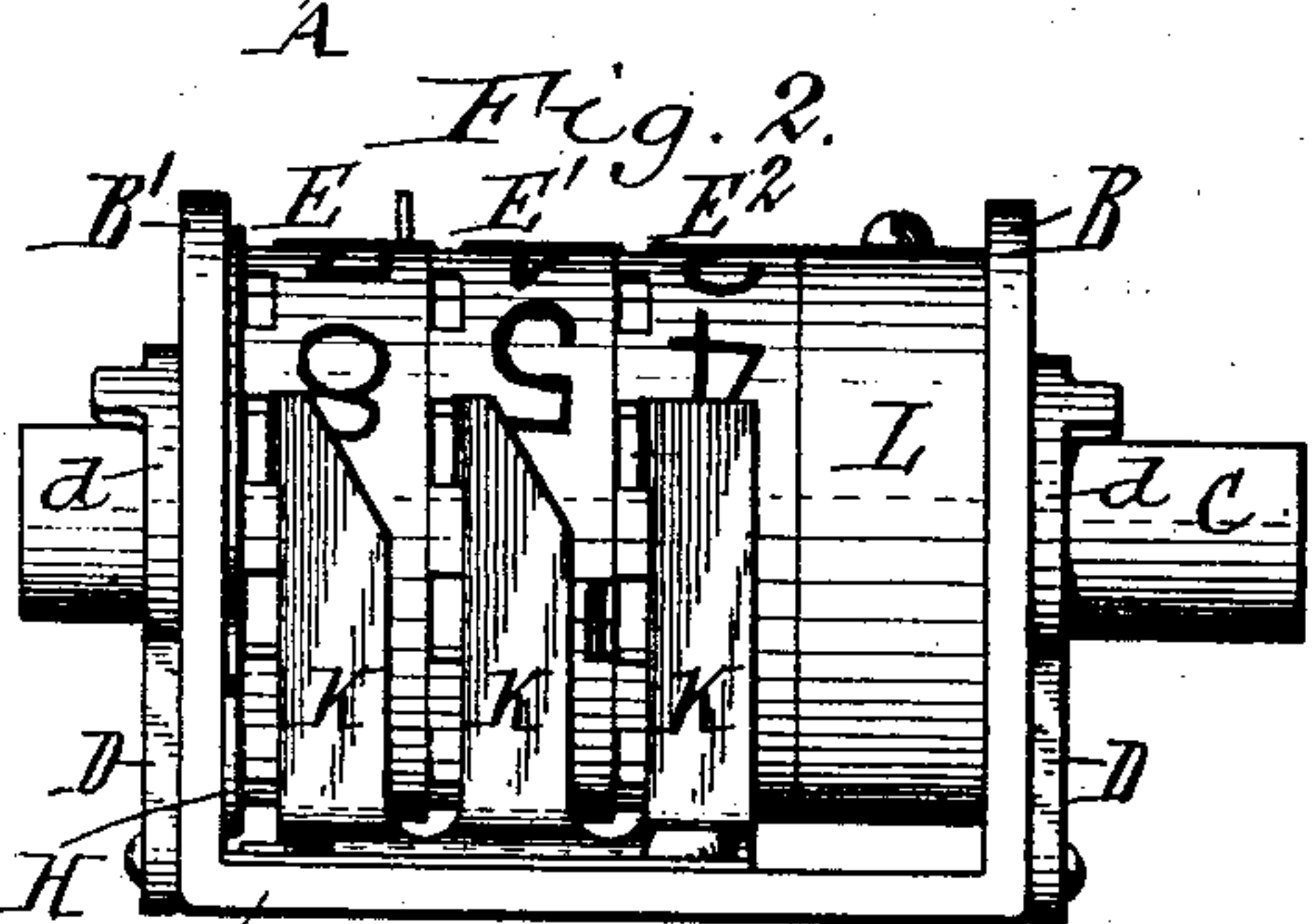
