

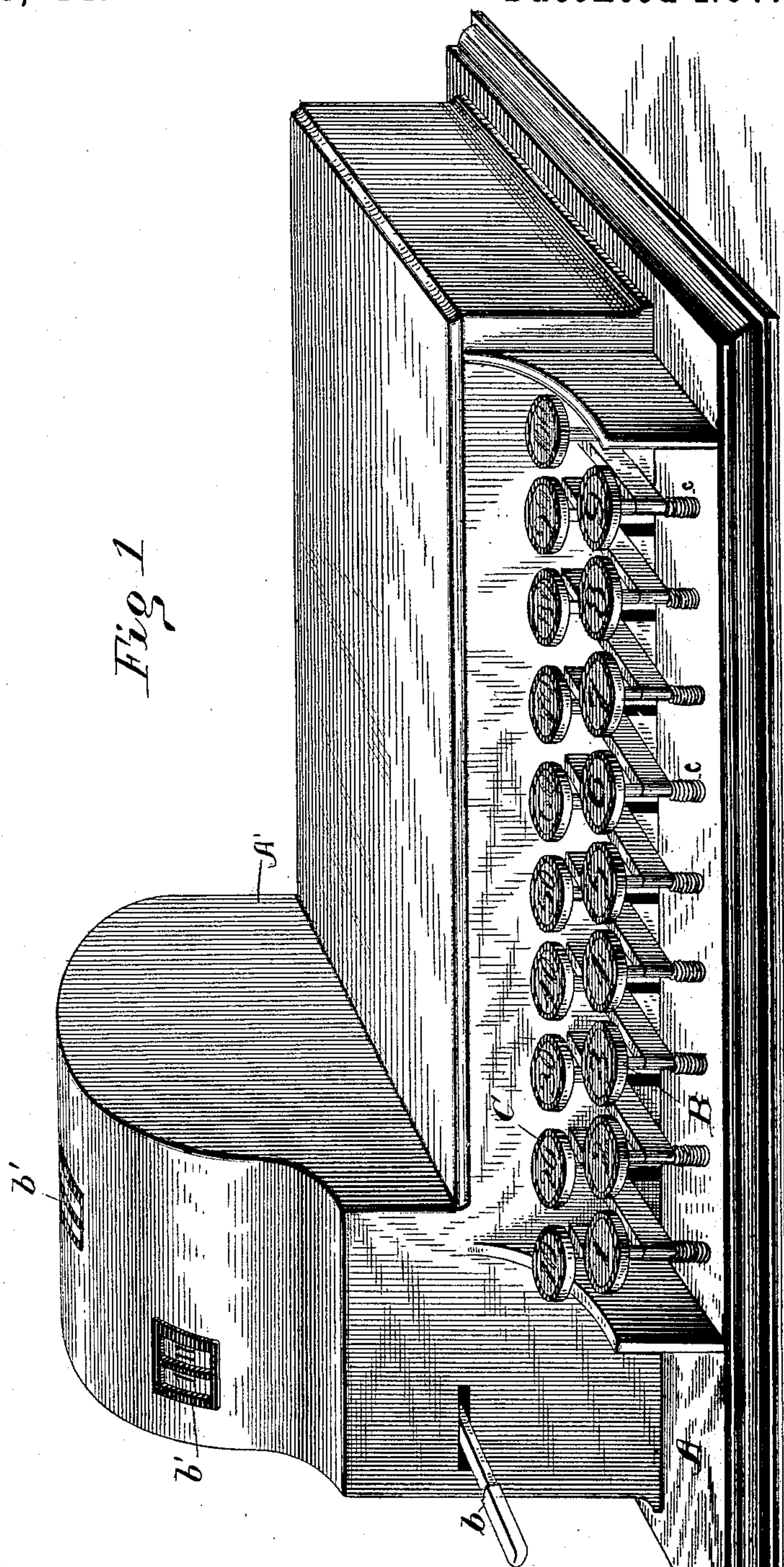
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3 Sheets—Sheet 1.

C. A. OAKES & J. H. JACKSON.  
ADDING MACHINE.

No. 485,214.

Patented Nov. 1, 1892.



