S. MOE.

NUMBERING MACHINE.

APPLICATION FILED DEC. 6, 1907.

952,682.

Patented Mar. 22, 1910.

3 SHEETS—SHEET 1.

Fig. 1

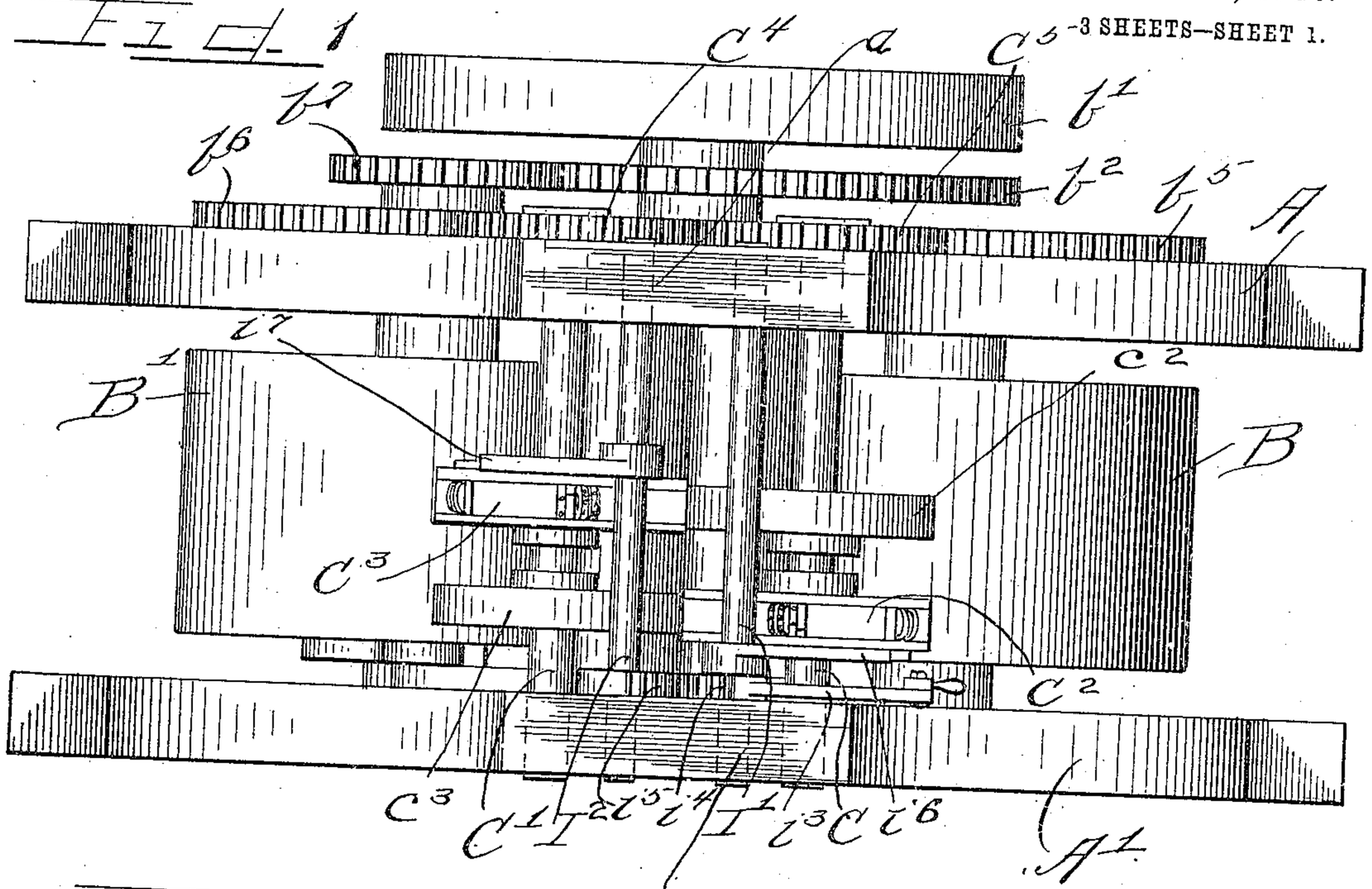


Fig. 11

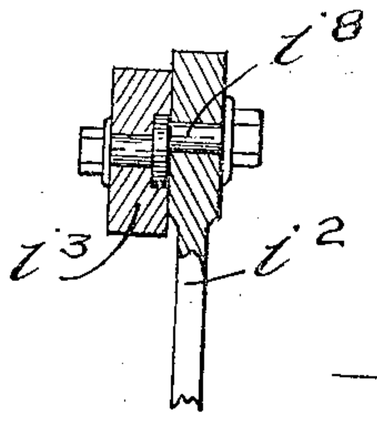


Fig. 10