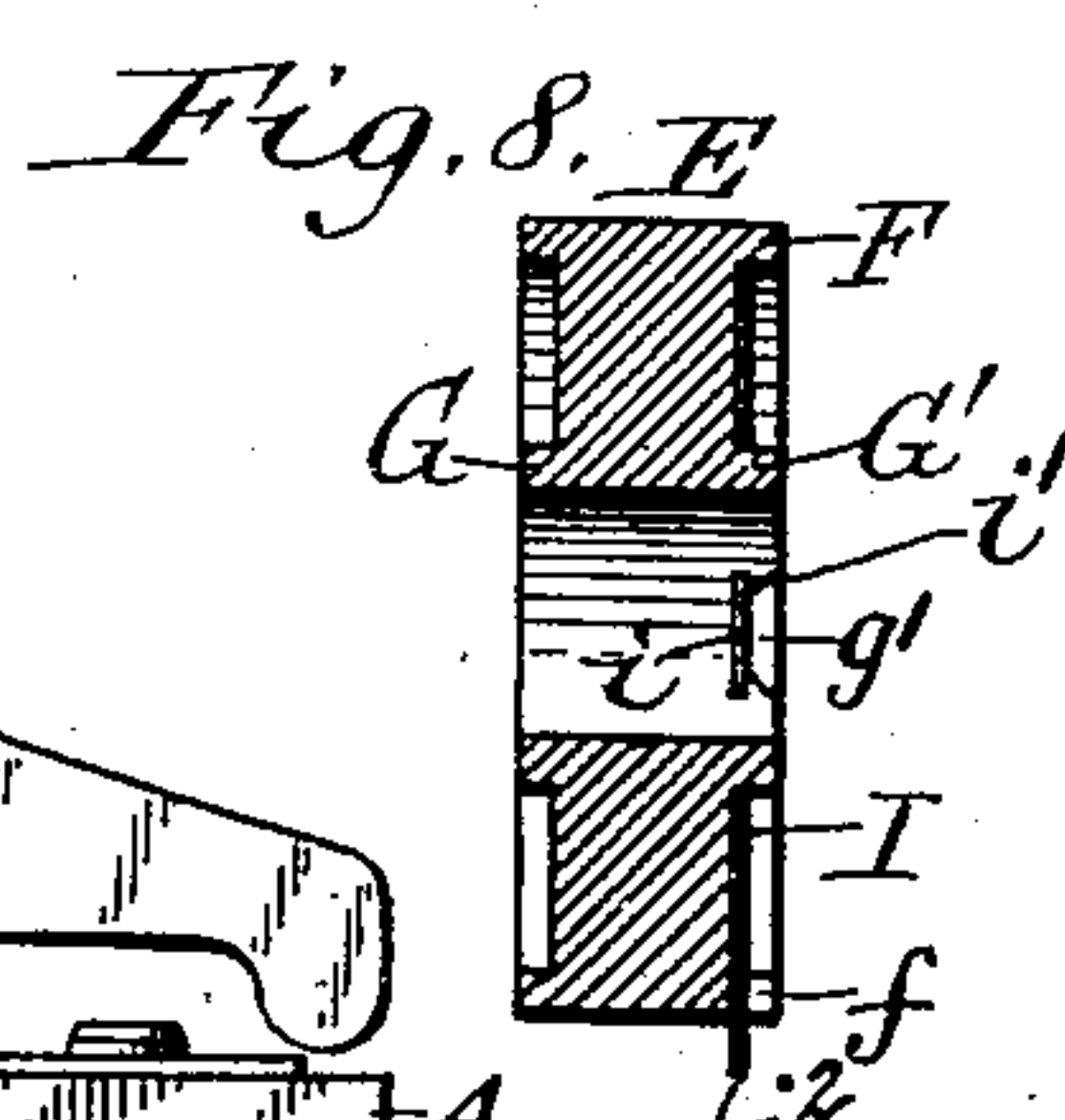
