

(No Model.)

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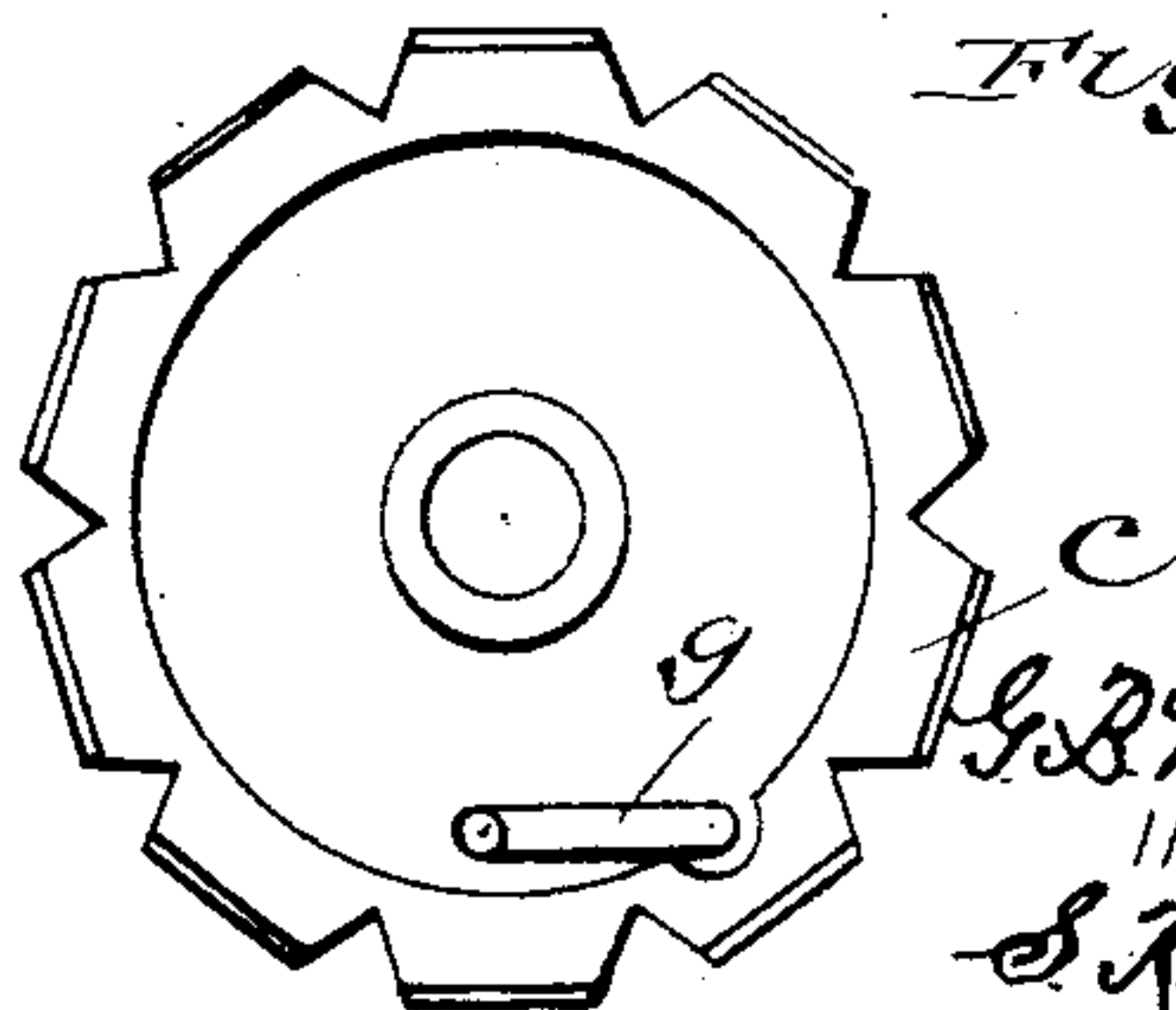
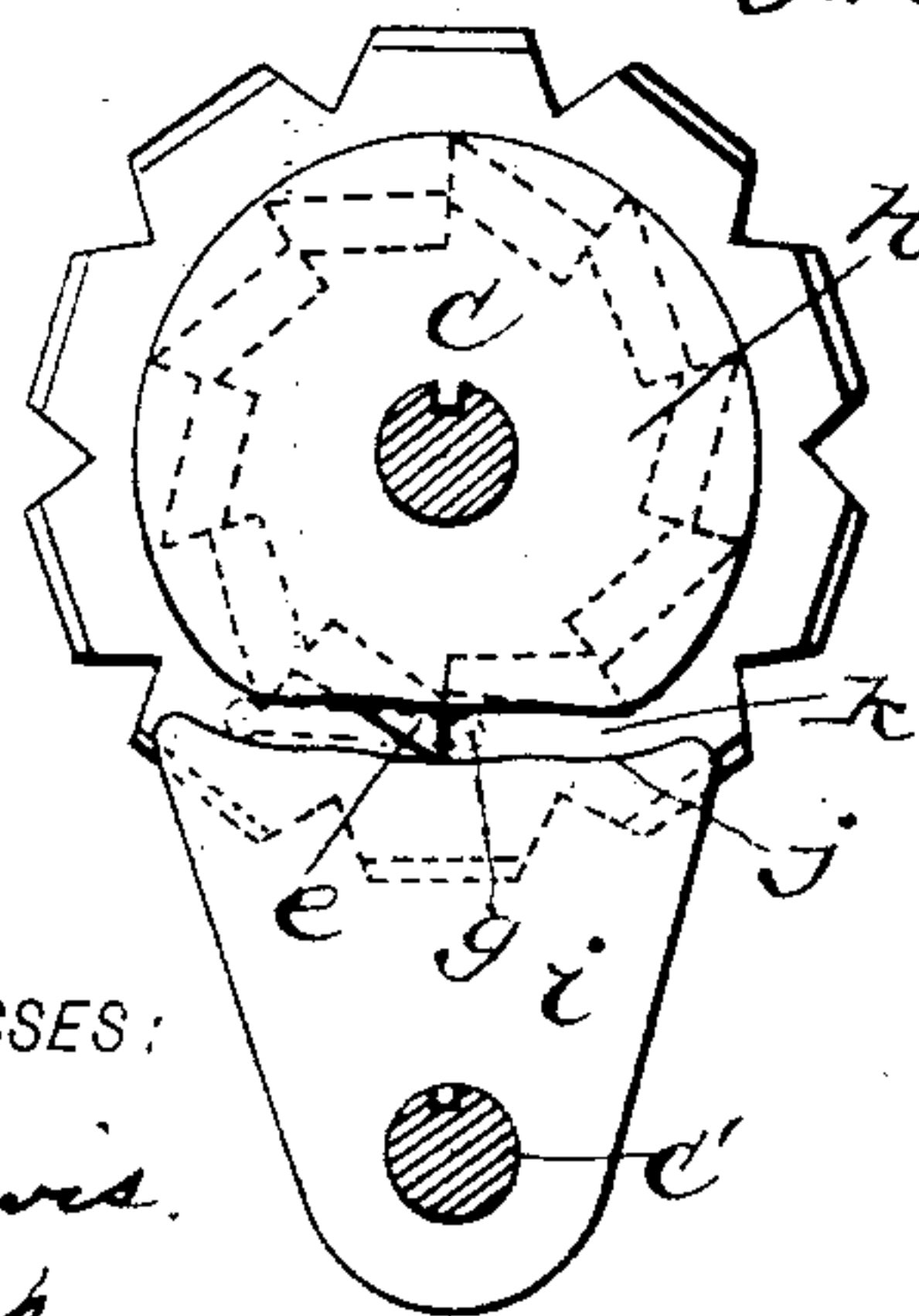
