

T. OLIVER.

TABULATING ATTACHMENT FOR TYPE WRITING MACHINES.

APPLICATION FILED JAN. 18, 1905.

4 SHEETS—SHEET 1.

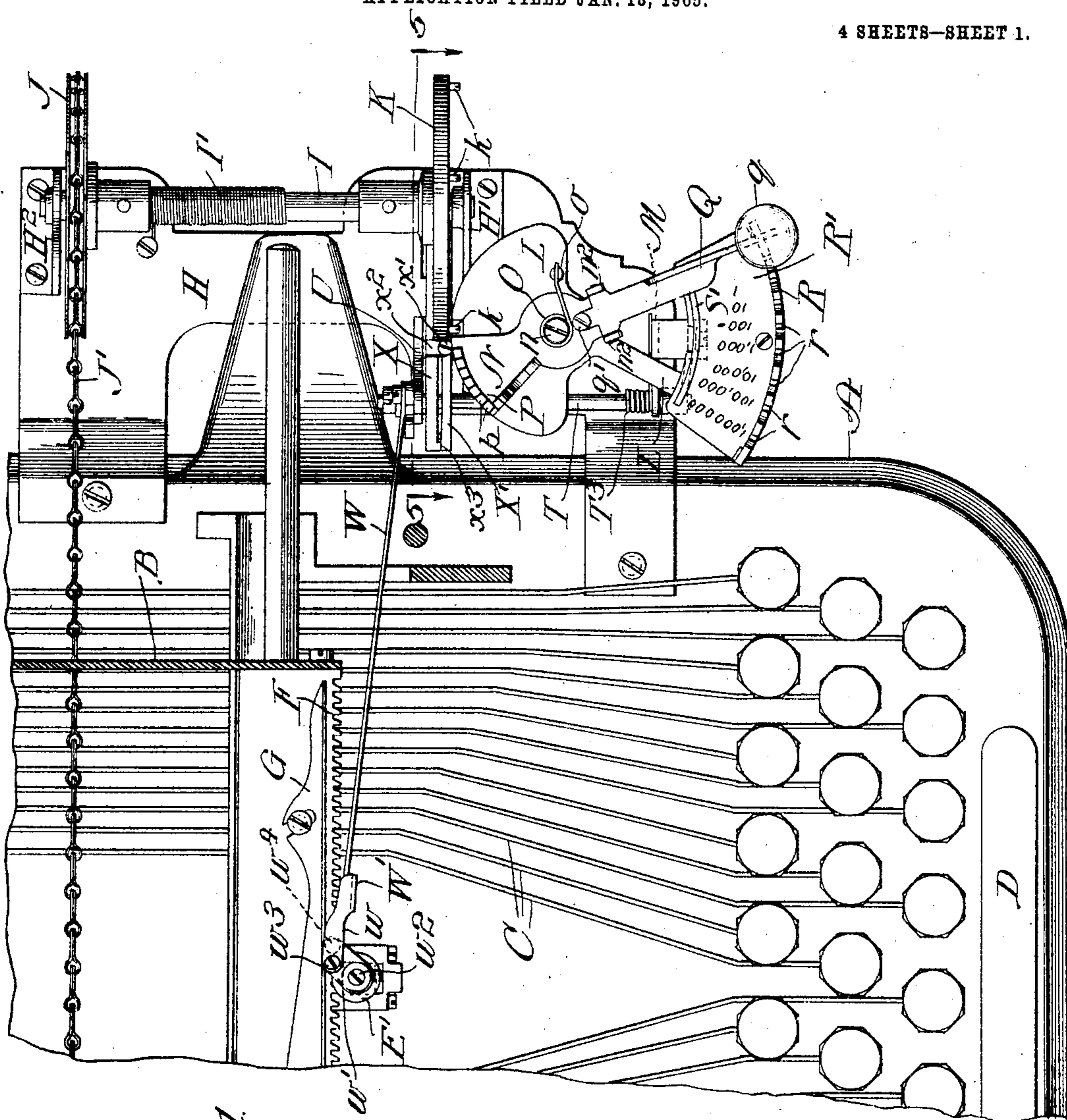


Fig. 1.