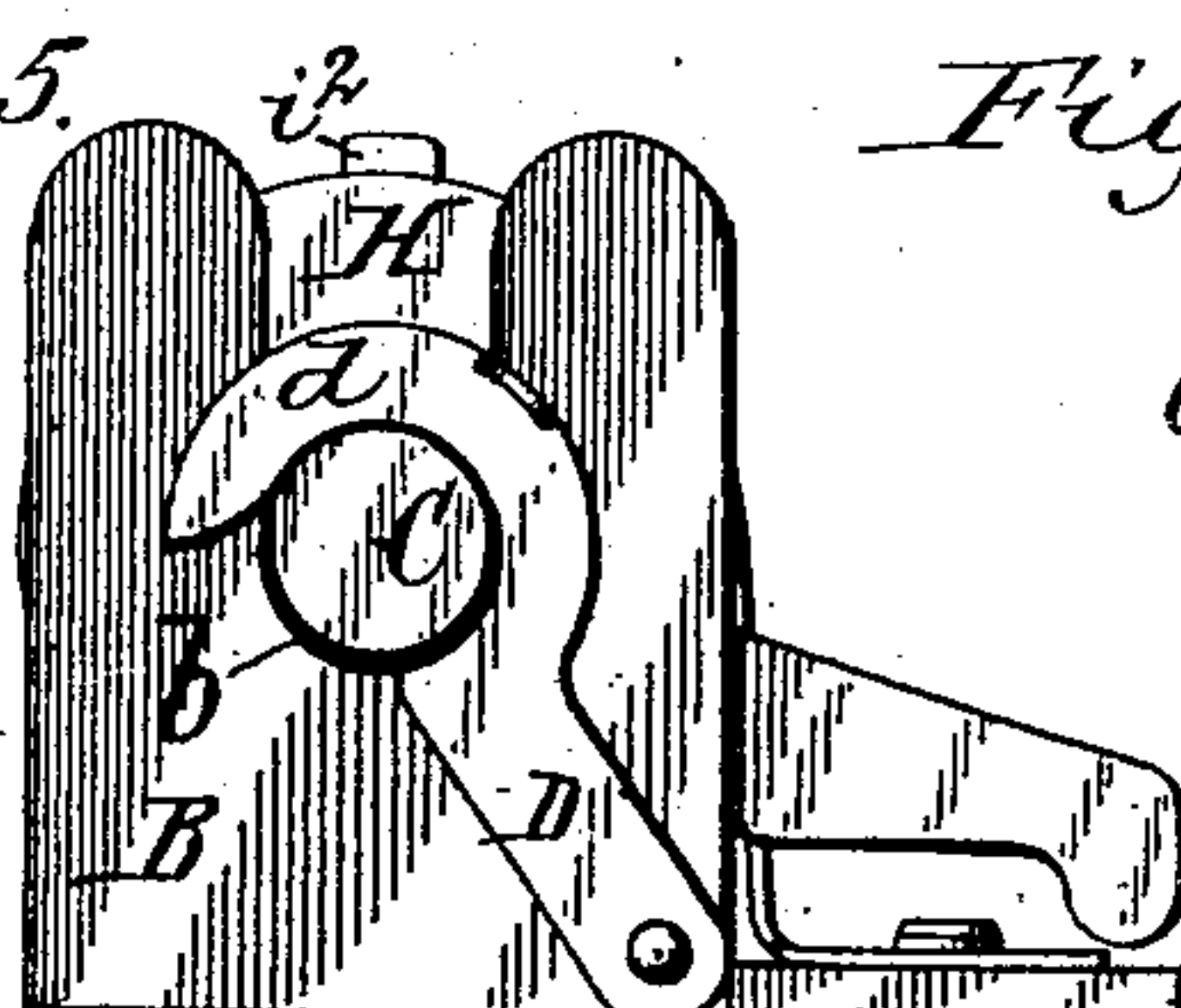