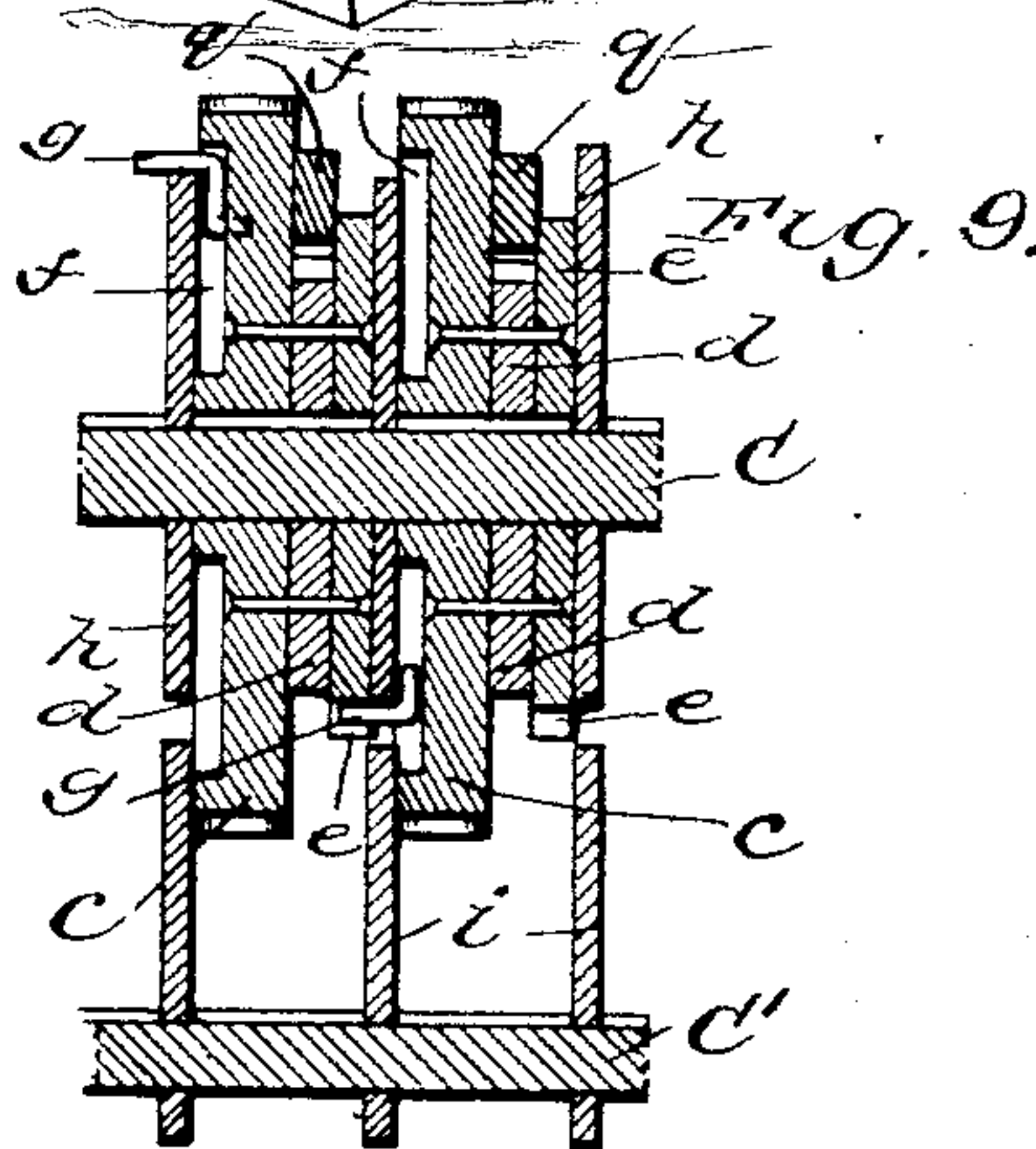
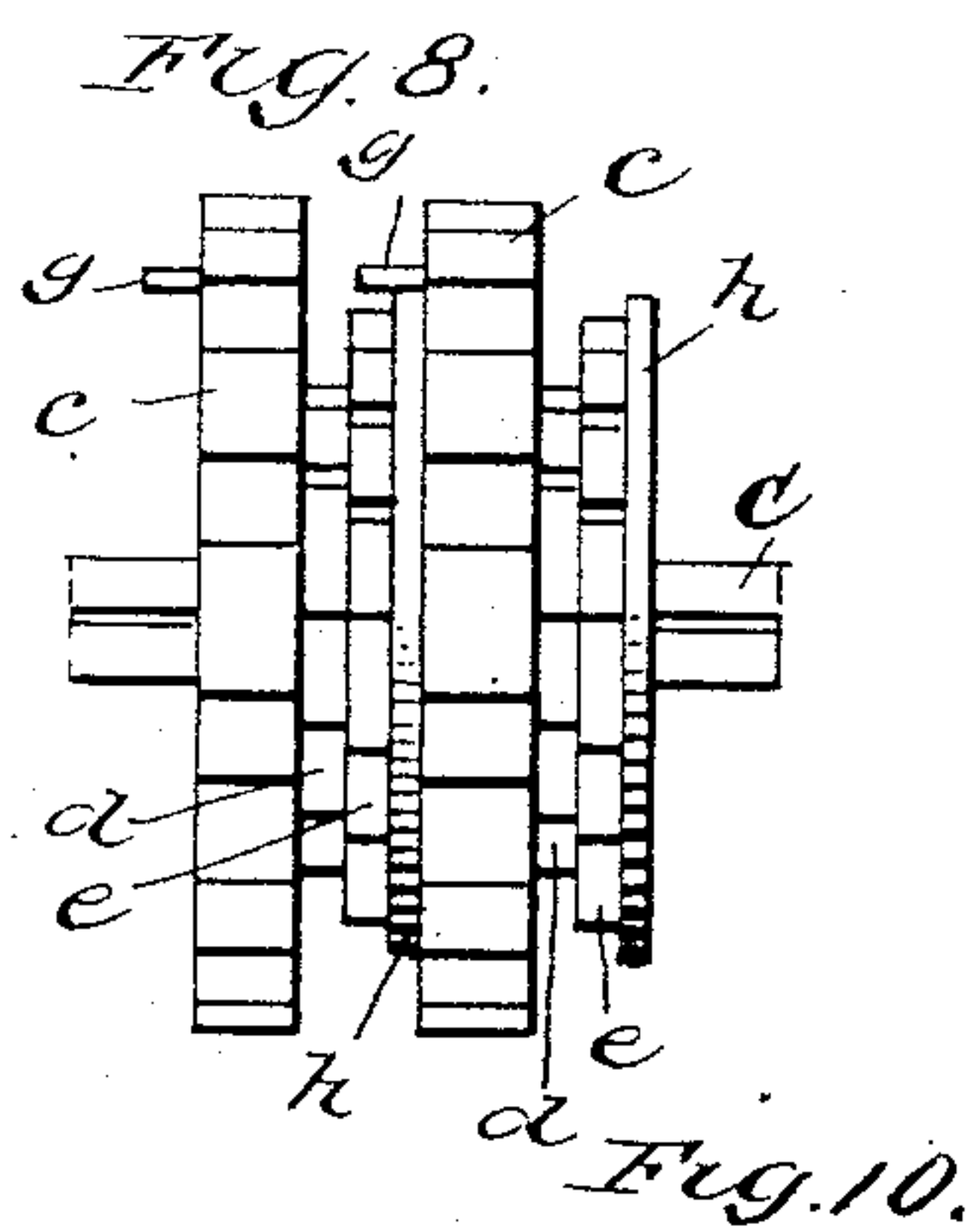