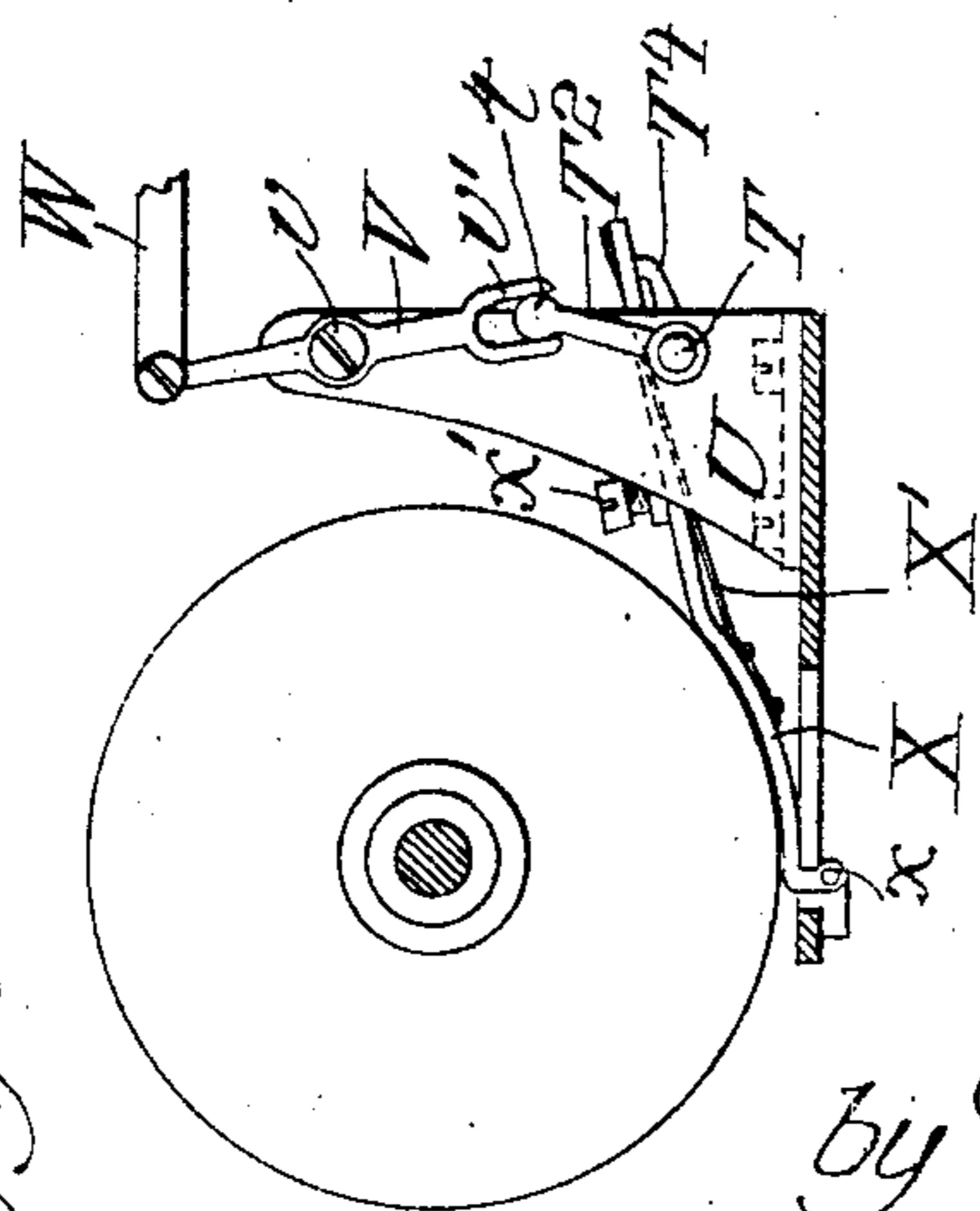


Fig. 5.

