

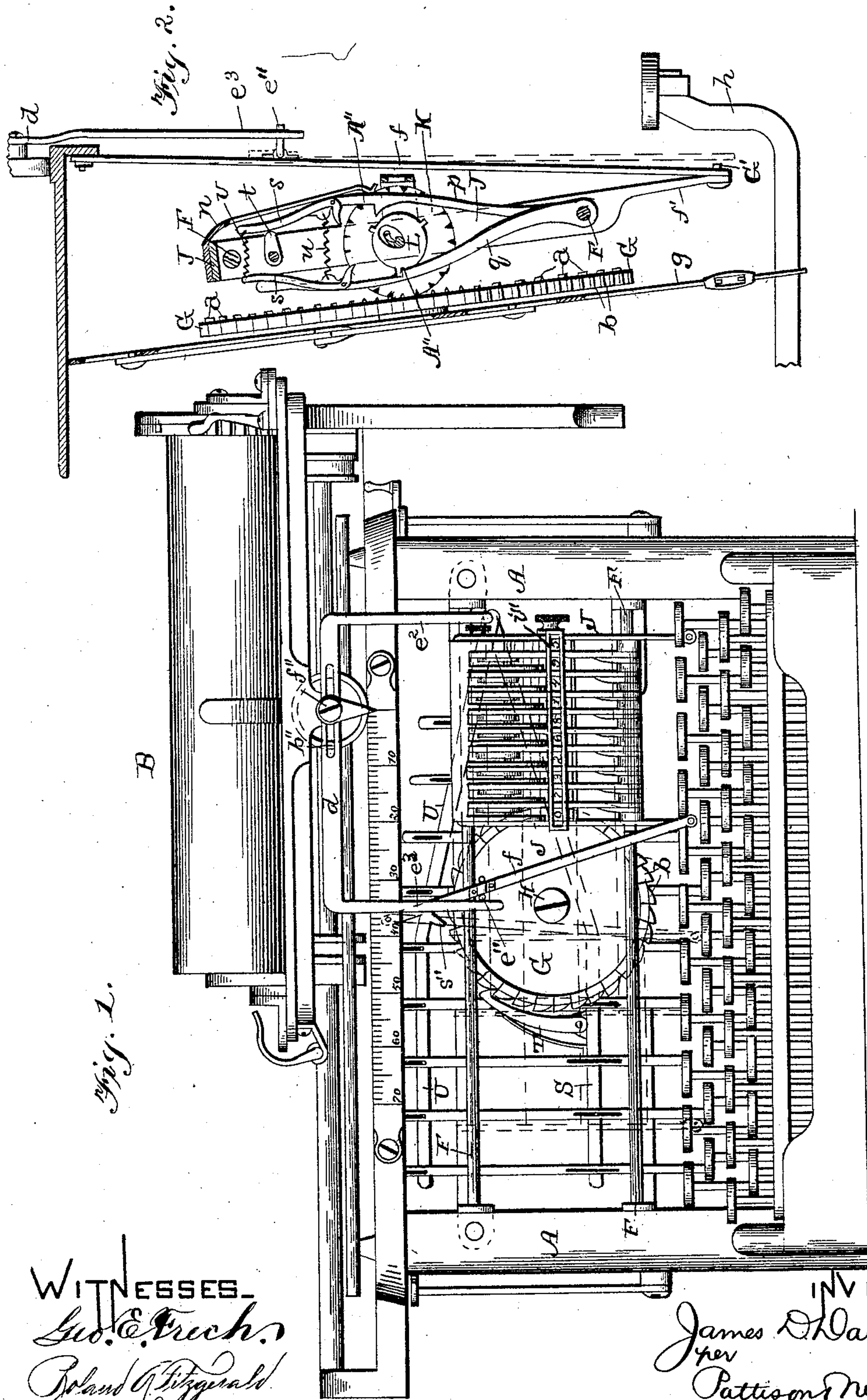
(No Model.)

3 Sheets—Sheet 1.

J. D. DAUGHERTY.  
NUMERAL ADDING OR SUBTRACTING ATTACHMENT FOR TYPE WRITING  
MACHINES.

No. 517,735.

Patented Apr. 3, 1894.