Witnesses  
*C. C. Burdick*  
*Wm. C. Cudde*

Inventors  
*John H. Jackson*  
*Chandler A. Oakes*  
per  
*Wm. C. Cudde*  
Attorneys

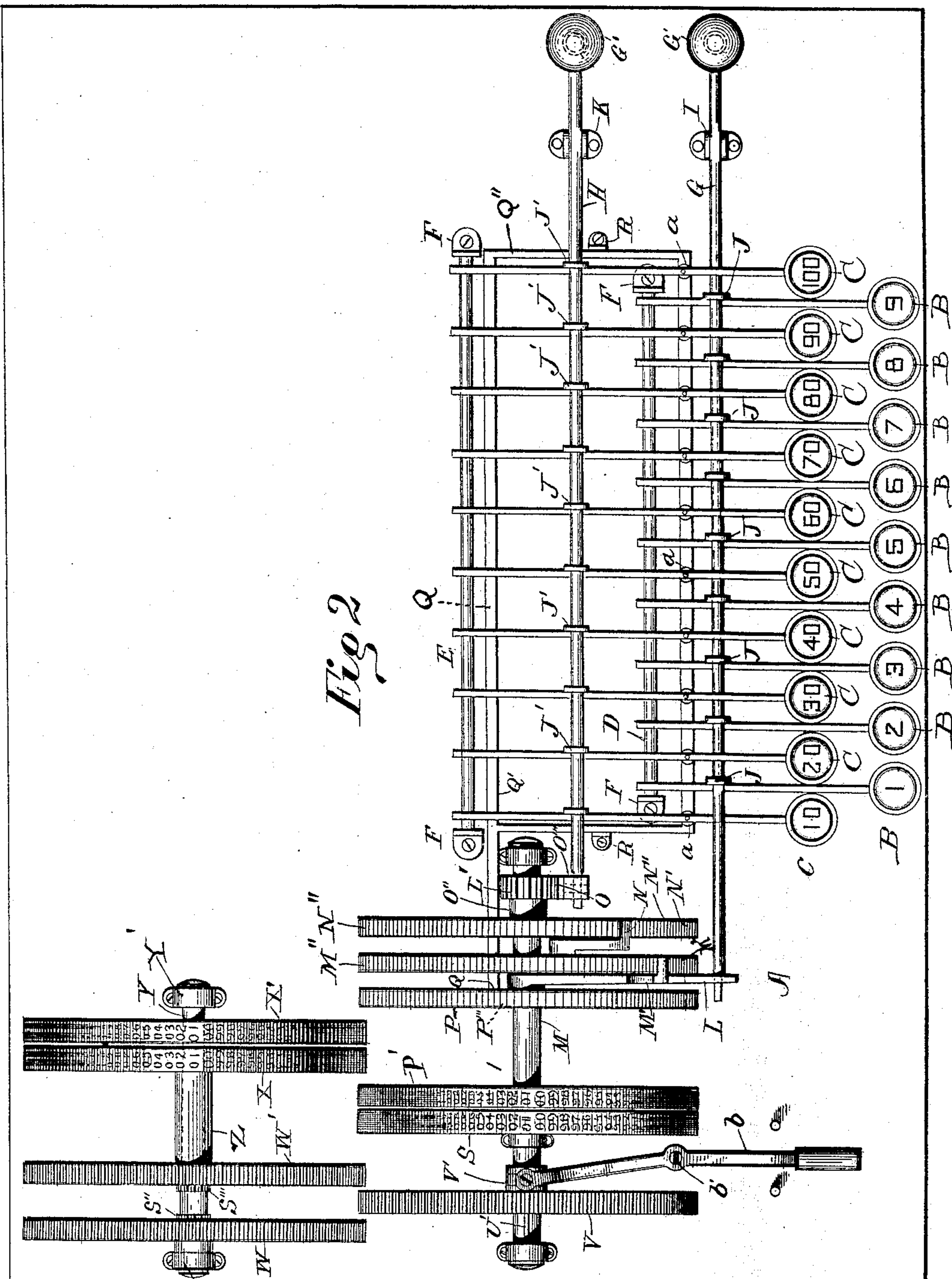
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WITNESSES:

C. C. Burdine  
W. Hume Clendenin

INVENTORS.  
John H. Jackson and  
Charles A. Oakes  
BY  
S. J. [Signature]  
ATTORNEYS



(No Model.)