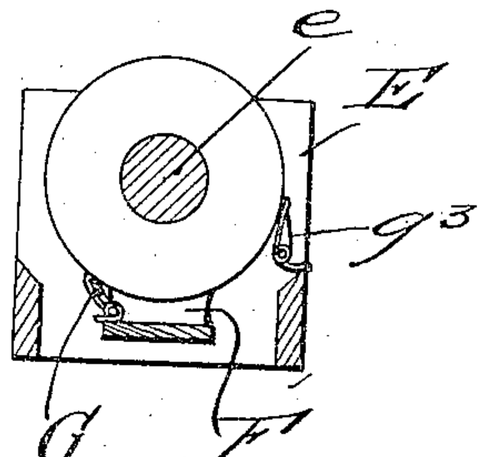


Fig. 9

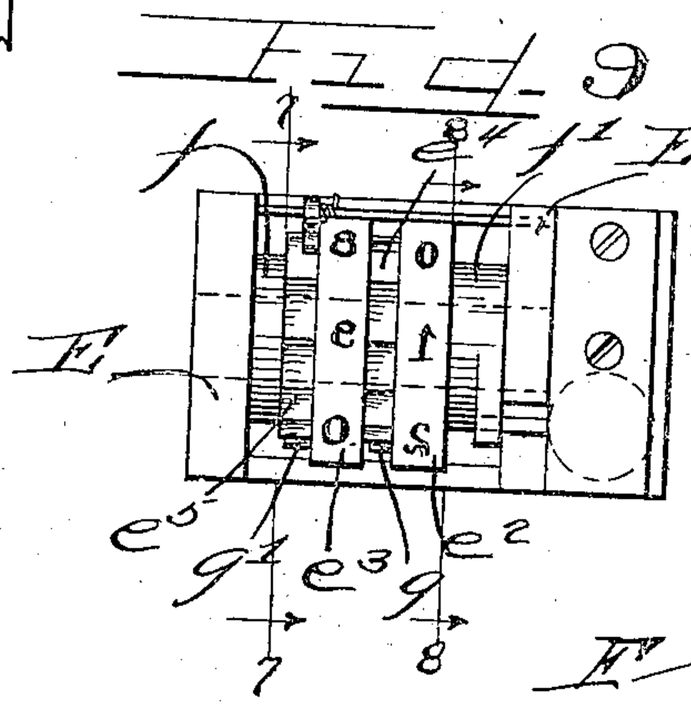
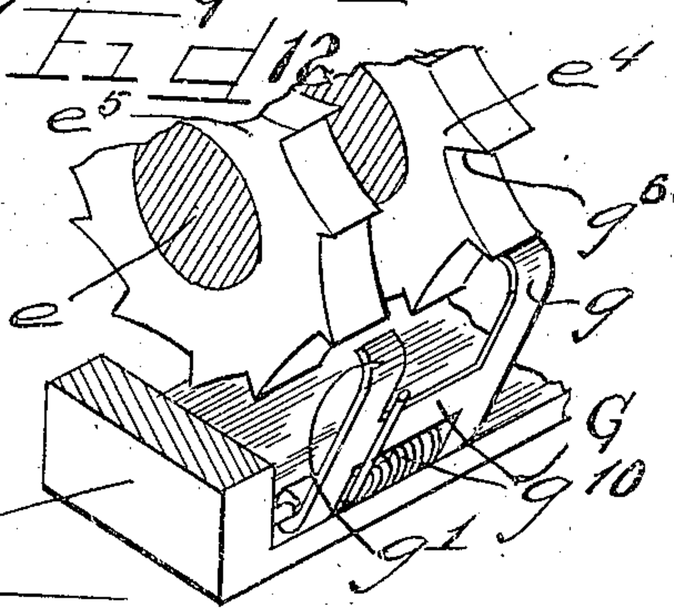


Fig. 12



Witnesses

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3 SHEETS—SHEET 2.