WITNESSES.  
*Geo. E. French.*  
*Poland Fitzgerald.*

INVENTOR.  
*James D. Daugherty*  
Per *Pattison Nesbit, atty.*

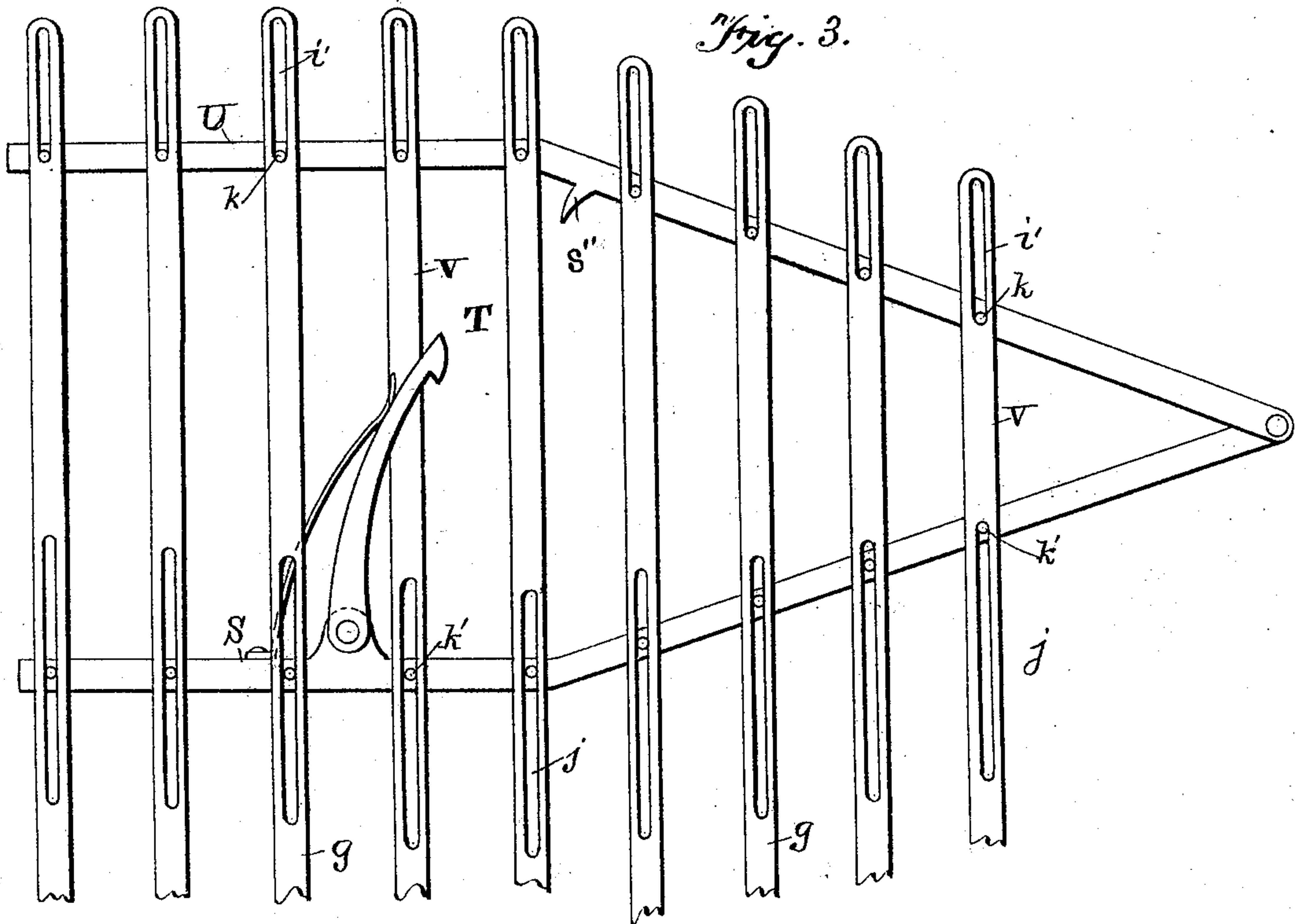
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