3 Sheets—Sheet 3.

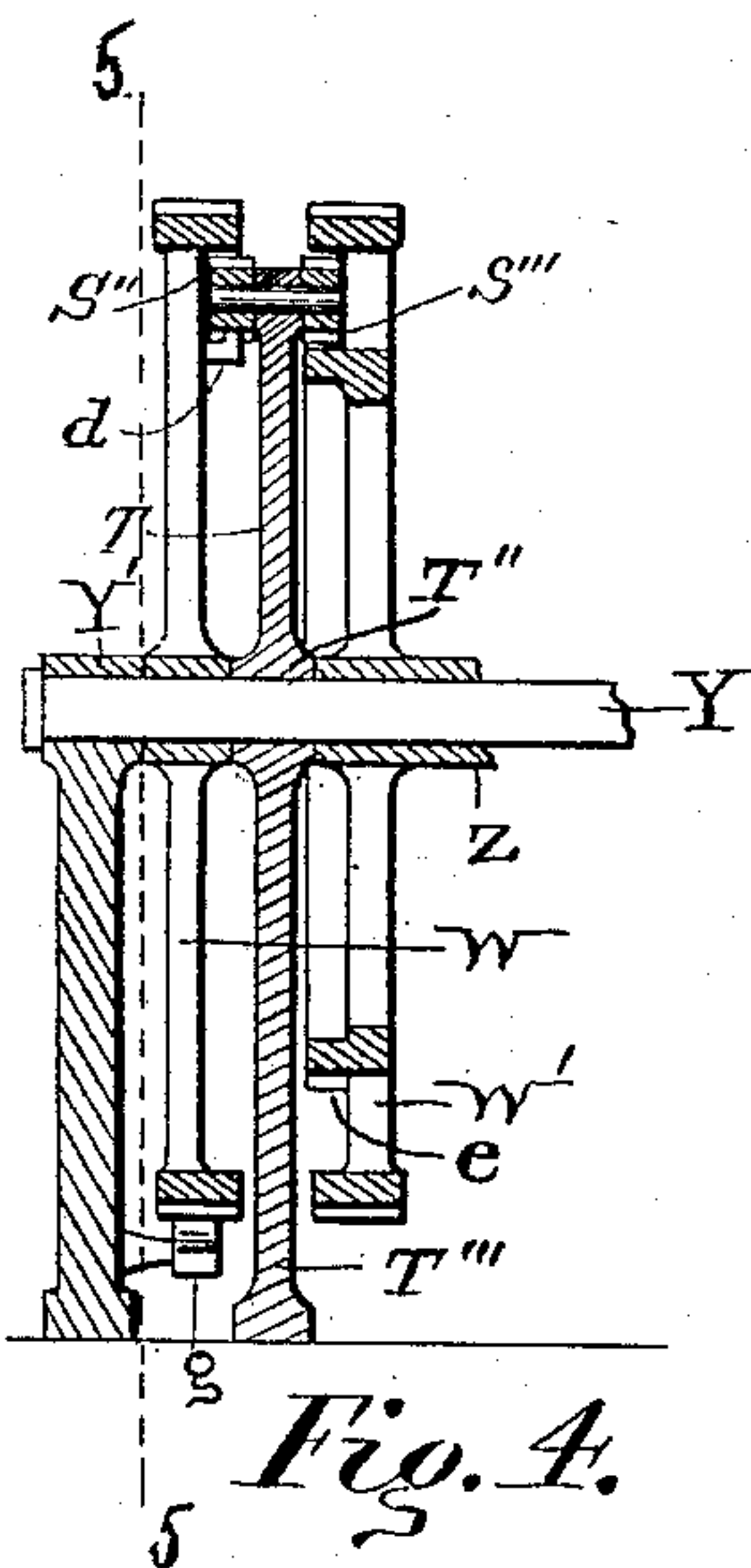
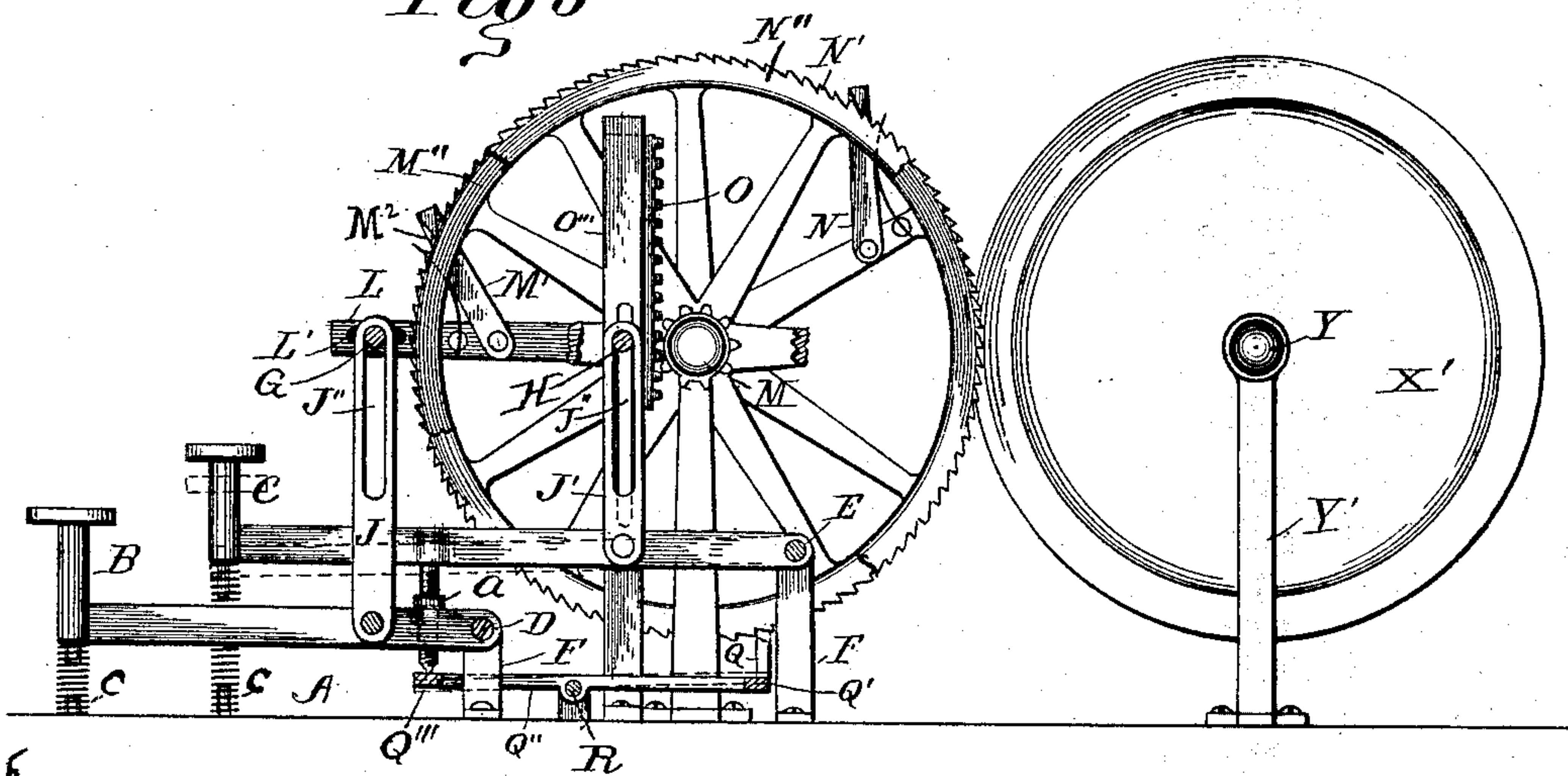