Fig. 2

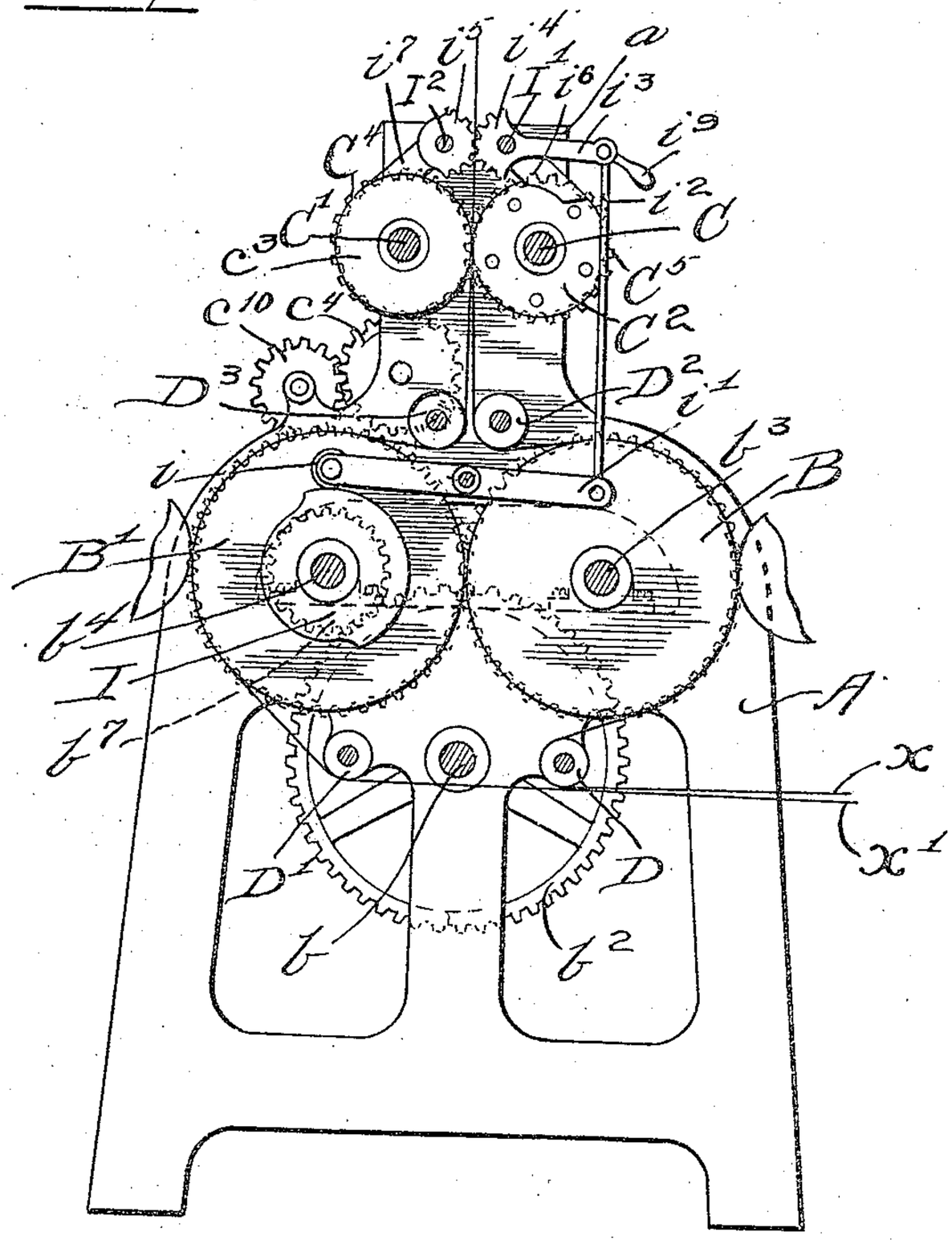


Fig. 6

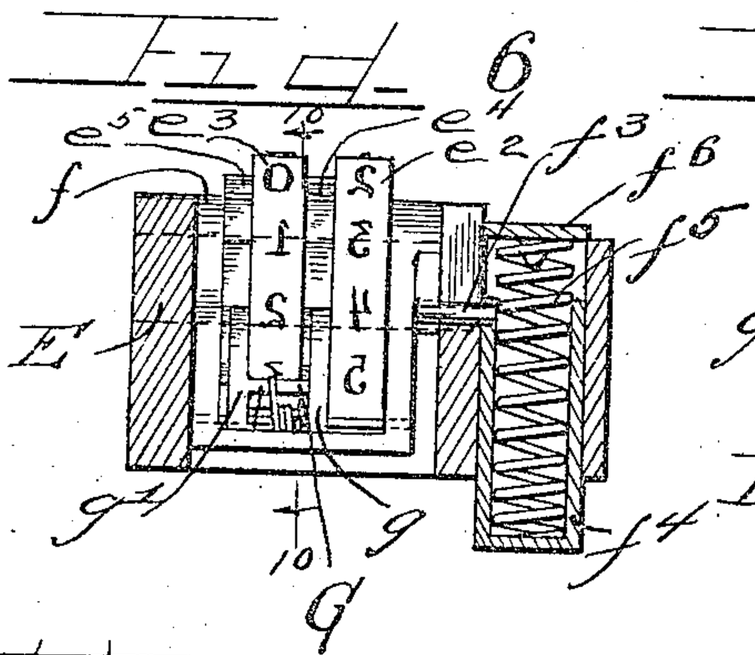


Fig. 7

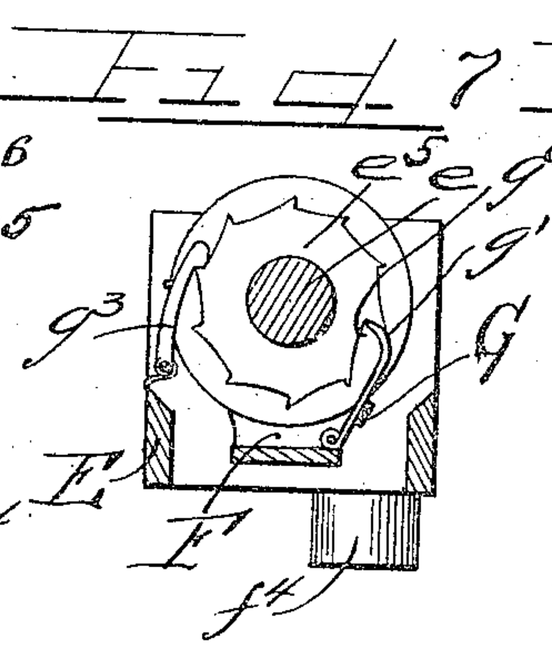
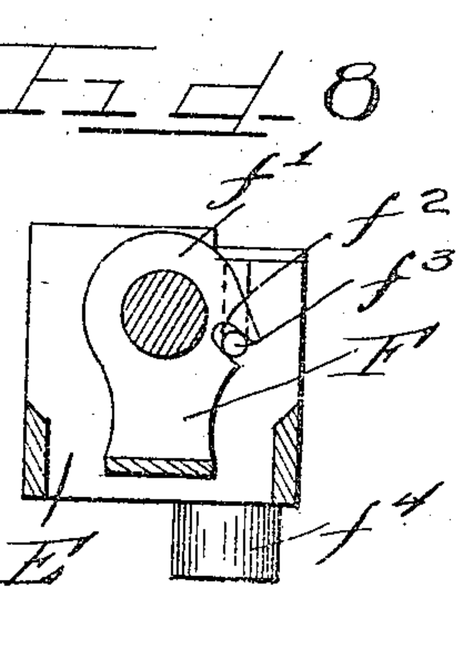


Fig. 8



Witnesses

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S. MOE.

NUMBERING MACHINE.

APPLICATION FILED DEC. 6, 1907.

952,682. Patented Mar. 22, 1910.