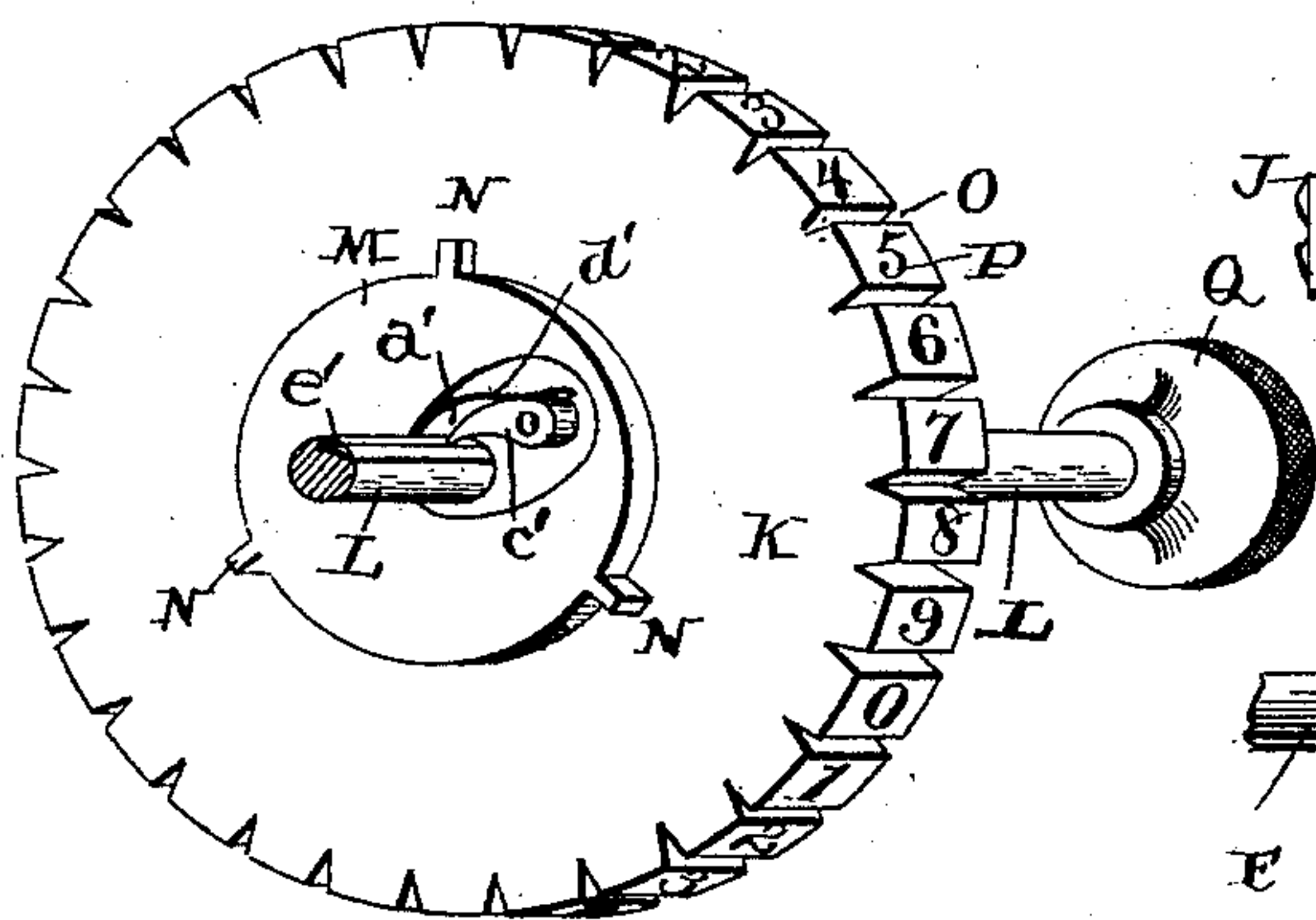
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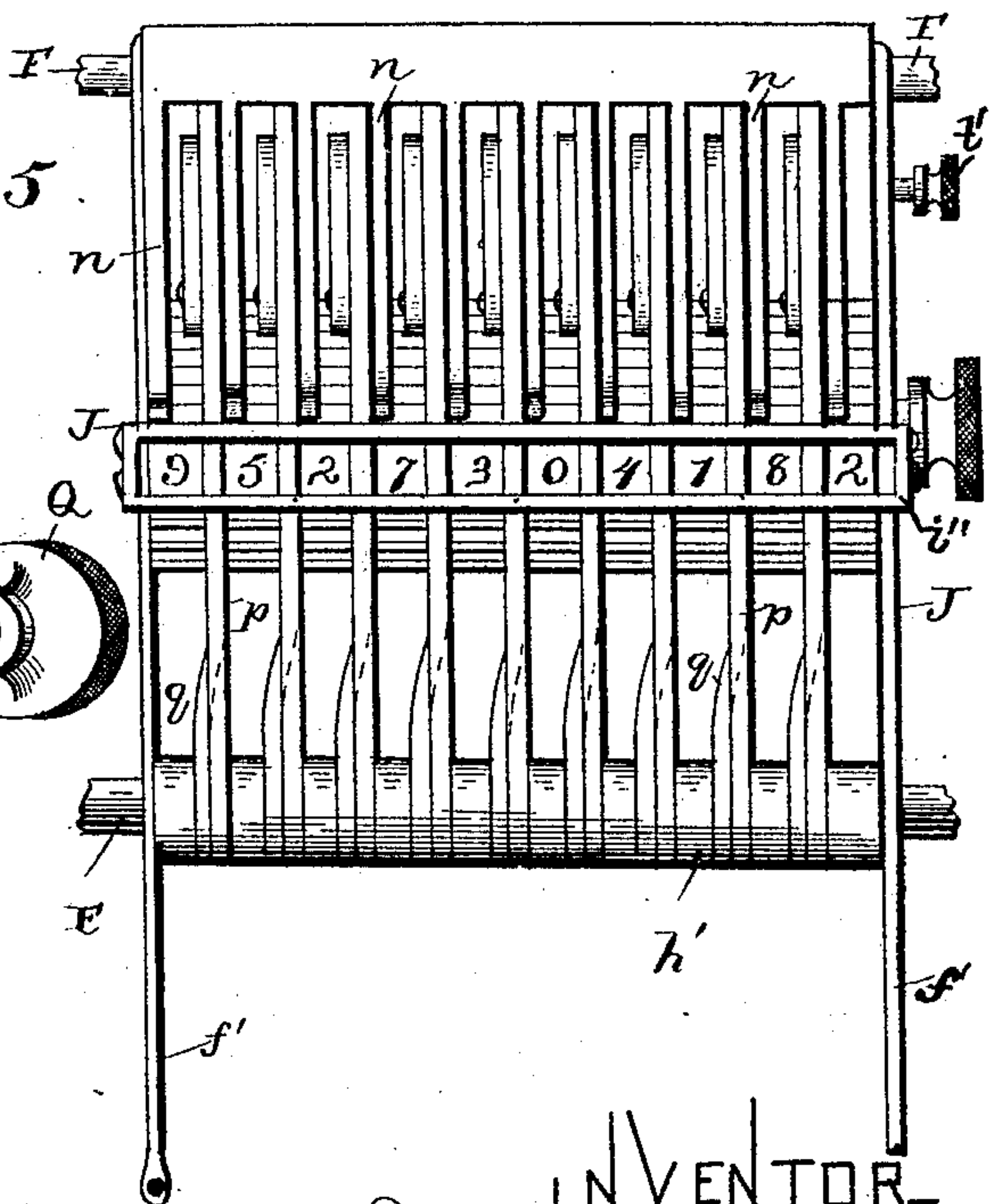
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*Fig. 4.*