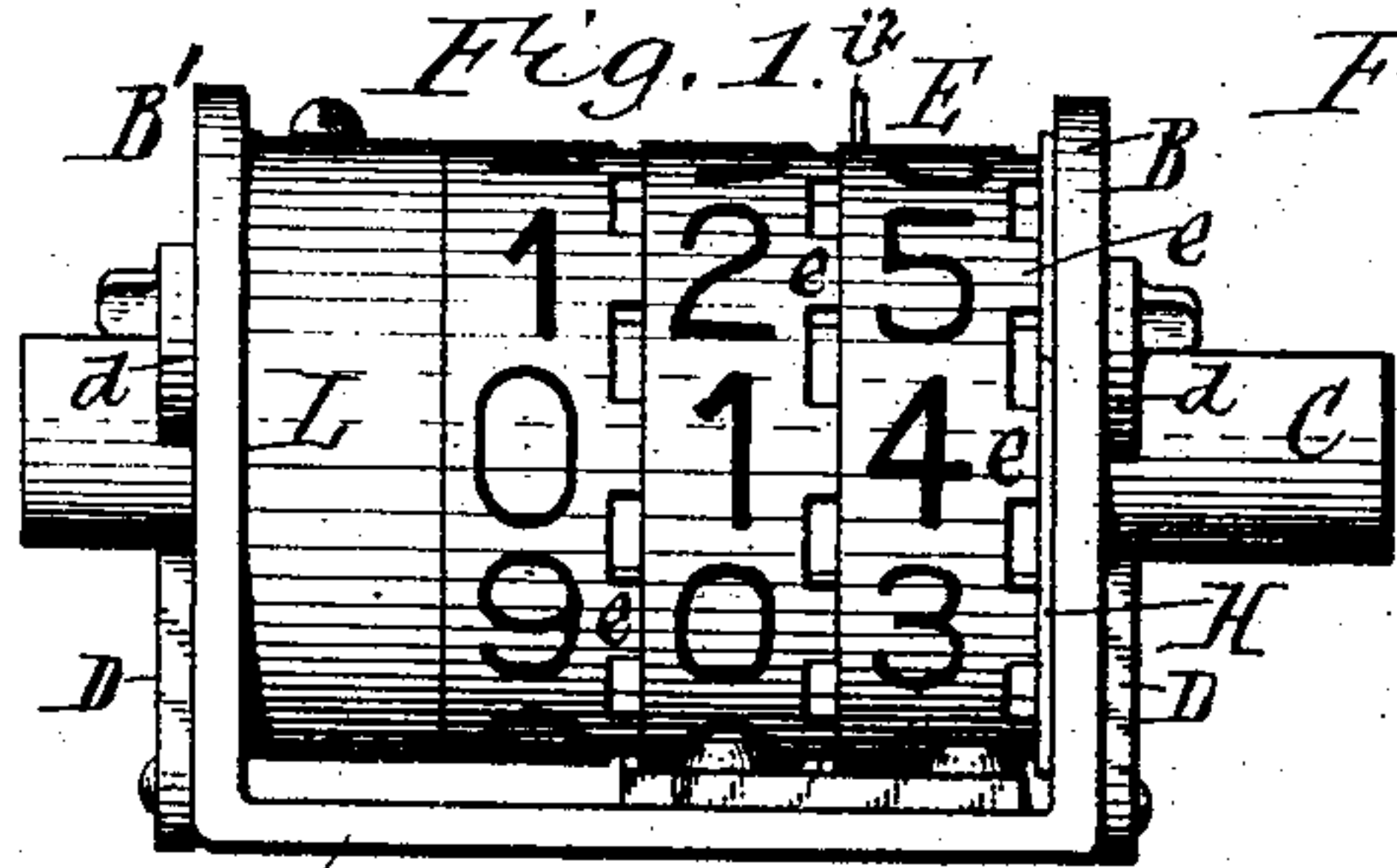