3 SHEETS—SHEET 3.

Fig. 3

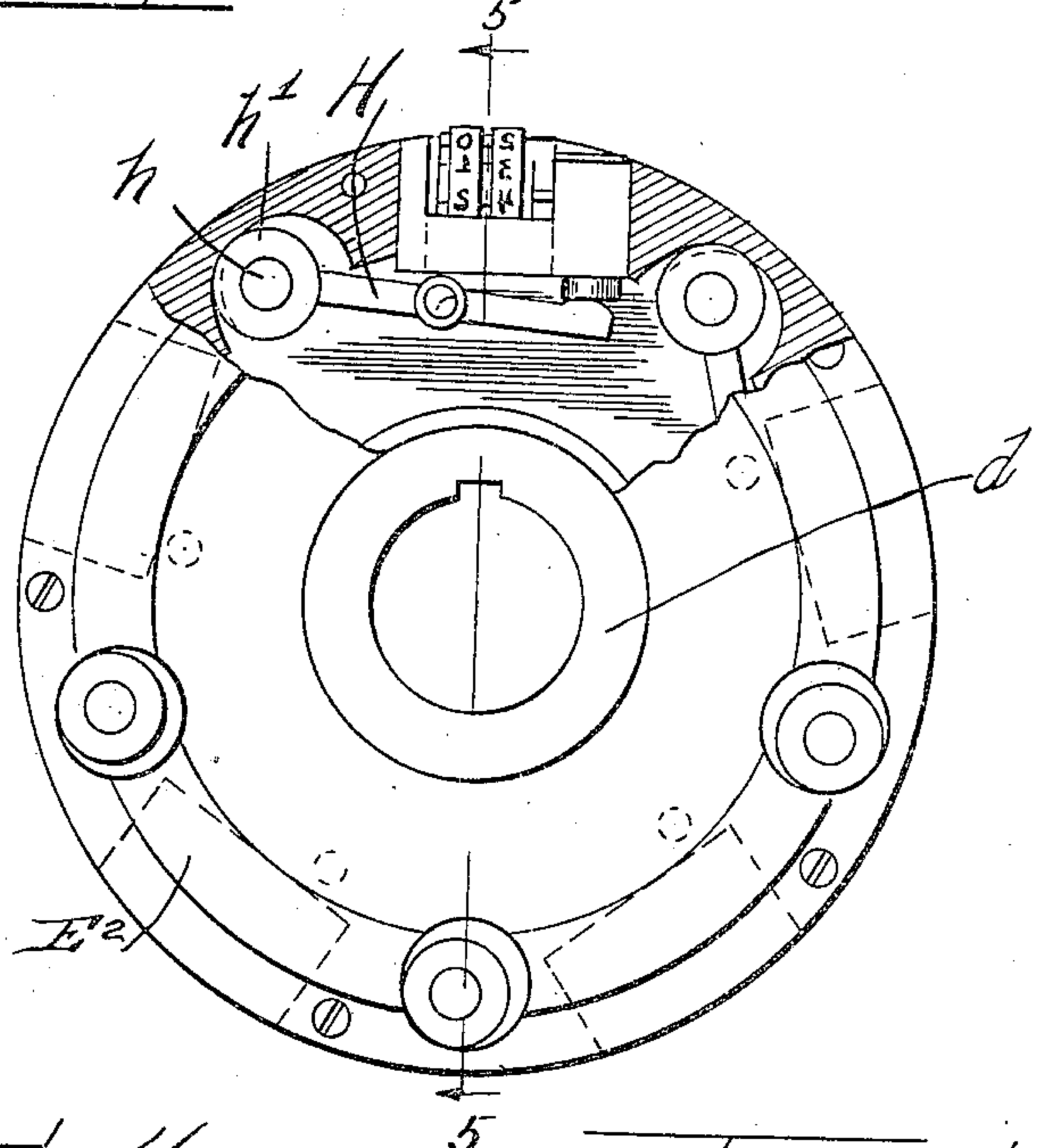


Fig. 4

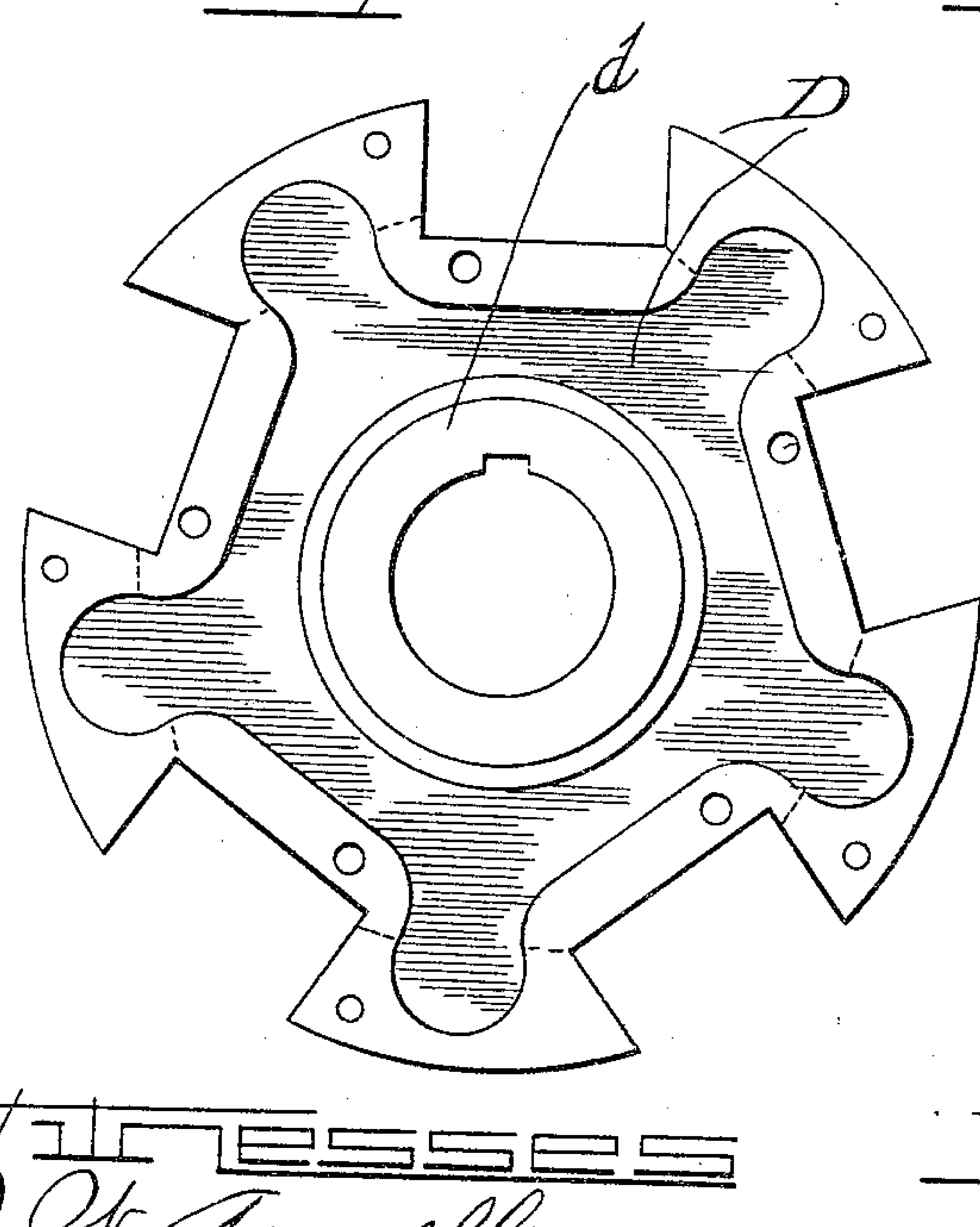
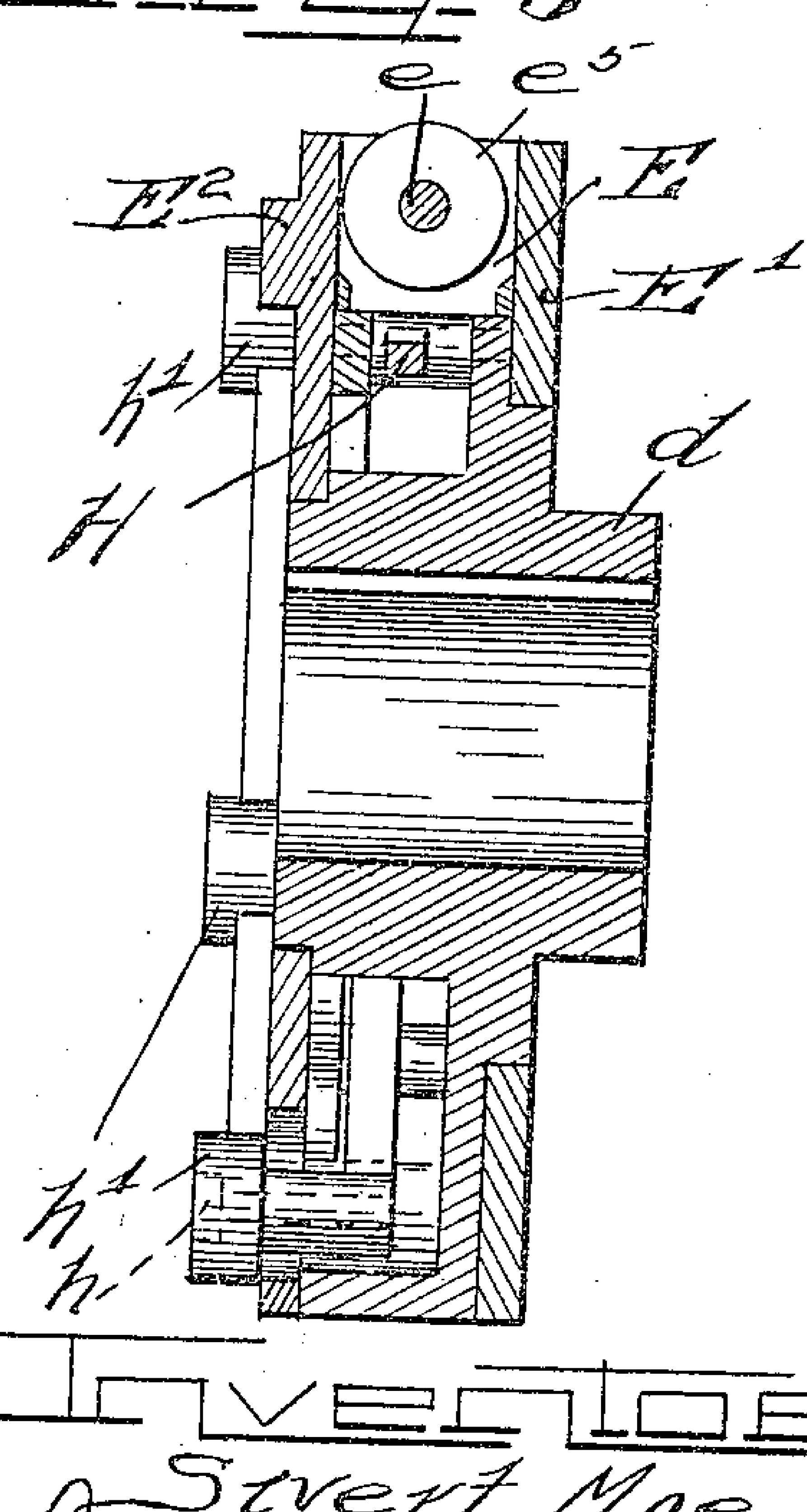


Fig. 5



Witnesses
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UNITED STATES PATENT OFFICE.

SIVERT MOE, OF CHICAGO, ILLINOIS.

NUMBERING-MACHINE.

952,682. Specification of Letters Patent. **Patented Mar. 22, 1910.**

Application filed December 6, 1907. Serial No. 405,360.