*Fig. 5.*



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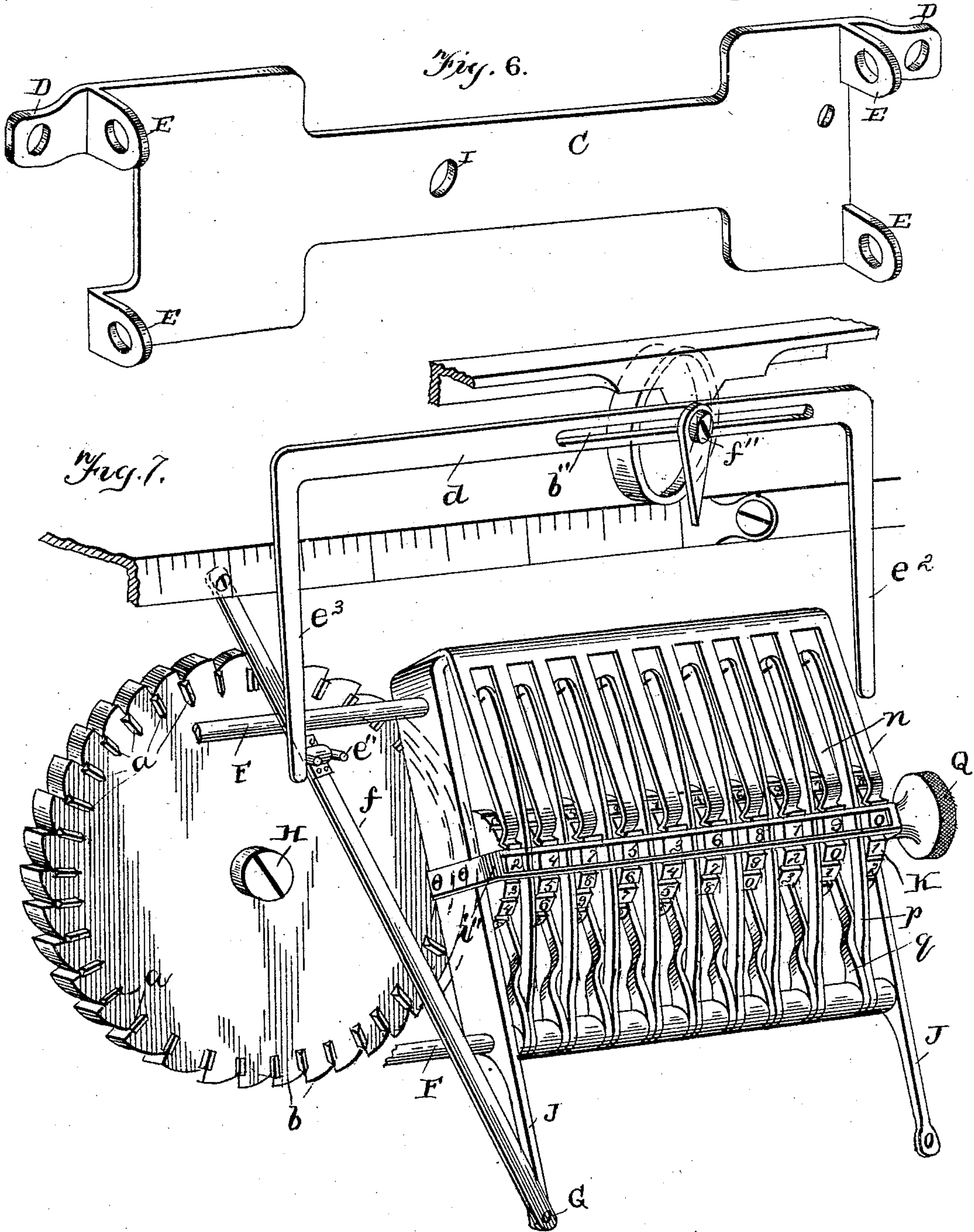
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3 Sheets—Sheet 3.

J. D. DAUGHERTY.  
NUMERAL ADDING OR SUBTRACTING ATTACHMENT FOR TYPE WRITING  
MACHINES.

No. 517,735.

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WITNESSES.  
Geo. E. Truck.  
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INVENTOR.  
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# UNITED STATES PATENT OFFICE.

JAMES DENNY DAUGHERTY, OF KITTANNING, PENNSYLVANIA.

NUMERAL ADDING OR SUBTRACTING ATTACHMENT FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 517,735, dated April 3, 1894.

Application filed July 5, 1893. Serial No. 479,648. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES DENNY DAUGHERTY, of Kittanning, in the county of Armstrong and State of Pennsylvania, have invented certain new and useful Improvements in Adding and Subtracting 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in adding and subtracting machines: the objects of which are, first, to provide a simple adding mechanism capable of attachment to a type-writing machine, whereby when a number is printed in either the units, tens, hundreds, column, &c., the numeral printed will be added by the mechanism, as units, tens, hundreds, &c., according to the column in which the numeral is being printed, so that in making out a bill, or in writing columns of figures, the total will show upon the face of the numeral wheels; second, to so construct the mechanism that it is equally adapted for either adding or subtracting; third, to have the adding mechanism move faster than the type-writer carriage which impels it, so that numeral wheels of greater thickness than the width of the type or distance traveled by the carriage can be used, to afford more room for large numerals which can be easily read by the operator; fourth, in the construction and arrangement of the mechanism independent of the adaptation thereof to a type-writing machine.