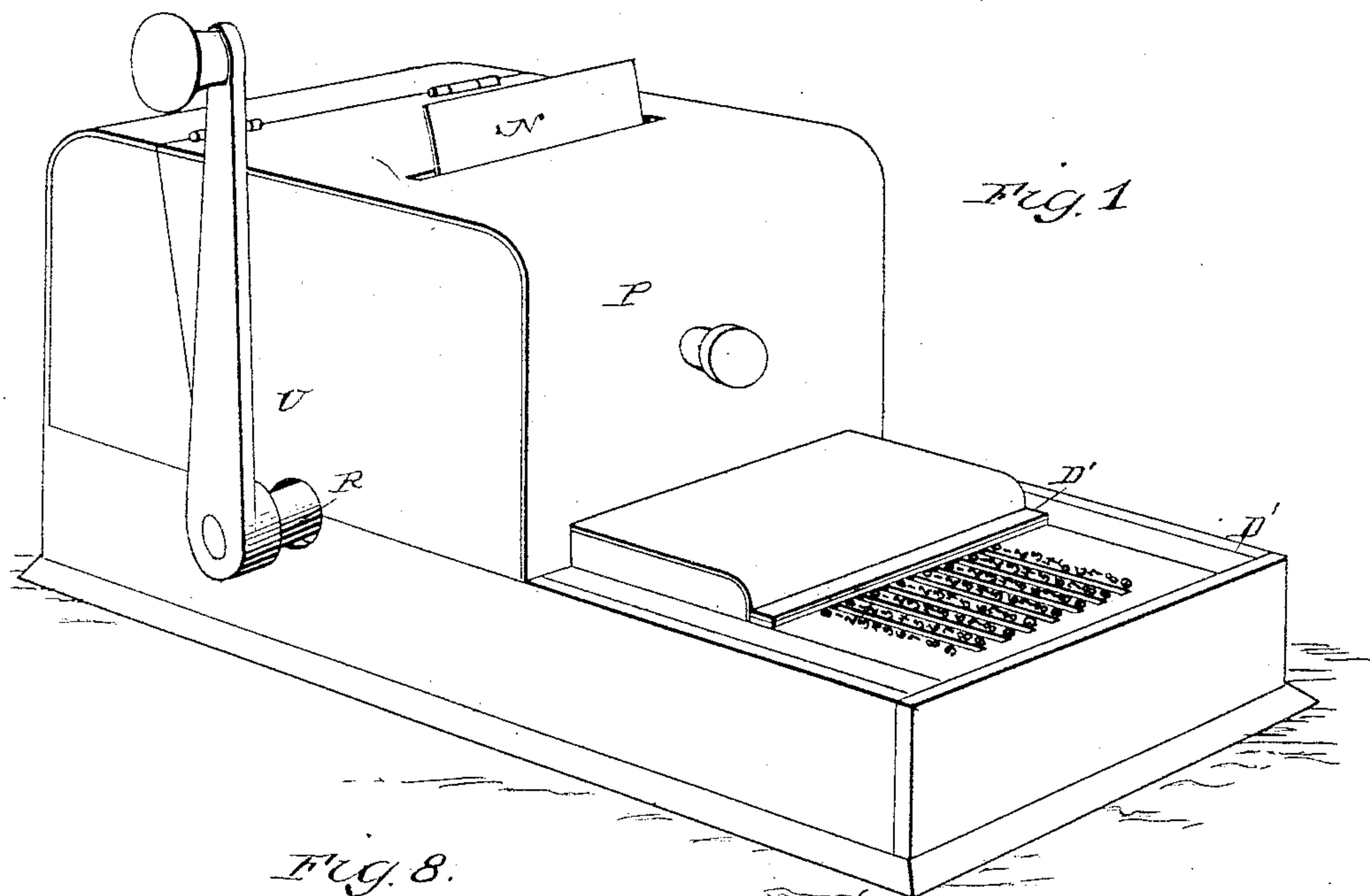
G. B. MASSEY, Dec'd.