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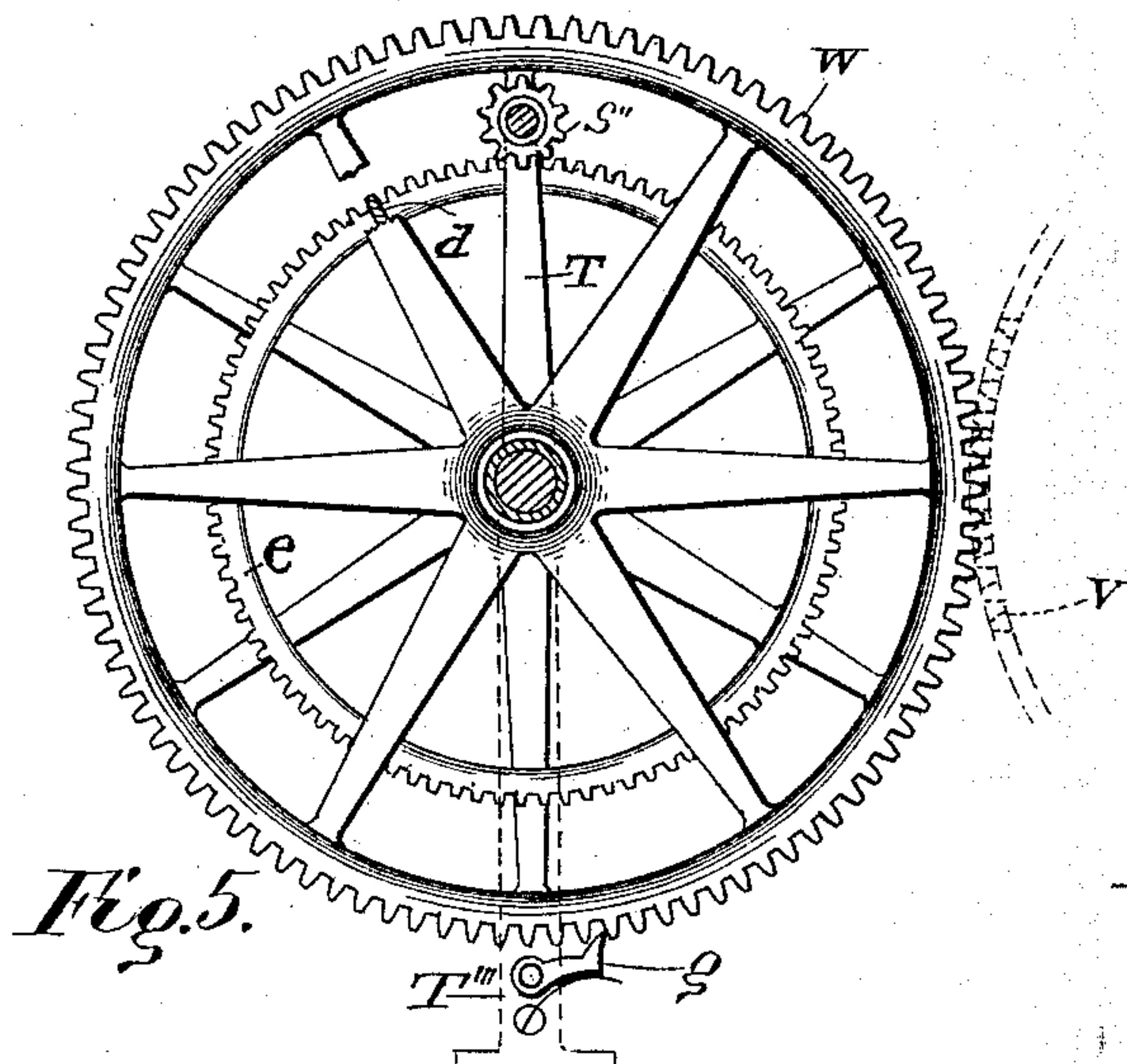