In the accompanying drawings: Figure 1, is a front elevation of a type-writer with my invention applied thereto. Fig. 2, is a vertical transverse sectional view of my invention, showing its relative position to the upper portion of the frame of the type-writer, and also to the keys which operate it. Fig. 3, is an enlarged view showing the construction of the connections between the mechanism and the keys of the type-writer. Fig. 4, is a perspective view of one of the numeral wheels of my invention. Fig. 5, is a front elevation, somewhat enlarged, of the carriage which contains the adding or subtracting mechanism. Fig. 6, is a detached enlarged perspective view of

the frame for supporting my invention by attachment thereof to the frame of the type-writer. Fig. 7 is a perspective view showing the connection between the computing carriage and the type writer carriage, and the connection between the register actuating wheel and the number wheels, and the carrying devices.

A represents a frame of a type-writer of the Remington class, and B the traveling paper carriage thereof.

C is a horizontal plate which is placed between the front vertical standards of the type-writer frame and secured thereto by the longitudinal ears D, through which and the standards of the type-writer clamping bolts pass as shown in Fig. 1. Projecting outwardly from the ends of this plate C are the ears E, in which the ends of the horizontal carriage supporting rods F are suitably fastened.

G represents a wheel journaled upon the supporting plate C, intermediate its ends, by means of a screw or bolt H, which passes through an opening I, made in the said plate C, and this wheel G, which I may term a universal power wheel, is provided on its outer face with the cog teeth *a*, and in its peripheral edge are formed the ratchet teeth *b*. Supported on the rods F is a rectangular frame J, forming a carriage for carrying the adding or subtracting mechanism. Passing transversely through the frame J, preferably about its vertical center is a shaft L, upon which are journaled the numeral wheels K, which form part of the adding and subtracting mechanism. Rigidly attached to one side of each of these numeral wheels K, is a disk M, provided at its periphery with three projections N, for a purpose presently to be described. The periphery of these numeral wheels K, are provided with the notches O forming cog teeth with flat faces for the reception of the numerals P, as clearly illustrated in Fig. 4. A recess *a'* is cut in the disk M, and pivoted upon the wheels K within this recess is a dog *c'*, which has its free end engage a longitudinal notch *e'* formed in the shaft L, and this pawl is held in engagement with the shaft L, by means of a spring *d'*.

Pivoted at their lower ends upon the lower horizontal bar F are the levers *p*, *q*, each of which is provided with a shoulder *A''*, and



the upper ends of these levers  $p, q$ , are normally drawn toward each other by means of a suitable spring  $u$ . Pivoted intermediate their ends upon these levers are the pawls  $s$ , which have their upper ends normally drawn toward each other by means of a spring  $u$ , by means of which one of the said pawls  $s$ , is normally held in contact with its adjacent numeral wheel as will more fully appear farther on. There is a lever  $p, q$ , carrying pawls for each of the numeral wheels and either of these levers are held out of operative connection with the numeral wheels by means of a cam  $t$ , which will be more fully described presently. Extending from the upper end of this carriage are a series of springs  $n$ , which have their lower ends engage lightly the periphery of the numeral wheel to prevent them from being turned except when positively actuated by means of one of the said levers.

A lever  $S$  has one end thereof pivoted to the supporting plate  $C$ , and its opposite end extending toward the opposite end of said plate, and pivoted intermediate this lever is an upwardly extending spring actuated pawl  $T$ , which engages the peripheral ratchet teeth  $b$ , of the power wheel  $G$ .

A lever  $f$  has its upper end pivotally connected with the frame of the type-writer, and its lower end is held in operative engagement with one of the downwardly extending ends  $f'$ , of the carriage  $J$ . A swinging projection  $e''$  is attached to this lever intermediate its ends, and this swinging projection  $e''$  is engaged by downward extending arms  $e^2$  and  $e^3$  of the adjustable operating device  $d$ . This device  $d$  is longitudinally adjustable upon the type-writer carriage by means of a longitudinal slot  $b''$ , through which the screw  $f''$  which holds the pointer of the type-writer carriage, passes.

The lower end of the lever  $f$ , is connected with the carriage  $J$ , by means of an outwardly extending pin  $G'$  from one of the depending arms  $f'$  which extend into an opening formed in the lower end of the said lever. By means of this construction, this lever  $f$ , can be attached to either of the depending arms  $f'$ , by simply springing it outward sufficiently for that purpose, as shown in Fig. 2, the same being detached from one arm  $f$ , and attached to the other, for a purpose to be described farther on.

The lever  $S$  which actuates the universal power wheel is connected with the key levers  $h$  of the type-writer which represents the figure thereof, by means of the connection  $g$ , so that when one of the key levers  $H$  is depressed the lever  $S$  is carried down with it, and by the engagement of the pawl  $T$  with the periphery of the power wheel, the said wheel is revolved for the purpose of revolving one of the numeral wheels, as will appear presently.

A stop lever  $U$  has one end pivoted preferably on the same pivotal point as the actuating lever  $S$ , and this stop lever is provided with a tooth  $s''$ , which when depressed engages the periphery of the power wheel for