S. R. MASSEY & S. A. BRYANT, Administrators.

APPARATUS FOR PRINTING AND ADDING NUMBERS.

No. 446,261.

Patented Feb. 10, 1891.



WITNESSES:

W. R. Davis
C. Sedgwick

INVENTOR:

G. B. Massey, deceased
S. R. Massey
BY *S. A. Bryant, Admins*
Munn & Co

ATTORNEYS

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5 Sheets—Sheet 2.

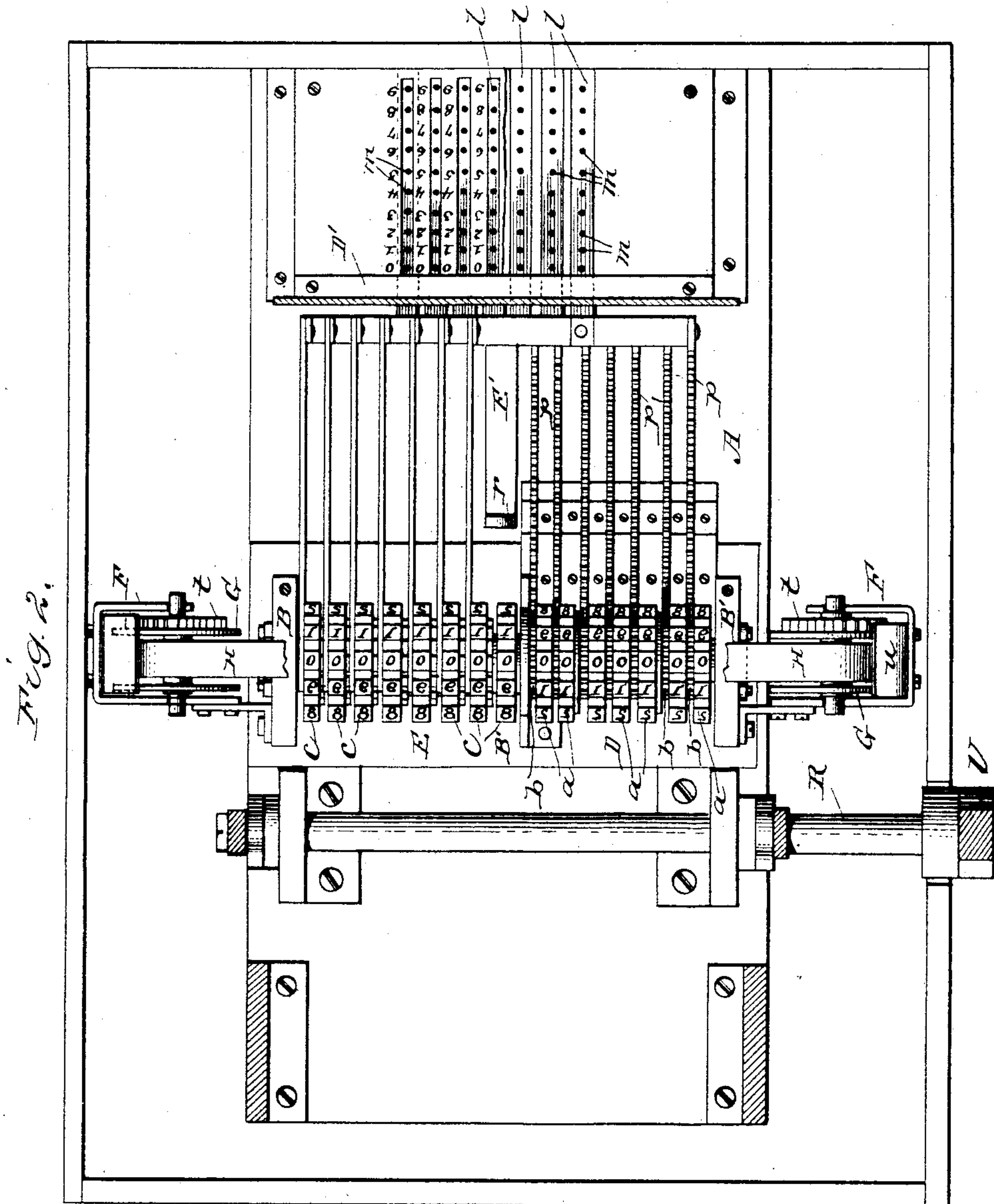
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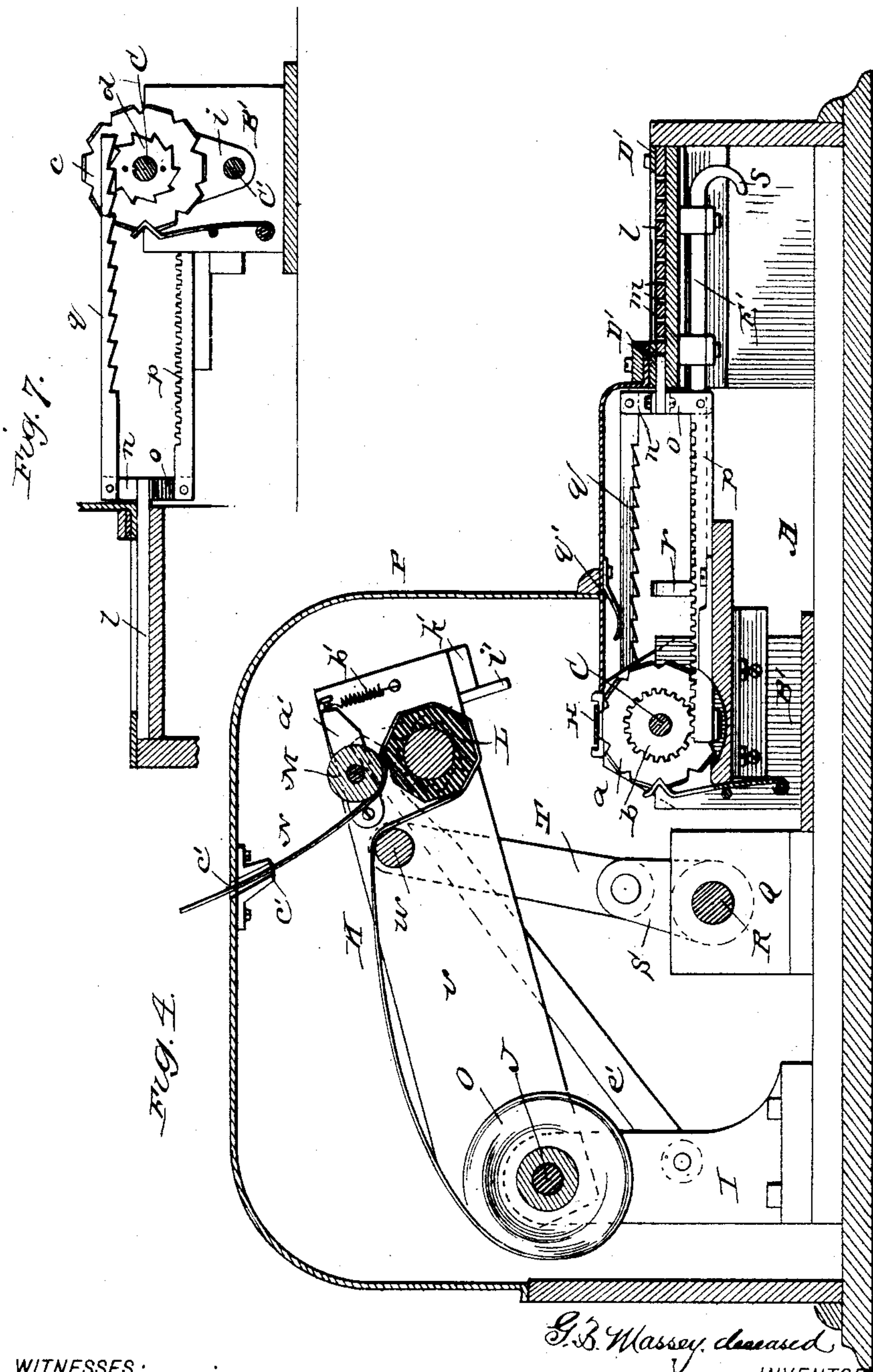
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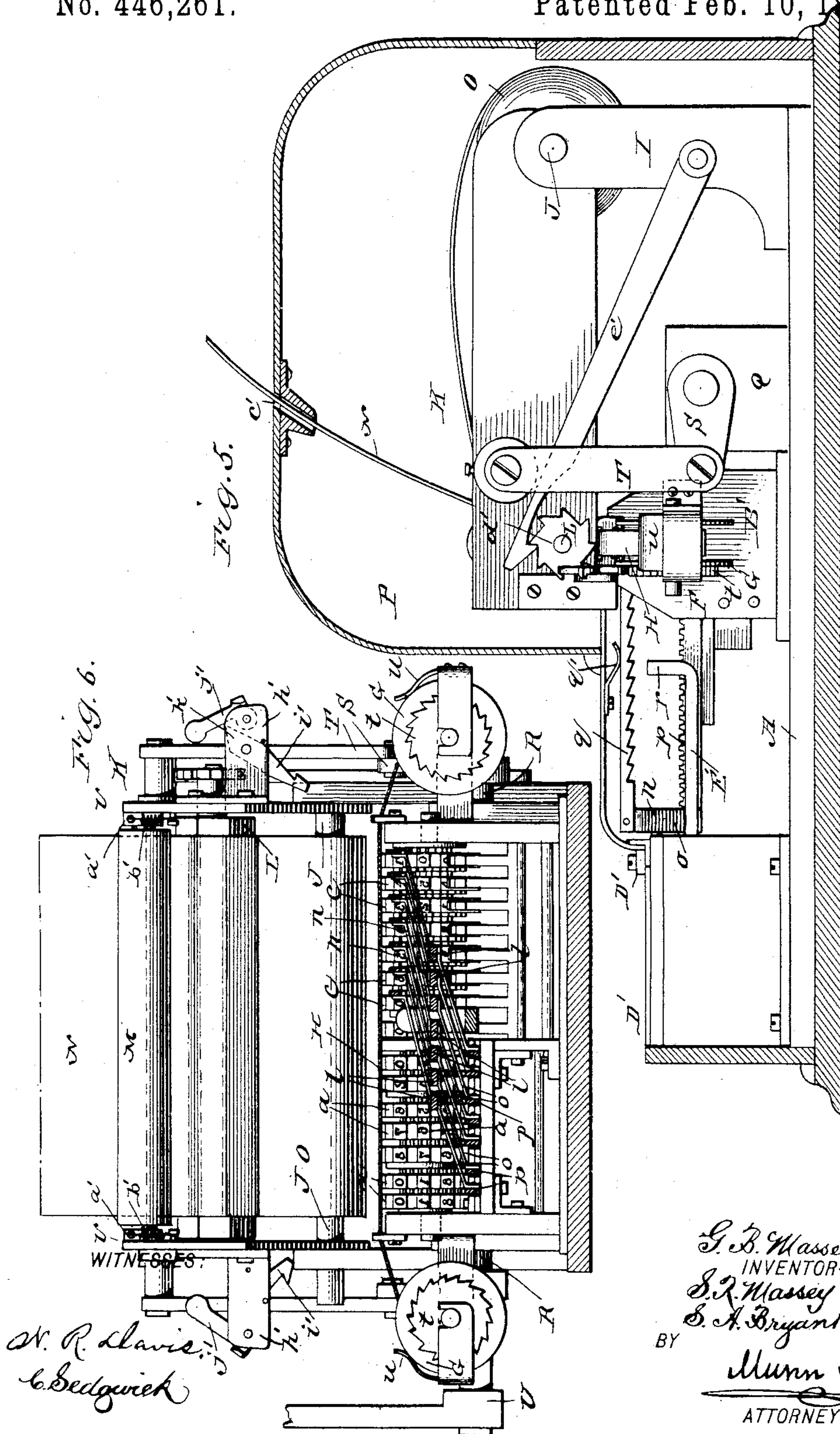
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UNITED STATES PATENT OFFICE.