To all whom it may concern:

Be it known that I, SIVERT MOE, a citizen of the United States, and a resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Numbering-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of numbering machines adapted to be used in connection with printing presses for numbering pages of books or the like. Such numbering devices have usually been constructed to number the pages consecutively from one to any desired number.

It is an object of this invention to afford an exceedingly simple and accurate automatic numbering device for use in numbering the leaves of books and particularly the leaves of that class of sales books wherein a carbon duplicate for each charge check or ticket is made numbered to correspond with the original and serves for a voucher for the customer.

It is also an object of the invention to afford an automatically acting mechanism of the class described adapted to operate continuously without attention but adapted to be thrown out of action instantly by means of a suitable operating lever should it be necessary.

It is important to so construct the device that pages may be numbered consecutively or as is usually the case, printed in a succession of strips each strip consisting of a number of pages arranged in alinement all of which bear the same number the successive strips bearing consecutive page numbers so that when the strips are stitched together at intervals and severed transversely a number of books are correctly paged and with duplicate pages alternately inserted and paged to correspond with the original pages.

It is finally an object of this invention to afford an exceedingly cheap, simple and durable device of the class described adapted for general use or in connection with printing presses of any kind.

The invention embraces the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a top plan view of a machine embodying my invention and which may or may not be constructed as a part of a printing press. Fig. 2 is a central vertical section of the same. Fig. 3 is an enlarged fragmentary face view of one of the numbering wheels. Fig. 4 is a detail face view of the spider of the numbering wheel. Fig. 5 is a section taken on line 5—5 of Fig. 3. Fig. 6 is an enlarged sectional view illustrating the numbering mechanism. Fig. 7 is a section taken on line 7—7 of Fig. 9. Fig. 8 is a detail section taken on line 8—8 of Fig. 9. Fig. 9 is a top plan view of the numbering mechanism. Fig. 10 is a section on line 10—10 of Fig. 6. Fig. 11 is an enlarged sectional detail of the mechanism for manually throwing the shifting mechanism for the numbering disks out of operation. Fig. 12 is a detail of construction.

In said drawings: A—A′ indicate parallel frame members journaled in which is the main shaft b, provided on its outer end with a driving pulley b', adapted to receive a driving belt. Also secured on said shaft is a spur gear wheel b^2, as shown in Figs. 1 and 2. Journaled above said shaft and laterally thereof are shafts b^3—b^4, on which are impression rolls B—B′ arranged each to coact with a type roll bearing against the outer side thereof and which for convenience, is not shown. The shafts b^3—b^4 are provided on the driving end with gears b^5—b^6 respectively which intermesh, thereby driving said rolls oppositely. As shown also, the shaft b^4 is provided at its outer end with a pinion b^7 which meshes with the gear b^2 on the main driving shaft b, and from whence the impression rolls are driven. Journaled in an upper extension a of said frame members are parallel shafts C—C′ on which are the numbering wheels C²—C³ which are offset from each other on their respective shafts a distance dependent on the width of the strip to be numbered, and against each of which bears an impression disk or roller c^2—c^3 engaged on the opposite shaft. As shown, a gear c^4 journaled on a suitable stud shaft on the frame meshes with the gear c^{10} which meshes with the gear b^6 on the shaft b^4 of the impression roll B′ and also with a gear C⁴ on the numbering shaft C′ and said gear C⁴ meshes with a gear C⁵ on the shaft C, in consequence rotating the numbering wheels oppositely and upwardly.

Rollers D—D′ are provided below the impression rolls and others D²—D³ closely ad-

jacent each other above the impression rolls so that the strips of paper X—X′ shown in Fig. 2 may be directed around the outer side of the impression rolls in position to receive the impression from the type rolls, then inwardly and upwardly between the numbeing wheels and their impression disks. By this arrangement the first and second sheet or in other words the sheet from which the original check is formed and that from which the duplicate check is formed, travel face to face, the one receiving its numbers from one of the numbered wheels and the other receiving its corresponding number from the other numbering wheel. Said numbering wheels each comprise a spider constructed as shown, conveniently of cast metal and arranged to afford peripheral notches or recesses in which are secured the numbering devices, embracing the counting wheels and the impression disks and the mechanism closely related therewith for actuating the same. As shown, five of said notches or compartments are provided in the periphery of the spider D. As shown in Figs. 3, 4 and 5, said wheel is provided with an integral hub *d*, whereby the wheel is rigidly but removably secured upon its shaft and is cored on one face to receive the mechanism whereby the numbering or counting wheels are automatically shifted.

The numbering device proper embraces a frame or casing E, in which is journaled a shaft *e* having secured thereon the numbering or counting disks e^2—e^3, each having rigidly attached thereto a ratchet wheel e^4—e^5. Supported on the same shaft with said numbering or counting disk is a stirrup F, which as shown, depends below the numbering disks and is provided with lateral straps *f*—*f*′, through which the shaft extends. Said lateral strap *f*′ is provided in one side with a notch f^2 which opens obliquely downwardly as shown in Fig. 8. Extending through a vertical slot in the frame E is a pin f^3, the end of which projects into said notch and the outer end of said pin is rigidly engaged on a casing f^4 slidable in a complemental bore in the casing or frame E, and in which is a strong pushing spring f^5, the upper end of which bears against a suitable rigid stop f^6 on the frame and acts to hold said casing f^4 and pin f^3 normally at the lower limit of adjustment. When the casing is pressed upwardly said pin causes said stirrup to swing beneath said counting or numbering disk thereby actuating the same as hereinafter described. Said numbering disks with their ratchets are rotatable on said shaft *e* and pivotally engaged on the stirrup F, below said numbering disks is a double detent G, comprising an arm *g* adapted to engage the ratchet e^4, and an arm *g*′ which is adapted to engage the ratchet wheel e^5 after each revolution of the ratchet wheel e^4. The arm or detent *g* is directed inwardly farther than the detent arm *g*′, so that the detent arm *g*′ can only engage the ratchet wheel e^5 when the detent *g* is seated in a notch g^6 in said ratchet wheel e^4, which is deeper than the remaining notches. Said ratchets as shown, each have ten teeth to correspond with the ten digits, which are marked oppositely the same on the numbering disks, and said deepest notch is arranged to correspond in position with the naught on the unit disk e^3. Yieldingly secured also upon the frame E in position to bear against each of said ratchets is a spring detent g^3, which acts as a brake for said ratchet wheels when actuated by the detent G not only holding the same from going too far with each throw but as well holding the same to adjusted position during printing. The end of said detent being rounded, readily permits the ratchet teeth to pass the same affording slight resistance to the positive actuation thereof due to the swing of the stirrup F.