the purpose of stopping it when it has revolved the proper distance to revolve the numeral wheels the proper number of cogs to correspond with the number which the key lever represents, and also to prevent the said universal wheel from overthrowing on account of the movement given it when the key lever is struck with a quick blow. This is effected by providing the key levers  $S$  and  $U$ , with outwardly extending pins  $k, k'$ , and providing the connecting rod  $V$  with longitudinal slots  $i, j$ . The rod  $V$  at the right hand end of figures 1 and 3, is the connection which connects the key lever representing 9, with the adding mechanism. It will be noticed that this right hand connection  $V$  has the upper wall of its longitudinal slot  $j$ , normally in engagement with the pin  $k$ , which moves in said slot. The object of this is that when the key lever representing 9, is depressed the lever  $S$  is carried down its greatest distance, so that the power wheel  $G$  is revolved the greatest distance, and by contact of its cog  $a$ , with one of the numeral wheels, the said numeral wheel is likewise revolved 9. The downward movement of this connection, and likewise all the other connections, is represented by the length of the slots  $i'$ , in their upper ends. From this it will be seen that when, for instance, the connection at the right hand end of figure 3, is depressed and which is connected as before stated, with the key lever representing figure 9, the said connection moves downward the distance necessary to revolve one of the numeral wheels eight cogs before the upper wall of this longitudinal slot  $i'$  engages its pin  $k$ , which extends outward from the lever  $U$ . Then as it is carried on down sufficiently to carry the wheel one cog farther the lever  $U$  is carried down with it, and consequently the pawl thereof is caused to engage the peripheral ratchet teeth of the power wheel, and therefore prevent the said power wheel from overthrowing, as before stated.

Attention is directed to the succeeding connections, from which it will be seen that each succeeding connection has the upper wall of its lower slot  $j$ , farther from its pin  $k'$ , so that when for instance, the key lever representing the figure 8, is depressed and which is the one just at the left of the right hand connection, the said connection moves downward with the key lever sufficiently far to represent one cog before the connection engages the lever  $S$  carrying it on down. Owing to this fact, although the key lever which represents 8, travels down as far as the key lever which represents the figure 9, the lever  $S$  only travels sufficiently far to revolve through the medium of the power wheel the numeral wheel eight cogs. This is continued throughout the connections in succession toward the left of the mechanism, so that each connection depresses the lever  $S$  less than the preceding connection so as to revolve the numeral wheel one cog less. The locking of the power wheel by the upper lever  $U$  is the same with all of



the connections as will be readily understood, for all of the connections travel the same distance downward, with the key lever, but the distance which the universal wheel revolves is regulated by the downward movement of the lever S, and the downward movement of the lever S is in turn regulated by the distance of the upper wall of the lower slot *j*, from their pins *k'*, as will be clearly understood.

In operation the carriage J which carries the numeral wheels travels across the face of the power wheel G. This is caused by the arms *e*<sup>2</sup>, *e*<sup>3</sup> which engage the projection *e''*, as the carriage moves across the type-writer the arm *e*<sup>2</sup>, carrying the numeral carriage from right to left, and the arm *e*<sup>3</sup>, carrying it in the opposite direction by engagement with the projection *e''*. When the carriage of the type-writer is in the position shown in Fig. 1, the arm *e*<sup>3</sup>, is in engagement with the projection *e''*, and therefore the adding mechanism has been moved to the right as there shown. In this position when a bill is being made out for instance, the operator begins by writing the articles which are charged upon the bill, and after this is written, if the paper carriage has not traveled far enough to bring the arm *e*<sup>2</sup> in engagement with the projection *e''* the space key lever of the type writer is struck until the arm *e*<sup>2</sup>, is in engagement with this projection. At this point the paper upon the type writer carriage will have the billions column at the printing point, and the left hand wheel of the numeral carriage in contact with the right hand side of the power wheel to be revolved by engaging with the cog on the face thereof. This left hand numeral wheel represents the billions column. The operator having first determined upon what part of the paper he wishes the billions column to begin, or the millions or thousands column as the case may be, the device *d*, is moved upon the carriage of the type writer, so that the proper numeral wheel of the adding mechanism will be in engagement with the cog *a*, of the power wheel, and the arm *e*<sup>2</sup>, in engagement with the projection upon the lever *f*. This adjustment having been made, it will be clear that, for instance, if the key lever representing 5 is struck, the power wheel is revolved through the medium of lever S and pawl T, and as before stated is revolved sufficiently to carry the millions or thousands numeral wheel five cogs according to which it is in engagement with, as will be understood from the previous description. The next succeeding figure, whatever that may be is struck, and the carriage having moved when the first figure was struck, the adding mechanism will likewise move, so that the next numeral wheel is in contact with the power wheel to be revolved. This is continued throughout the entire printing of the amount and when the bill is printed the total of all the amount printed will appear upon the faces of the numeral wheels

in a horizontal line through the slot formed in the indicator plate *i''*. The adding mechanism is set at zero whenever desired, by revolving the nut Q' attached to the shaft L, in the same direction in which the numeral wheel revolves, so that as the shaft revolves the dogs *c'* engages the longitudinal notch *e'* in the said shaft, thus revolving all the wheels together, so that they can be carried around to zero through the indicator plate, as will be readily understood, while at the same time the pawl *p'* allows the numeral wheels to freely revolve in the direction for adding.

The adding mechanism is made to travel faster than the carriage of the type writer owing to the fact that the intermediate operating device *d*, engages the lever *f*, between its ends. Owing to this fact it will be seen that the lower end of the lever *f* travels considerably farther than the point thereof to which is attached the fixed projection *e''*. The increased movement of the adding mechanism as compared with the movement of the type writer carriage can be regulated according to the position of the swinging projection *e''*, upon the lever *f*, as will be clearly understood.