M. H. JOHNSON.  
REGISTER.

APPLICATION FILED SEPT. 19, 1903.

NO MODEL.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

MARQUIS H. JOHNSON, OF BUFFALO, NEW YORK, ASSIGNOR TO JOSEPH F. ROSSELLI, OF BUFFALO, NEW YORK.

## REGISTER.

SPECIFICATION forming part of Letters Patent No. 765,342, dated July 19, 1904.

Application filed September 19, 1903. Serial No. 173,805. (No model.)

*To all whom it may concern:*

Be it known that I, MARQUIS H. JOHNSON, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Registers, of which the following is a specification.

This invention relates to that class of registers containing a plurality of wheels arranged side by side and having the numbers on their peripheries.

The object of this invention is to produce a register of this character which is simple and compact in construction and reliable in operation and which can be manufactured at comparatively small cost.

In the accompanying drawings, Figure 1 is a front elevation of my improved register. Fig. 2 is a rear elevation thereof. Fig. 3 is a vertical longitudinal section of the register, taken centrally through the same. Fig. 4 is a top plan view thereof. Fig. 5 is an end view of the register. Figs. 6 and 7 are vertical transverse sections in lines 6-6 and 7-7, Fig. 3, respectively. Fig. 8 is a detached axial section of one of the number wheels or disks. Fig. 9 is a side view of the same. Figs. 10 and 11 are horizontal sections in lines 10-10 and 11-11, Fig. 7, respectively. Fig. 12 is a side view of the resetting-wheel and its pawl. Fig. 13 is a side view of the highest register-wheel and its coupling device.

Similar letters of reference indicate corresponding parts throughout the several views. The frame or support of the register shown in the drawings consists of a horizontal base or plate A and two upright plates or standards B B', arranged at opposite ends of the base. Each of the standards is provided with a notch or recess extending downwardly from the upper end of the standard and forming at its lower end a half-bearing b.

C represents a horizontal register-shaft arranged in the recesses of both standards and journaled on the under side in the half-bearings b. This shaft is confined in these recesses

and upon said bearings by catches D, pivoted at their lower ends on the outer side of the standards and provided at their upper ends with semicircular hooks d, which engage over the shaft and form upper half-bearings for said shaft. By swinging these catches out or into engagement with the shaft the latter can be readily removed or held in its bearings.

E E' E<sup>2</sup> represent the denomination wheels or disks, representing, respectively, units, tens, and hundreds of the registers, which are mounted loosely in the proper order axially in line or side by side on the shaft between its standards and each of which is numbered on its periphery from "0" to "9," inclusive, in the manner common to this type of registers. On the front side of each register-wheel along its periphery or margin the same is provided with an annular row of ten teeth e, which are spaced equidistant and face the next lower wheel. On its rear side each register-wheel is provided with an annular flange F at its margin or periphery, which contains a notch or recess f. The bore of each register-wheel is provided on opposite sides with annular front and rear flanges G G', which form the hub of the wheel. The front and rear flanges of the tens and hundreds wheels have notches or recesses g g', respectively; but the units-wheel has a notch g' only in its rear hub-flange.

H represents an actuating rock-arm for effecting the registering movement of the wheels. This arm is mounted on the shaft between the front standard B and the units-wheel E and may be oscillated one-tenth of a circle by any suitable means. The actuating-arm is provided with a pawl h, which is arranged to engage the teeth of the units-wheel and advance the same one space during the forward movement of the arm and to clear said teeth during its backward movement independent of the wheel. The actuating-arm and its pawl are preferably formed integrally from a piece of spring sheet metal, as shown in Fig. 6, the end of the pawl being deflected



toward the units-wheel, as shown in Fig. 11, to permit the same to properly engage its teeth.

I represents a transfer or carrying pawl whereby the units-wheel at the end of each rotation is temporarily coupled with the tens-wheel, and I' is a similar pawl for temporarily coupling the tens-wheel at the end of each rotation with the hundreds-wheel. Each of the transfer-pawls is constructed of spring sheet metal in the form of a split ring or crescent and is arranged between the peripheral and hub flanges on the rear side of its respective wheel. The transfer-pawl is interlocked with its wheel by means of a lip or lug  $i$  formed on its inner edge near one end and secured in the recess  $g'$  of the rear hub-flange by clenching or bending the edges or end walls of this recess over the lip, as shown at  $i'$ , Fig. 8. The free end of the transfer-pawl is provided with a tongue  $i^2$ , which projects laterally through the recess  $f$  in the outer flange F of the respective wheel and beyond the periphery thereof, as shown in Figs. 1, 5, and 9. In the normal position of the transfer-pawl which it occupies during nine-tenths of a complete rotation the resilience of the pawl retracts its tongue wholly within the recess  $f$ , so that its wheel rotates without affecting the wheel next in advance of the same. During the last tenth of each rotation of the units register-wheel the tongue of its transfer-pawl is deflected or moved laterally and caused to enter the space between two teeth of the tens register-wheel, thereby coupling these two wheels and causing them to turn together. The transfer-pawl remains in its coupling position during one-tenth of a rotation of the wheel for advancing the higher wheel one number, and then the pawl is retracted from the higher wheel, so that the lower wheel continues its intermittent forward movement independent of the higher wheel. During the last one-tenth of a rotation of the tens-wheel the same is coupled in like manner with the hundreds-wheel for advancing the same one number. The preferred means for engaging and disengaging the transfer-pawl of a lower wheel with the teeth of a higher wheel consists of a cam  $j$ , formed on a plate J, which is secured to the base of the frame. The two cam-plates which shift the transfer-pawls for coupling the units and tens wheels and the pawl for coupling the tens and hundreds wheels are preferably formed in one piece, as shown in Fig. 10, and the operative parts of these cam-plates are curved concentrically with the register-wheels, so that the tongues of the transfer-pawls engage the same properly.