SARAH R. MASSEY AND STANLEY A. BRYANT, OF MAMARONECK, NEW YORK,
ADMINISTRATORS OF THE ESTATE OF G. B. MASSEY, DECEASED.

APPARATUS FOR PRINTING AND ADDING NUMBERS.

SPECIFICATION forming part of Letters Patent No. 446,261, dated February 10, 1891.

Application filed April 16, 1890. Serial No. 348,222. (No model.)

To all whom it may concern:

Be it known that we, SARAH R. MASSEY and STANLEY A. BRYANT, both of Mamaroneck, in the county of Westchester and State of New York, administrators of the estate of GIDEON B. MASSEY, deceased, who did in his lifetime invent a new and Improved Total-Adding Machine, do declare the following to be a full, clear, and exact specification of the same, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a perspective view of the improved total-adding machine. Fig. 2 is a plan view partly in section. Fig. 3 is a side elevation, partly in section. Fig. 4 is a longitudinal section taken through the printing mechanism. Fig. 5 is a side elevation, partly in section, showing the reverse of Fig. 3. Fig. 6 is a front elevation partly in section. Fig. 7 is a detail view, partly in section, of the figure-wheel-operating mechanism. Figs. 8, 9, 10, and 11 are detail views of the figure-wheels and carrying mechanism, and Fig. 12 represents a portion of a record-strip.

Similar letters of reference indicate corresponding parts in all the views.

The object of the invention is to construct a machine for securing the grand total of a series of large sums in such a manner that the total and the sum added may be recorded every time an addition is made.

The invention consists in two series of number-wheels arranged to be operated simultaneously by means of slides furnished with numbers corresponding to those upon the wheel, one of the series of number-wheels representing the sums to be added and the other series representing the totals, the latter series being provided with "carrying" mechanism.

It also consists in mechanism for imparting motion to the carrying-wheels always in the same direction and for returning the other wheels after each operation to zero.

The invention also further consists in a novel printing mechanism and paper-feeding mechanism, all as will be hereinafter more fully described.

To the base-plate A are secured standards B B', which support a rod C, upon which are placed two series of number-wheels D E. The

series D is formed of number-wheels *a*, each of which is provided with a spur-wheel *b*, attached thereto. Each wheel *a* carries on its periphery type representing numbers ranging from 1 to 9 and a cipher. The series E is formed of wheels *c*, which are like those already described; but in lieu of being provided with spur-wheels they are furnished with ratchet-wheels *d* and carrying-wheels *e*. The wheels of the series D E are made to register by means of V-shaped springs entering notches in the peripheries of the wheels in the usual way. In the faces of the wheels *c*, opposite those to which the ratchet-wheels are attached, is formed an annular recess *f*, and in the wheel at one side of the recess is pivoted a crank-wire *g*, which extends forward beyond the outside periphery of the carrying-wheel *e* of the adjacent number-wheel.

Between the several number-wheels are placed the cams *h*, which are held in position upon the rod C by splines extending into a groove in the rod. The cams *h* are circular in form, except at the point of carrying, where they are flattened, as shown in Fig. 10, and to a rod C', which is supported below the series of carrying-wheels, are attached plates *i*, each having a curved edge *j*, corresponding in form to the flat edge of the cam *h*. The plates *i* are held in place upon the rod C' by splines entering a groove in the rod. The plates *i* and the cams *h* form a groove *k*, which receives the projecting end of the crank-wire *g*, and brings it into engagement with one tooth of the ratchet-wheel *e* once during each revolution, so that whenever the crank-wire passes through the slot *k* it carries forward the adjacent number-wheel one space. In the last wheel *c* of the series E the crank-wire is omitted.

In front of the two series of number-wheels is arranged a table D', provided with grooves for receiving the bars *l*, which are furnished with holes *m*, corresponding in number with the number of figures upon each wheel. Upon the inner end of each bar *l* are attached arms *n* o. These arms are diagonally arranged, and the arms *o* carry racks *p*, which extend underneath and engage the spur-wheel *b* of the number-wheels *a*. The arms *n* carry

ratchet-racks q , which extend over the ratchet-wheels d , and engage the said ratchet-wheels whenever the bars l are pushed forward, but are disengaged from the said ratchet-wheels 5 when the bars l are drawn backward. The said ratchet-racks q are pressed into engagement with their respective ratchets by springs q' , attached to the casing of the machine.

In guides underneath the table D' is arranged a bar E' , having an upwardly-projecting finger r at its inner end and a downwardly-projecting hook s at its outer end. The finger r is capable of engaging the arms $n o$, so as to return all of the bars l to the 15 point of starting after they have been moved forward in the operation of adding.

To the standards $B B'$ are secured frames F , in each of which is journaled a bobbin G , which carries the ink-ribbon H . To each of 20 the bobbins G is attached a ratchet-wheel t , and the said ratchet-wheels are oppositely arranged with respect to each other. In the frames F are mounted the springs u , which press upon the bobbins G , and prevent them 25 from turning independently of the ribbon-feeding mechanism, presently to be described.