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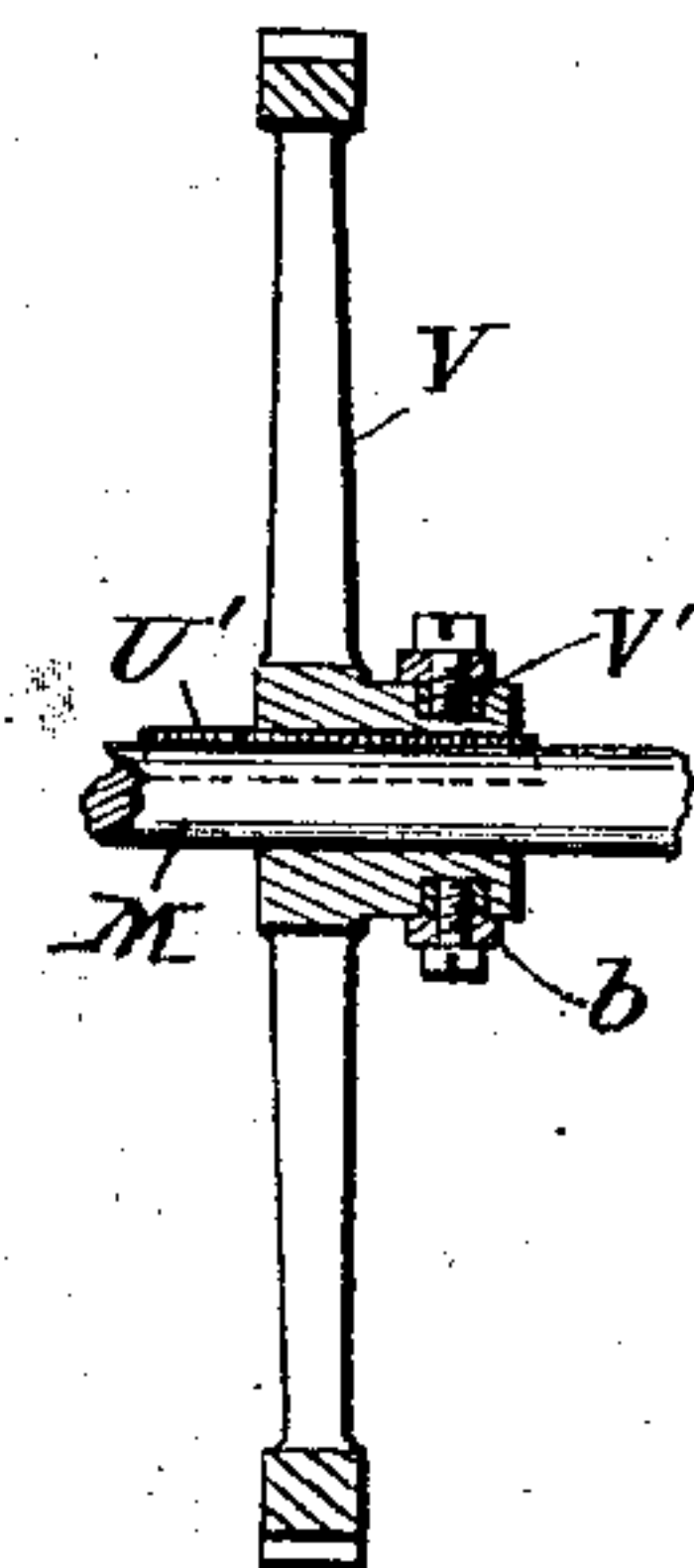
*Fig 3*