For the purpose of holding the register-wheels against accidental displacement a detent device is provided, which preferably consists of a plurality of detent-pawls K, each of

which is arranged vertically in rear of the register-wheels and is provided with a V-shaped nose  $k'$ , which enters the space between two teeth of the register-wheel. The detent-pawls of the several register-wheels are preferably formed out of a single sheet of spring metal and are connected at their lower ends by a horizontal plate  $k^2$ , which is secured to the base of the frame. The tension of the detent-pawls is sufficient to hold the register-wheels against turning ordinarily; but these pawls yield and permit the wheels to turn when sufficient power is applied to overcome the tension of the detent-pawls.

The means for resetting the register to zero or turning the same to the starting position is constructed as follows:

L represents a resetting wheel or disk rigidly secured on the shaft between the highest or last register-wheel and the rear standard of the frame.

M M' M<sup>2</sup> represent resetting-pawls mounted, respectively, on the resetting hundreds and tens wheels and constructed to engage with stops or shoulders  $m$   $m'$   $m^2$  on the hundreds, tens, and units wheels for coupling these wheels when their restoration to zero is desired. Each of the resetting-pawls is preferably constructed of spring sheet metal in the form of a split ring or crescent, which is provided near its fixed end with an inwardly-projecting lip  $n$ , while its free end is bent laterally. The pawl M of the resetting-wheel is arranged in an annular groove formed on its front side by an inner annular flange  $o$ , arranged around its bore, and an outer annular flange  $o'$ , arranged at its margin or periphery. The resetting-pawl M is secured to the resetting-wheel by engaging its lip  $n$  with a recess  $o^2$  in the inner flange  $o$  and clenching or bending the edges of said recess over the lip in the same manner in which the transfer-pawls are secured to their wheels.

The shoulder  $m$  of the hundreds-wheel is formed by a lateral bend on one end of a split ring or crescent P, which is seated in an annular groove formed on the rear side of the hundreds-wheel between an inner annular flange  $p$ , arranged around its bore, and an outer annular flange  $p'$ , arranged at its margin or periphery. The stop-ring is held in place on the hundreds-wheel by means of a tongue  $q$ , projecting laterally therefrom into a recess or notch  $q'$  in the outer flange  $p'$ , and a lip  $q^2$ , arranged on the inner edge of the ring P and secured in a recess  $r$  in the inner flange  $p$  by clenching or bending the edges of the same over the lip in the same manner in which the transfer-pawls are secured to their wheels. The stops or shoulders  $m'$   $m^2$  of the units and tens wheels are formed by bending the fixed ends of the transfer-pawls I I' laterally, as shown in Figs. 9 and 11.



It will be noted that the ring for supporting the resetting stop or shoulder on the hundreds-wheel is in all respects like the rings on the units and tens wheels forming the transfer-pawls II', excepting that the tongue of the stop-ring P does not project beyond the periphery of the hundreds-wheel.

The resetting-pawls are preferably so arranged that they engage with the shoulders on the wheels in front of the same upon moving the resetting-pawls forwardly or in the same direction as the counting movement of the wheels; but when the registering-wheels move forward relatively to the resetting-pawls the shoulders of said wheels deflect the free ends of the pawls in tripping past the same. When it is desired to reset the register-wheels to zero, the shaft is turned forward or in the same direction in which the register-wheels move in counting numbers. During this movement the resetting-pawl M turns idly until it engages the shoulder  $m$  of the hundreds-register, and then the latter is compelled to turn with the shaft. In like manner the tens and units wheels are successively coupled with the shaft by the resetting-pawl M' on the hundreds-wheel engaging with the shoulder  $m'$  on the tens-wheel and the resetting-pawl M<sup>2</sup> of the latter engaging with the shoulder  $m^2$  of the units-wheel. After all the register-wheels have been thus coupled with the shaft all the numbers of the same order are in line. The usual casing for the register is provided, having a sight-aperture through which a line of numbers on the register-wheels is visible. Any suitable means may be employed for arresting the movement of the shaft when all the register-wheels have been turned to zero and the row of ciphers is opposite the aperture in the inclosing casing.