An annular back plate E′ is secured on each counting wheel after the counting mechanisms are secured in place, as shown in Fig. 5, and pivotally engaged within a recess in the face of said wheel is a lever H, which is provided at its peripheral extremity with a shaft or pin *h*, rigidly secured thereon on which is journaled a roller *h*′, as shown in Figs. 3 and 5 which project outwardly through apertures in the face of said numbering wheel. The inner end of said lever projects beneath the casing f^4, as shown in Fig. 3 and into position to lift the same when the opposite end of said lever is swung inwardly toward the center of the wheel. Secured on the face of said wheel concealing said levers excepting for the rollers *h*′ thereon which protrude therethrough, is a plate F^2. The amplitude of movement of said lever is such that the throw thereof is sufficient to swing the stirrup F upwardly to rotate the units counting or numbering disks e^4 $\frac{1}{10}$ of a revolution or in other words, to count one thereon.

Means are provided for simultaneously actuating said levers on both the sets of counting wheels, that for the original and that for the duplicate sheet. For this purpose a cam wheel I is rigidly secured on the shaft b^4 of the compression roll B′, and for half its periphery presents a raised surface. A roller *i* on the end of the horizontal lever *i*′, tracks on said cam and on the opposite extremity of said lever a connecting rod i^2 extends upwardly and pivotally engages an arm i^3 secured on a shaft I′ journaled in the frame extensions *a*. On the opposite side of the shaft is a geared segment i^4, which meshes with a corresponding geared segment i^5, on the shaft I^2, and rigidly connected with each of said shafts is a downwardly in-

clined tripper arm i^6—i^7 respectively, each of which is provided with an inclined or undercut end as shown in Fig. 2 and lies normally, when the high part of the cam is engaged, in position to engage and press the outwardly extending rollers on said levers H downwardly and thereby actuating the counter.

For elevating the tripper arms independently of the position of the cam, the pivot i^8, whereby said connecting rod i^2 is engaged on the arm i^3, is in the form of a crank i^8, that is to say, is eccentrically offset so that the portions extending through the arm i^3, is not in alinement with the portion extending through the connecting rod i^2. Rigidly secured on the head of said bolt is a pail or extension i^9 whereby said pivot bolt may be rotated in the connecting rod to elevate the arm i^3 sufficiently to throw the tripper arms i^6—i^7 out of operative position.

The operation is as follows: Two strips of paper are fed inwardly beneath the rolls D—D′ and upwardly and outwardly around the impression rolls B—B′. The sheets next pass inwardly around the rollers D^2—D^3, and upwardly between the numbering wheels and their complemental disks and from thence from the machine. The strips thus printed and numbered are assembled with other corresponding sheets of consecutively higher number to afford when stapled at intervals in the length and cut transversely a number of books each correctly paged. Inasmuch as the intermeshing gears of the impression rolls are equal in size as are also the gears c^4—C^4—C^5 the peripheral speed of the counting wheel corresponds with the peripheral speed of the impression and type rolls thereby preventing any undue stress and obviating all danger of tearing the paper. The numbering mechanisms on each counting wheel are five in number and arranged equal distances apart in the periphery of the counting wheel, the numbers are impressed upon each sheet, book lengths apart and may be set to mark or number consecutively if the numbering mechanisms are set consecutively for that purpose. Ordinarily said mechanisms may be used in constructing paged duplicate sales books such as before described. The pages for a number of books are printed in strips, all the pages 1 in one strip, a duplicate faced thereon and also paged 1, a second page original and a duplicate, each page numbered 2 and in like manner the strips are laid up to the number of pages received after which the groups of strips are stapled and cut up into separate books. When books are to be made in this way with the strips each bearing a consecutively higher page number, the counting mechanisms must mark each page on each strip with the same page number and then automatically shift to number the pages of the next strip and duplicate with a higher number. To accomplish this the counters are all adjusted at 1, and with the cam I positioned as shown in Fig. 2, each counter will mark 1, on the successive pages of the first strip for the first revolution of the counting wheel and then the cam I raising the lever in the numbering disks are shifted to 2 after printing 1 for the next revolution, thus each page on a strip ten pages long is numbered with the same page number and the numbering disks shifted to 2 by the time the low portion of the cam again reaches roller i on the lever i', and this continues automatically until the desired number of strips have been printed.

The shifting mechanism is exceedingly simple and effective. The tripper arms i^6 or i^7 when engaged by the protruding rollers h' on the levers H presses the same down thereby elevating the opposite end of said lever and carrying the casing f^4 upwardly. The pin f^3 engaging in the slot f^2 in the head of the stirrup F swings the stirrup upwardly one notch on the ratchet wheel e^4 rotating the disk e^2 and the pawl g^3 engages and holds said ratchet wheel while the stirrup swings back to normal after the lever H is released. This operation continues until the deep notch g^6 is reached by the pawl G. The longer arm g of said pawl seating therein permits the shorter blade g' to engage the ratchet wheel e^5 which rotates the tens, numbering disk e^3. The upward swing of the stirrup F now rotates both numbering disks returning the units disk to 0 and counting up one on the tens disk. This cycle of operation is continued until 99 is marked up when the next movement returns the disks to units. Of course, owing to the fact that the tripper arms i^6—i^7 for both numbering wheels are simultaneously actuated from the same cam by means of the geared segments, it follows that the shifting of the numbering disks of each set is accomplished simultaneously.