*Fig. 4.*

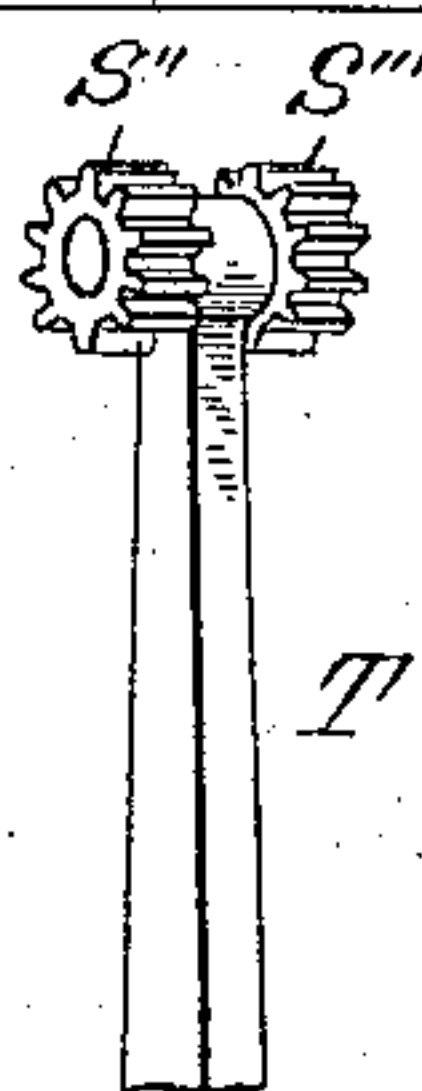


*Fig. 5.*



*Fig 6*

*Fig. 7.*



WITNESSES:

*C. C. Burdick*  
*Wm. C. C. Burdick*

INVENTORS.

*John H. Jackson*  
*Charles A. Oakes*  
BY  
*DeBorja & Son*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

CHANDLER A. OAKES, OF NEW YORK, N. Y., AND JOHN H. JACKSON, OF  
PEN ARGYL, PENNSYLVANIA.

## ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 485,214, dated November 1, 1892.

Application filed December 16, 1891. Serial No. 415,295. (No model.)

*To all whom it may concern:*

Be it known that we, CHANDLER A. OAKES, residing at New York, in the county and State of New York, and JOHN H. JACKSON, residing at Pen Argyl, in the county of Northampton and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Adding-Machines; and we do 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, reference being had to the accompanying drawings, and to the letters marked thereon, which form a part of this specification.

Our invention relates to that class of adding-machines in which several numbered disks are actuated by a set of keys bearing numbers.

The purpose of our invention is to provide a device which will be more simple, practical, and desirable for store service than those heretofore in use; and to this end our invention consists in the peculiar features and combinations of parts more fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents an exterior perspective view of our device. Fig. 2 represents a top view or plan, the casing being removed; Fig. 3, a side elevation; Fig. 4, a detail transverse section through the cog-wheels for actuating the numbered disks bearing the highest numbers; Fig. 5, a section through 5 5 of Fig. 4; Fig. 6, a vertical detail section through one of the gears, and Fig. 7 a detail view of the fixed arm for carrying the pinions forming a part of the registering-wheels.

On a base A is mounted a row of key-levers B, numbering from "1" to "9," inclusive, representing units, and a second set of key-levers C, numbering from "10" to "100," representing tens. The units-levers are fulcrumed on a horizontal fixed shaft D and the tens-levers on a parallel shaft E, both shafts being mounted in vertical standards F.

Extending transversely over the key-levers B C and parallel with shafts D E are two long wheel-actuating levers G and H, fulcrumed, respectively, on standards I and K, located

on the right of the keys. Each of the long arms of these levers are normally held up by means of a weight G', attached to their short arms, as more clearly seen in Fig. 1.

All of the key-levers are of the second class and are connected to the long levers G H by vertical links J. These links have their lower ends pin joined to the key-levers and their upper ends are provided with oblong slots J'', through which the wheel-actuating levers G and H extend. Similar connecting-links J' are employed to connect the tens keys C. The free end of the long arm of the wheel-actuating lever G is connected to a ratchet-arm L by passing through an oblong slot L' therein, and the ratchet-arm L is loosely pivoted on the wheel-shaft M and carries a pawl M', which pawl engages ratchet-teeth M<sup>2</sup> on wheel M'', fixed to the shaft M. The wheel M'' in turn carries a loose pawl N, pivoted to one of its spokes and placed to engage the ratchet-teeth N' on the ratchet-wheel N''. The latter wheel N'' is actuated by the long lever H, the end of which is connected to a vertically-reciprocating rack O, moving in standard O''. This rack in turn engages a pinion L' on a sleeve O'', cast integral with the ratchet-wheel N'', revolving loosely on shaft M.