Each of the numeral wheels is provided with thirty cogs, each of which contains a numeral, and each wheel is divided into three sections, corresponding to the projections N on the disk M. Each section is numbered from 1 to 0 inclusive, and represents ten. When the unit numeral wheel is turned ten cogs, one of the projections N of the disk M, will engage the adjacent lever *q*, (when adding) and gradually force it outward against the tension of the spring *u*. When the projection has reached the shoulder A'' upon the lever *q*, the lever is drawn inward by the spring *u*, the said projection dropping behind the shoulders, and the pawl *s* carried by said lever forces the next numeral wheel which represents tens, one notch. This operation is continued throughout the entire train of numeral wheels, so that when any one of the said numeral wheels have revolved one-third around, the next succeeding numeral wheel is turned one notch to record the ten numbers registered by the preceding numeral wheel. This is the principle of all adding machines and to which I make no claim. It is the construction whereby this principle is carried out which forms a part of my present invention.

When the mechanism is used for subtracting, it is necessary to revolve the numeral wheels in the opposite direction from the revolution given them when the mechanism is used for adding. When the mechanism is used for subtracting, the carriage J is moved to the left until the left hand numeral wheel thereof engages the cogs at the left hand side of the power wheel G. The lower end of the lever *f*, is then detached from the left hand end of the carriage J and attached to the opposite end of the said carriage, which will



bring the said lever in the same position shown in Fig. 1, but the adding mechanism will be to the left of the said lever instead of to the right thereof, as in said figure. The cam  $t$ , is then given a partial revolution by means of its handle  $t'$ , shown in Fig. 5, and thus made to engage the lever  $q$ , and its pawls to force them out of an operative position in relation to the numeral wheel, while at the same time it permits the lever  $p$ , to move inward in operative position in respect to the said wheels. In this position when the power wheel  $G$  is caused to revolve in the manner hereinbefore set forth, the numeral wheels when they are brought into mesh with the cogs  $a$ , of the wheel  $G$  are caused to revolve in the opposite direction from that when the machine is being used for adding, as will be clearly understood, and the lever  $p$ , will operate to move the succeeding numeral wheel in the same manner as the levers  $q$ , do when the machine is operating for the purpose of adding.

When it is desired to throw the adding mechanism out of operation, so that the type writer can be used independent thereof for writing letters, and other matter, the swinging projection  $e''$  is thrown up or down so that the arms  $e^2$  and  $e^3$ , will not engage it, and the adding carriage is moved to the right sufficiently far to carry the left hand numeral wheel thereof out of mesh with the cogs upon the face of the power wheel  $G$ . In this position the typewriter can be used for printing without effecting the adding mechanism in any respect.

I here show the numeral wheels sufficiently large to be divided into three sections of ten cogs each, for the purpose of gaining leverage in revolving the same. However it will be understood that these wheels can be made one-third smaller and contain only ten cogs, and the operation of the invention be just the same, except that the levers  $q$  and  $p$ , will only be operated to turn the succeeding wheel when a numeral wheel has made a complete revolution.

While I have described the adding mechanism as especially adapted to be used in connection with type writing machines, I do not desire to limit myself to this particular application, for the reason that the improvements in the adding mechanism can be used for adding without any connection with a typewriting machine, by simply having a separate feed mechanism for the adding carriage.

When used in connection with a typewriting machine, it will be noticed that the adding mechanism is moved along by the carriage feed mechanism of the typewriter to which it is applied.

While I have described my adding and subtracting mechanism as especially adapted to be used in connection with typewriters of the Remington style, I do not desire to limit myself to such use, for the same by a slight modification

which will be readily understood, can be applied to nearly or all styles of typewriters which have keys for operating the printing mechanism. So also I do not wish to limit myself to the particular position of my adding mechanism in respect to the key board and to the carriage feed mechanism, for while I prefer that here shown as the most convenient, the same could be varied by a slight modification, as will be readily understood.

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

1. The combination with a type writing machine, of a computing mechanism situated on a line drawn from the key board to the type writer carriage, connections between the type writer keys and the computing mechanism and an operating connection between the carriage feed mechanism and the said computing mechanism.

2. The combination with a type writing machine, of a supporting plate secured to the inner side of the carriage frame between it and the key board and below the carriage, a computing mechanism supported by the said plate, connections between the type writer keys and the computing mechanism and an operating connection between the said carriage feed mechanism and the computing mechanism.

3. The combination with a typewriting machine, of a computing mechanism comprising a carriage carrying numeral wheels, the said carriage moving in a horizontal line across the said typewriter between the key board thereof and the carriage feed mechanism, and a register actuating wheel operated by the keys across which the said computing mechanism moves, and an operating connection between the carriage feed mechanism of the typewriter and the computing mechanism for moving the latter across the said register actuating wheel.

4. The combination with a type writing machine, of a computing mechanism comprising a register actuating wheel situated between the key board and carriage feed mechanism of the type-writer, a computing carriage carrying numeral wheels situated between said register actuating wheel and the key board, actuating connections between said wheel and the key board, and an operating connection between the carriage feed mechanism and the computing carriage.

5. The combination with a type-writing machine, of a computing mechanism having an upright carriage supported on a line drawn from the key board to the type writer carriage and carrying numeral wheels, connections between the computing mechanism and the type writer keys, and an operating connection between the type-writer carriage feed mechanism and the said upright carriage.

6. The combination with a type writing machine of the Remington type, of a computing



mechanism comprising an upright numeral carriage, and an upright register actuating wheel, a connection between the carriage feed of the type-writer and the computing carriage, and operating connections between the type writer keys and the said upright wheel.