I claim as my invention—

1. In a register, the combination of a plurality of denomination-wheels arranged axially in line each higher wheel having an annular row of teeth facing the next lower wheel, a transfer-pawl secured at one end to a lower wheel and projecting at its opposite end beyond the periphery of the wheels, and a stationary cam arranged wholly outside of the periphery of said wheels and in position to be engaged by the outer end of said pawl for shifting the same into engagement with said teeth, substantially as set forth.

2. In a register, the combination of a plurality of denomination-wheels arranged axially in line each higher wheel having an annular row of teeth on its front side and each lower wheel having an annular flange on its rear side provided with a recess, a transfer-pawl secured at one end to a lower wheel while its opposite end projects through said recess beyond the periphery of said wheels, and a stationary cam arranged outside of said

wheels in position to be engaged by the outer end of said pawl and shift the same into engagement with said teeth, substantially as set forth.

3. In a register, the combination of a plurality of wheels arranged axially in line, each lower wheel having an inner annular flange on its rear side which is provided with a recess and each higher wheel having teeth on its front side, a transfer-pawl having a lip at one end which is secured in said recess by bending the end walls of the same over said lip while its opposite end projects beyond the periphery of the wheels, and a cam arranged to be engaged by said pawl for shifting the same into engagement with said teeth, substantially as set forth.

4. In a register, the combination of a plurality of denomination-wheels arranged axially in line, each higher wheel having an annular row of teeth on its front side and each lower wheel having an annular flange on its rear side and provided with a recess, a crescent-shaped transfer-pawl secured at one end to the front side of the lower wheel and provided at its opposite end with a tongue projecting laterally through said recess beyond the periphery of said lower wheel, and a stationary cam arranged to engage said tongue and shift the same into engagement with said teeth, substantially as set forth.

5. In a register, the combination of a plurality of denomination-wheels arranged axially in line, each higher wheel having an annular row of teeth on its front side and each lower wheel having an inner annular flange provided with a recess and an outer annular flange provided with a recess, a crescent-shaped transfer-pawl having an inwardly-projecting lip near one end which is secured in the recess of the inner flange by bending the end walls of said recess over said lip and a tongue at its opposite end which projects laterally through the recess in the outer flange and beyond the periphery of the respective wheel, and a stationary cam for engaging said tongue and shifting the same into engagement with said teeth, substantially as set forth.

6. In a register, the combination of a plurality of wheels arranged axially in line, each lower wheel having a shoulder on its rear side, and each higher wheel having an inner annular flange provided with a recess, and a crescent-shaped resetting-pawl having an inwardly-projecting lip at one end which is secured in said recess by bending the end walls of the same over the lip while its opposite end is deflected laterally so as to engage said shoulder of the next lower wheel, substantially as set forth.

7. In a register, the combination of a plurality of denomination-wheels arranged axi-



ally in line, each higher wheel being provided on its front side with an annular row of teeth, a crescent-shaped transfer-pawl secured to the rear side of each lower wheel and provided at  
5 one end with a laterally-projecting shoulder and at its opposite end with a tongue, a stationary cam for shifting said tongue into engagement with the teeth on the adjacent higher wheel, and a crescent-shaped resetting-pawl  
10 secured at one end on the front side of each higher wheel and adapted to engage its opposite end with the opposing shoulder, substantially as set forth.

8. In a register, the combination of a frame provided with standards having half-bearings, 15 a shaft journaled on one side in said bearings, a catch engaging over the opposite side of said shaft, and denomination-wheels mounted on said shaft between the standards, substantially as set forth. 20

Witness my hand this 16th day of September, 1903.

MARQUIS H. JOHNSON.

Witnesses:

THEO. L. POPP,  
EMMA M. GRAHAM.