Adjoining the ratchet-wheel M'' and centered on shaft M is a stop-wheel P, fixed on the shaft M so as to revolve with the numbered units-wheel P'. This stop-wheel is provided with ratchet-teeth P'', which are engaged by a pawl Q on a bar Q' on the end of a rock-frame Q''. The frame Q'' is pivoted on a pivot R, located below the keys. The broad pawl Q on the bar Q', Fig. 3, is beveled to enter the notches between the ratchet-teeth of wheels M'' and N'' to lock the ratchet-wheels and prevent them from moving farther than necessary, and it is timed to commence entering a notch at the beginning of the termination of the stroke upon any one of the tens-keys, and by the time the stroke is completed the pawl will go all the way into the notch and lock the wheel against further movement, as represented by dotted lines in Fig. 3. The pawl Q can be nicely adjusted to perform this function by means of set-screws  $\alpha$ , with which each key C is provided,



as seen in Figs. 2 and 3, and which extends down therefrom to the top of the front bar  $Q'''$  of the frame  $Q$ , whereby the latter is actuated whenever one of the keys  $C$  is depressed.

5 Adjoining the numbered units-wheel  $P'$  on the left is a dollars-wheel  $S$ , which is actuated by internal mechanism like that described further on, in connection with a duplicate pair of numbered wheels for higher numbers.

10 On the left of the dollars-wheel  $S$  and secured by a feather-key  $U'$  to rotate with the shaft  $M$  is placed a gear  $V$ , which has a limited lateral movement on said shaft. This gear is to be alternately thrown in and out  
15 of engagement by lever  $b$  with a pair of gear-wheels  $W W'$ , which actuate a numbered dollars-wheel  $X$  and a numbered wheel  $X'$ , representing hundreds of dollars. The gear-wheel  $W$  and numbered wheel  $X'$  are both  
20 fixed on a counter-shaft  $Y$ , Fig. 2, and revolve together, and the intermediate gear  $W'$  and numbered wheel  $X$  are both connected to revolve together by a sleeve  $Z$ , fitting loosely on shaft  $Y$ .

25 The gear-wheel  $W$  actuates the adjoining gear-wheel  $W'$  on the right by means of a pair of pinions  $S''$  and  $S'''$ , fixed on a shaft  $S'$ , the latter being carried in the upper end of a fixed vertical arm  $T$  on a sleeve  $T''$ , which  
30 sleeve in turn is fixed on post  $T'''$  and forms a bearing for the counter-shaft  $Y$ . Both pinions  $S'' S'''$  have ten teeth. The pinion  $S''$  is engaged by a single tooth  $d$  on wheel  $W$ , and pinion  $S'''$  by an annular gear  $e$ , which  
35 contains one hundred teeth, or ten times the number of teeth on the pinions. Hence it will be seen that the left-hand gear  $W$  is required to make one hundred revolutions and revolve the pinions ten times in order to revolve the  
40 right-hand gear  $W'$  one revolution. The gear  $W$  rotates with the dollars-wheel  $X'$  and the gear  $W'$  with the hundred-dollar wheel  $X$ , and any movement imparted to either of the gears actuates their respective numbered  
45 wheels. In other words, when gear  $W$  makes one complete revolution the tooth  $d$  will engage the pinion  $S''$  and move it one-tenth its revolution, and, being fixed on the shaft  $Y$ , it revolves the other gear  $S'''$  and moves the  
50 gear  $W'$  and its numbered wheel  $X'$  one one-hundredth of a revolution, while the gear  $X$  makes a complete revolution.

The means for throwing the gear-wheel  $V$  to the right or left for the purpose of engaging and disengaging the gear-wheels  $W$  and  
55  $W'$  consists of a lever  $b$ , pivoted on a post  $b'$  in the casing  $A'$ , which covers the principal part of the mechanism. The inner end of this lever is provided with a forked end embracing a loose collar  $V'$ , so that the wheel  $V$  will be allowed to revolve freely.

Each of the four numbered wheels  $P' S X X'$  bear numbers from "0" to "99," inclusive, as in wheels common to this class of devices.  
65 Each of the keys is provided with a retracting-spring  $c$ , which is used to force them back to their proper position when depressed. To

prevent the secondary wheels  $X X'$  from moving too far by their own inertia, a brake  $g$  is provided, which brake enters notches  $g'$  on  
70 the side of the gear  $W$ .

The preferred construction of our device having been set forth, we will now proceed to describe its operation.