In standards I , attached to the base-plate A , is journaled a shaft J , which carries the frame K , formed of the side bars v and the 30 cross-bar w , connecting the said side bars. In the frame K is journaled an octagonal impression-roller L , and to the side bars v are pivoted levers a' , in which is journaled a roller M , which is made to bear upon the paper strip N , passing around the impression-roller L , by spiral springs b' , connected with 35 the free ends of the levers a' , attached to the side bars v . The paper strip N , upon which the impressions are made, is drawn from a roll O placed on the shaft J , and after passing 40 over the rod w , the impression-roller L , and under the roller M it passes out through a slot c' in the top of the casing P .

To the base-plate A are attached standards 45 Q , in which is journaled a rock-shaft R , provided with arms S , located outside of the standard Q . The arms S are connected by links T with the ends of the rod w , which is prolonged beyond the sides of the frame K for that purpose. The shaft R extends through 50 the casing P , and is provided at one end with a lever U , by which the shaft R is turned. The shaft of the roller L is prolonged beyond the frame K , and furnished with a ratchet-wheel d' , which is engaged by a hooked pawl 55 e' , which is pivoted to one of the standards I . In the other standard I is inserted a stud f' , which forms an abutment for the spring g' , extending over the projecting end 60 of the shaft J and under one end of the rod w , the said spring being arranged to lift the frame K after the printing is done. To ears h' , projecting from opposite sides of the frame K , are pivoted pawls i' , which are adapted to 65 engage the ratchet-wheels t . The pawls i'

are oppositely arranged with respect to each other, so that they can be thrown into engagement with their respective wheels. To the ears h' are also pivoted the weighted levers 70 j' , which engage the shoulders k' of the pawls i' and hold the said pawls out of engagement with their ratchet-wheels when they are not required for use. When it is desired to bring 75 one of the pawls into engagement with its ratchet, the weighted lever j' is swung outwardly, thereby releasing the pawl, allowing it to act by gravity.

The operation of the improved total-adding machine is as follows: The adding is carried 80 on by moving the right-hand bar l , representing units, forward by means of a suitable point or rod inserted in one of the apertures m in the said bar opposite the figure to be registered. This results in carrying the first 85 wheel a of the series D forward as many notches as there are units to be added. It also carries forward the first wheel c of the series E in the same manner and at the same time. The tens-column is proceeded with in 90 the same manner, and so on with as many of the bars l as are necessary to represent the sum to be added. The wheels of the series D move forward from zero, while the wheels 95 of the series E move forward from the figure or figures last registered. When the sum has been registered in the manner described, the lever U is moved over toward the front of the machine, thus carrying the impression-roller L downward into contact with the ribbon 100 H , pressing the ribbon down upon the wheels $c a$, producing an impression upon the paper of the sum to be added from the series D and of the total of the sums added from the series E , thus, as the adding proceeds, 105 producing two columns, one representing the sum added, the other the sum total of all of the sums added, as shown in Fig. 12. When the printing is done, the lever U being released the spring g' raises the frame K , thus 110 turning one of the ink-ribbon bobbins one notch, then turning the impression-roller L one notch by the engagement of the pawl e' with the ratchet-wheel d' as the frame K rises. All the bars l are returned to zero by drawing 115 out the bar E' . This operation returns the wheels of the series D to zero, but leaves the wheels of the series E in the position in which they were placed. Every revolution of the first wheel of the series E carries forward the 120 second wheel of the series one notch through the medium of the carrying mechanism already described, and every revolution of the second wheel carries forward the third wheel one notch, and so on throughout the series. It will thus be seen that any sum within the 125 capacity of the machine may be recorded by the series E upon the paper strip N , and these figures may be read as the said strip passes out through the top of the casing.

Having thus described the invention, we 130

claim as new and desire to secure by Letters Patent—

1. In a total-adding machine, the combination of two series of number-wheels, one series being provided with carrying mechanism, spur-wheels attached to one series, ratchet-wheels applied to the other series, series of rack-bars constructed to engage the spur-wheels, series of ratchet-bars constructed to engage the ratchet-wheels, and perforated sliding bars connected with the rack and ratchet-bars, substantially as specified.

2. The combination, with the rack and ratchet bars and the perforated sliding bars, of an auxiliary sliding bar provided with a finger for returning all of the bars and one series of the wheels to zero, substantially as specified.

3. The combination, in a total-adding machine, of a series of index number-wheels, a series of totalizing number-wheels mounted independently of the index-wheels, and operating-slides having each one member engaging an index-wheel and the other member engaging a totalizing-wheel, substantially as described.

4. The combination, in a total-adding machine, of a series of total-adding wheels having normally a forward movement only, a second series of adding-wheels having a return movement after each forward movement, and a printing mechanism for both of said series, substantially as described.

5. In a total-adding machine, the combination of two series of figure-wheels arranged to rotate in opposite directions, one series being returnable by rack-and-pinion mechanism, the other series being constructed for forward motion only, carrying mechanism attached to the forwardly-moving series of wheels, and registering-springs for causing the figure-wheels to register and for preventing the accidental turning of the same, substantially as specified.

SARAH R. MASSEY,
STANLEY A. BRYANT,

*Administrators of the estate of Gideon B.
Massey, deceased.*

Witnesses:

ARTHUR T. HOFFMAN,
LAURA A. BRYANT.