Of course, my invention may be used in connection with or independently of a printing press, and the numbering mechanisms may be used singly or may be used in groups of two or more and may, if preferred, be adjustable on their shafts, and many details of construction and arrangement may be varied without departing from the principles of this invention. I therefore do not purpose limiting this application for patent than necessitated by the prior art.

I claim as my invention:

1. In a device of the class described a plurality of hollow numbering wheels, each provided with recesses in its periphery, a numbering mechanism secured in each recess projecting slightly beyond the periphery of the wheel, levers pivoted to each numbering wheel, each lever having the inner end projecting into position to actuate one of the

numbering mechanisms, and the outer end of each lever extending outwardly from the numbering wheel, and simultaneously operating members for engaging the outer ends of the levers and actuating the same to operate the numbering mechanisms.

2. In a device of the class described a plurality of hollow numbering wheels, each provided with recesses in its periphery, a numbering mechanism secured in each recess projecting slightly beyond the periphery of the wheel, levers pivoted to each numbering wheel, each lever having the inner end projecting into position to actuate one of the numbering mechanisms, and the outer end of each lever extending outwardly from the numbering wheel, simultaneously operating members for engaging the outer ends of the levers and actuating the same to operate the numbering mechanisms, intermeshing segments for simultaneously actuating said members, means for automatically actuating said segments and means for manually actuating said segments to permanently adjust the members out of operation with said levers.

3. In a device of the class described oppositely disposed, hollow numbering wheels, an impression wheel bearing against each numbering wheel, a plurality of numbering mechanisms secured to each wheel, levers pivoted in each wheel, one for adjusting each numbering mechanism and projecting axially from the side of the wheel, tripper arms, one for operating the levers of each numbering wheel and means for automatically adjusting the tripper arms simultaneously.

4. A numbering device embracing opposed offset numbering wheels constructed to repeat each digit a plurality of times on each of two strips passed between the same, means rotatable with each numbering wheel for independently actuating said wheels to shift to a successively higher digit after each cycle of operation and mechanism for actuating said rotatable means.

5. A device of the class described embracing a rotative numbering wheel having a plurality of pockets in its periphery, a printing numbering device in each pocket comprising rotative units and tens disks having numbers on the periphery which project beyond the periphery of the numbering wheel, a lever, a casing actuated thereby, means actuated by the casing for actuating the units disk, a spring in the casing adapted to return the casing to normal, a pawl actuating the tens disk from the units disk and a cam for actuating said lever.

6. In a device of the class described means feeding a plurality of strips of paper face to face, oppositely acting printing numbering mechanisms arranged to impress the same numbers simultaneously on said strips, adjustable means whereby said numbering mechanisms are adapted to impress consecutively or to repeat each number, tripper arms, mechanisms actuated thereby to simultaneously adjust corresponding pairs of numbering mechanisms to vary the number and springs for returning said mechanisms to normal after each adjustment.

7. A machine of the class described embracing mechanisms adapted to number opposite sides of two corresponding strips to afford original and duplicate pages, each bearing the same number, each strip comprising a number of pages joined end to end, all pages bearing the page number and succeeding strips bearing successively higher page numbers and mechanism adapted for adjustment to permit said mechanisms to number said strips continuously with the same digit.

8. In a numbering mechanism a wheel provided with peripheral pockets, a numbering device secured in each pocket and a lever pivoted to the wheel adjacent each numbering device, a casing adapted to be reciprocated by the lever, means actuated by the casing adapted to adjust the numbering device to number a higher digit and a spring in the casing adapted to return the casing and said means to normal position prior to another adjustment of the numbering device.

9. In a numbering mechanism a wheel provided with peripheral pockets, numbering disks in each pocket, connected pawls for adjusting the same, a lever pivoted adjacent each pocket transversely to the radius of the wheel, adapted to actuate the pawls to adjust the disks, means for vertically oscillating the lever for actuating the pawls and a spring for each pocket adapted to return the pawls to normal.

10. In a device of the class described a numbering wheel provided with peripheral pockets, a numbering device secured in each pocket, a reciprocating member for actuating each numbering device to a higher digit, levers pivoted to the wheel, each lever having its inner end below one of the members and its outer end projecting outwardly from the wheel, mechanism for successively actuating each lever to elevate its inner end to reciprocate the appropriate member to adjust its numbering device and means for adjusting said mechanism whereby the numbering devices continuously operate to print the same number.

11. In a device of the class described a numbering wheel having peripheral pockets, numbering mechanisms in said pockets, annular plates secured to the sides of the wheel at the periphery and retaining the mechanisms in place and one of said plates affording a chamber, levers pivoted in said chamber adjacent each numbering mechanism

adapted to adjust the same, a friction roller journaled to each lever and projecting laterally outwardly beyond the plate and means adapted to engage the rollers for actuating the levers.

12. A numbering mechanism embracing rotative means for carrying the numbering devices, numbering devices each embracing disks, ratchets secured thereto, a yoke, pawls on said yoke adapted to engage the ratchets, a movable housing connected with the yoke to adjust the same, a spring in said housing automatically turning the yoke to normal after each actuation, and mechanism for actuating the housing of each numbering device for adjusting another digit to numbering position.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

SIVERT MOE.

Witnesses:
C. W. HIUS,
K. E. HANNAH.