Assuming that the numbered wheels are all  
75 set at "0"—the starting-point—and it is desired to indicate a certain sum of money, consisting of several different amounts, such as twelve cents, twenty cents, and ninety cents, the total of these amounts can be quickly in-  
80 dicated by depressing the key numbered "10," then the key numbered "2," then the one marked "20," and finally the one marked "90," whereupon the total amount will be indicated and brought before the sight-hole. When the  
85 key numbered "10" is depressed, its downward movement lowers the bar  $H$  and rack  $O$ , thereby actuating pinion  $L'$  and ratchet-wheel  $N''$ . The wheel  $N''$  carries with it the adjoining wheel  $M''$  through the medium of spring-pawl  
90  $N$ . The key marked "10" is so arranged in relation to the fulcrum of lever  $H$  that it moves the long arm of the latter the shortest distance of any of the keys of the ten series and just  
95 far enough to rotate the ratchet-wheel and its shaft  $M$  a distance equal to ten points on the numbered wheel  $P'$ . At the termination of a stroke upon this or any of the other keys the pawl  $Q$  on the bar  $Q'$  enters a notch on  
100 wheel  $P$ , which wheel, being fixed to the shaft  $M$ , immediately arrests further movement of the numbered wheel to prevent it from registering too much. The key "2" is next depressed and lowers the long arm of lever  $G$ , which  
105 through the medium of the pawl  $M'$  rotates the wheel  $M$  a distance sufficient to advance the numbered units-wheel  $P'$  two points farther. The sweep of lever  $G$  when this key is struck cannot advance the ratchet farther  
110 than two points, owing to its limited movement. At the termination of this second stroke "12" will appear at the sight-hole  $b'$ . The next key to be depressed is the one marked "20," and it repeats the action of number "10,"  
115 but, being nearer the fulcrum of the lever  $H$ , advances the ratchet-wheel  $N''$ , and hence the numbered wheel  $P'$ , twenty points. The key marked "90" is next depressed, and, being still closer to the fulcrum  $K$ , moves the long  
120 arm a greater distance, and therefore advances the ratchet and its numbered wheel  $P'$  ninety points farther. At this point the addition of ninety points to the thirty-two already registered moves the wheel  $P'$  just  
125 twenty-two points past a complete revolution and advances the dollars-wheel  $S$  one point, so that the sum of "\$1.22" is now visible through the sight-hole  $b'$ . As the primary wheels  $P'$  and  $S$  can register only  
130 as high as \$99.99, the secondary pair  $X X'$  can be thrown into gear with them by means of the lever  $b$ , so as to commence registering hundreds of dollars in the manner previously described. Should five hundred dollars be



required to be registered, it can be done by simply striking the "100" key five times, for this key, being the closest to the fulcrum K, will move the lever the farthest, and it is so arranged and timed as to move the ratchet N" a complete revolution at every stroke.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

10 1. In an adding-machine, the combination, with the registering and ratchet wheels, of a pair of long levers engaging said ratchet-wheels and extending in a direction substantially parallel to the axes of the wheels, key-  
15 levers for actuating the long levers, each of said key-levers having a link connected thereto and a slot in the link, which embraces the long levers, substantially as set forth.

20 2. In an adding-machine, the combination, with the registering and ratchet wheels, of a pair of long levers extending in a direction substantially parallel with the axes of the said registering-wheels and engaging said ratchet-wheels, key-levers arranged to actuate  
25 the long levers, whereby the registering-wheels are rotated or partially rotated, and a pivoted frame, a carry and a stop pawl operating in conjunction with the same, substantially as described.

30 3. In an adding-machine, the combination of a pair of long levers provided with weights and connected to a set of ratchet-wheels hav-

ing their axes substantially parallel with the levers, said ratchet-wheels being connected to co-operate by means of pawls secured to one  
35 and engaging the other, a rack and pinion with which one of the levers is connected, numbered disks or wheels actuated by said ratchet-wheels, key-levers connected to the long levers by slotted links, and a rock-frame  
40 provided with a pawl adapted to engage said ratchet-wheels at the termination of a stroke of one of the keys, all arranged and adapted to operate in the manner and for the purpose substantially as described.

45 4. In an adding-machine, primary registering and ratchet wheels, a pair of long levers engaging said ratchet-wheels and extending substantially parallel with the axes of the registering-wheels, and key-levers actuating said  
50 long levers, in combination with secondary registering-wheels mounted on an independent shaft and a gear-wheel V, connected to the primary wheels and provided with a lever for throwing it in or out of engagement with the  
55 secondary registering-wheels, substantially as specified.

In testimony whereof we affix our signatures in the presence of two witnesses.

CHANDLER A. OAKES.  
JOHN H. JACKSON.

Witnesses:

N. D. CHASE,  
F. W. GIBBS.