7. The combination with a typewriting machine, of a computing mechanism comprising a registering actuating wheel having its face parallel with the travel of the carriage of said machine, a computing carriage carrying numeral wheels moving across the face of said register actuating wheel, and the numeral wheels adapted to intermesh therewith, an operating connection between the key levers of the typewriter and the said register actuating wheel, and an operating connection between the carriage feed mechanism of the typewriter and the said computing carriage.

8. The combination with a type writing machine, of a computing mechanism comprising a carriage carrying numeral wheels, connections between the keys of the type writer and the said numeral wheels, and a connection between the type writer carriage and the computing carriage having an adjustment lengthwise said carriages.

9. The combination with a printing mechanism comprising a carriage, of a computing mechanism comprising a computing carriage carrying numeral wheels, connections between the key levers of the typewriter and the numeral wheels of the computing carriage, and a speed increasing connection between the carriage feed mechanism of the typewriter and the computing carriage, whereby the latter moves a greater distance than the said typewriter carriage for each impression made.

10. The combination with a printing mechanism comprising key levers and a carriage, of a computing mechanism comprising a register actuating wheel, and the computing carriage carrying numeral wheels both situated inside of the key levers of the typewriting machine, an operating connection between the key levers and the register actuating wheel, a register actuating wheel stop, and a connection between the typewriter key levers and the said register actuating wheel stop.

11. The combination with a printing mechanism, comprising key levers and a carriage feed, of a computing mechanism situated between the key board and the carriage feed mechanism, a movable connection between the carriage feed mechanism and the said computing carriage, whereby the same can be thrown out of operative connection with the said printing carriage mechanism.

12. A computing mechanism comprising a register actuating wheel having cogs on its face, a computing carriage supported in a line with and traveling across said wheel and carrying numeral wheels, the numeral wheels adapted to mesh with the said cogs of the register actuating wheel, key levers, operating connections between the key levers and

the said actuating wheel, and a feed mechanism for the computing carriage.

13. A computing mechanism comprising a register actuating wheel having cogs upon the edge of its face, key levers and connections between the same and the said wheel, a computing carriage carrying numeral wheels which move across the face of the register actuating wheel, and of a length less than the distance across the face of the said wheel, whereby the actuating wheel can be made to operate the numeral wheels in opposite directions by bringing them in contact with opposite sides of the said actuating wheel, and a feed mechanism for the computing carriage.

14. A computing mechanism comprising a register actuating wheel having cogs upon its face, key levers operatively connected with said wheel, a computing carriage carrying numeral wheels, the said carriage adapted to move across the face of the said register actuating wheel to cause the numeral wheel to engage opposite edges of the register actuating wheel for adding or subtracting, two sets of levers for each set of numeral wheels, said levers carrying pawls engaging the succeeding numeral wheel and shoulders carried by the said numeral wheels for engaging the said levers, and a means for throwing one set of levers out of contact with the numeral wheels and permitting the other set to come in contact therewith, whereby the mechanism is adapted for subtracting and adding.

15. A computing mechanism comprising a register actuating wheel having cogs upon its face, a computing carriage having numeral wheels, a feed mechanism for moving the said computing carriage across the face of the register actuating wheel, key levers, connections between the key levers and the register actuating wheel, a lever for each numeral wheel carrying a shoulder, a pawl upon said lever for engaging the succeeding numeral wheel, a spring for holding the lever toward the axes of the numeral wheel and the shoulder upon the numeral wheel for engaging the said lever, the parts operating as described.

16. A computing mechanism comprising a register actuating wheel, a computing carriage, having numeral wheels, a feed mechanism for moving the same across the face of the said register actuating wheel, the said numeral wheels divided into three sections and each section numbered from 1 to 0, shoulders carried by the numerals for each section thereof, a lever pivoted at one end and having an intermediate shoulder engaged by the shoulder upon the numeral wheels, a spring for holding the said lever inward, and a dog carried by the opposite end of the said lever adapted to engage the succeeding numeral wheel, and connections between the key levers and the register actuating wheel.

17. A computing mechanism comprising a register actuating wheel having cogs upon its face, key levers, connections between the key levers and the said register actuating wheel,



a computing carriage carrying numeral wheels, a feed mechanism for moving the same across the face of the said register actuating wheel, two levers for each numeral wheel, the  
5 said levers carrying intermediate shoulders, projections upon the said numeral wheels adapted to engage the shoulders upon the said levers, springs uniting the said levers, and a  
10 cam for moving either of said levers out of operative connection with the said numeral wheels.

18. A computing mechanism comprising a register actuating wheel having cogs upon its face, key levers, connections between the key  
15 levers and the register actuating wheel, the computing carriage carrying numeral wheels, a feed mechanism moving the said carriage across the face of the register actuating wheel, two levers for each numeral wheel pivoted at  
20 one end and carrying pawls at their opposite ends, a spring uniting each pair of levers, the said levers having intermediate shoulders, projections upon the numeral wheels adapted

to engage the said shoulders, a pawl upon each lever extending upward and normally  
25 inside of the said levers, and a cam adapted to engage first the pawl and then the lever, for forcing either out of operative connection with the numeral wheel.

19. A computing mechanism comprising a  
30 register actuating wheel, a carriage carrying numeral wheels which move across the face of said register actuating wheel and engaging opposite sides thereof, a carrying device between the numeral wheels and operated  
35 thereby, and a means for throwing the carrying device in operative connection with opposite sides of the numeral wheels for the purpose of adding or subtracting.

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

JAMES DENNY DAUGHERTY.

Witnesses:

D. B. HEINER,  
WM. BROWN.