Witnesses;
Edw. P. Barrett
H. G. Barrett

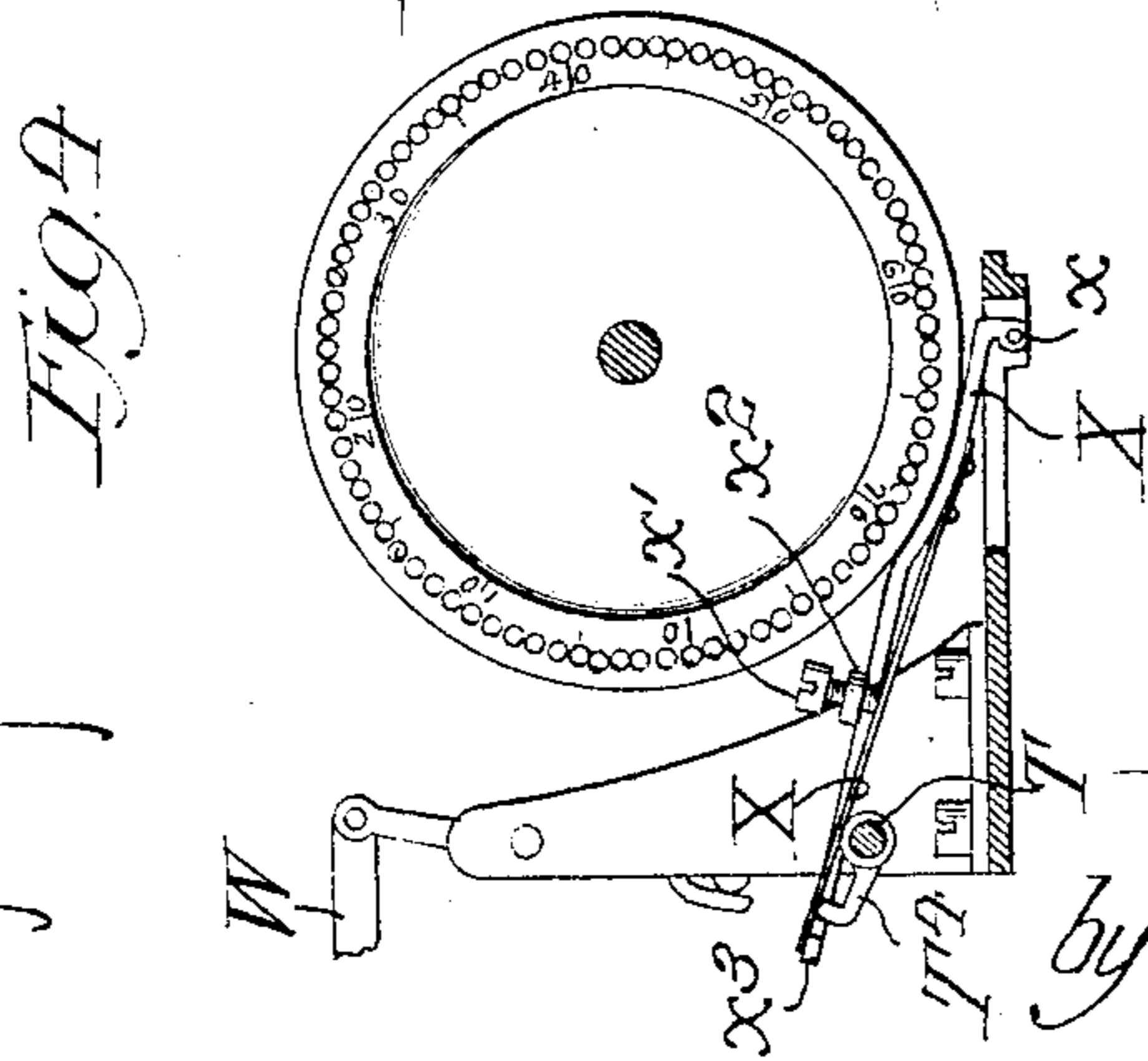
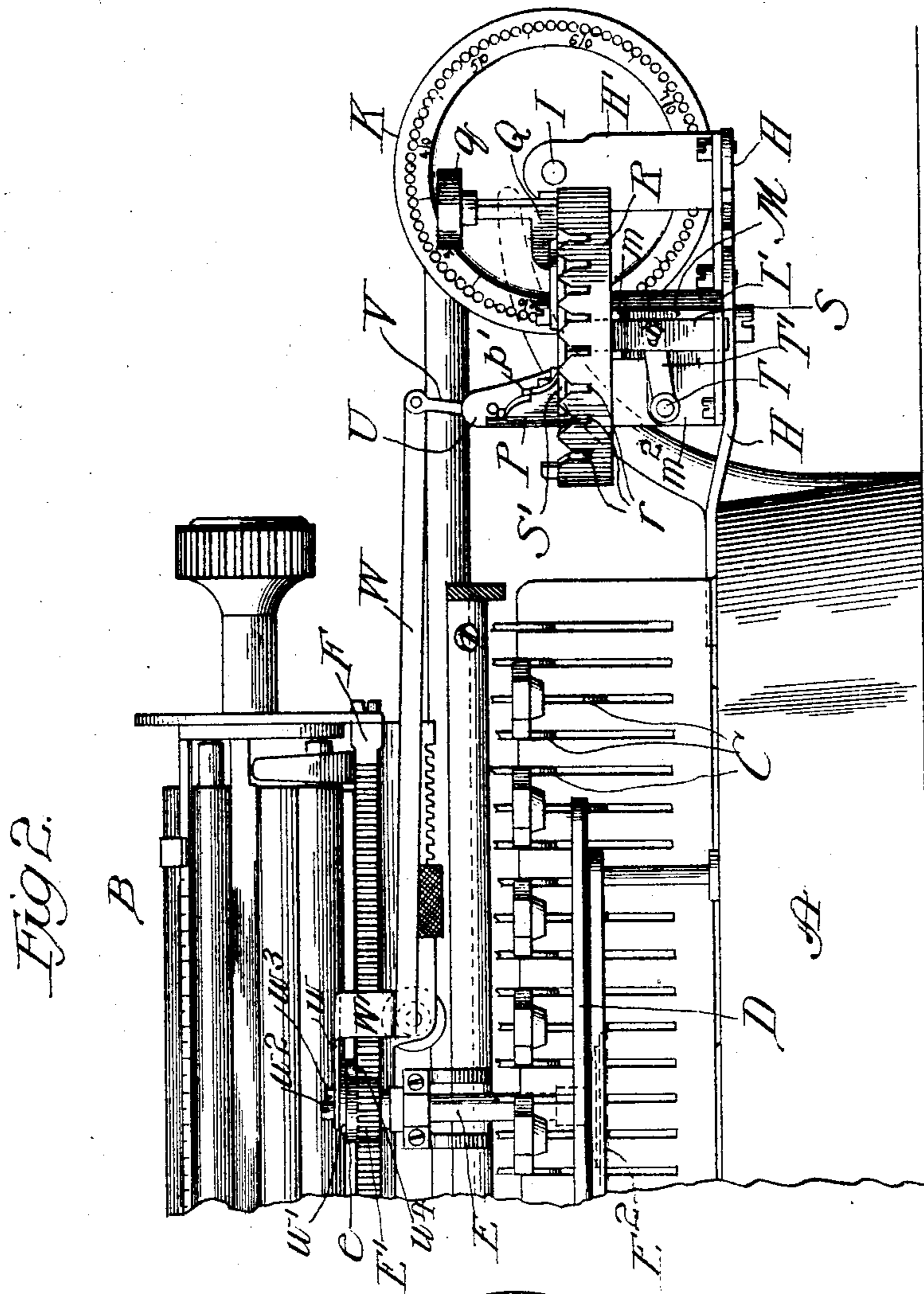
Inventor
Thomas Oliver
by Poole & Brown
his Attys.

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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

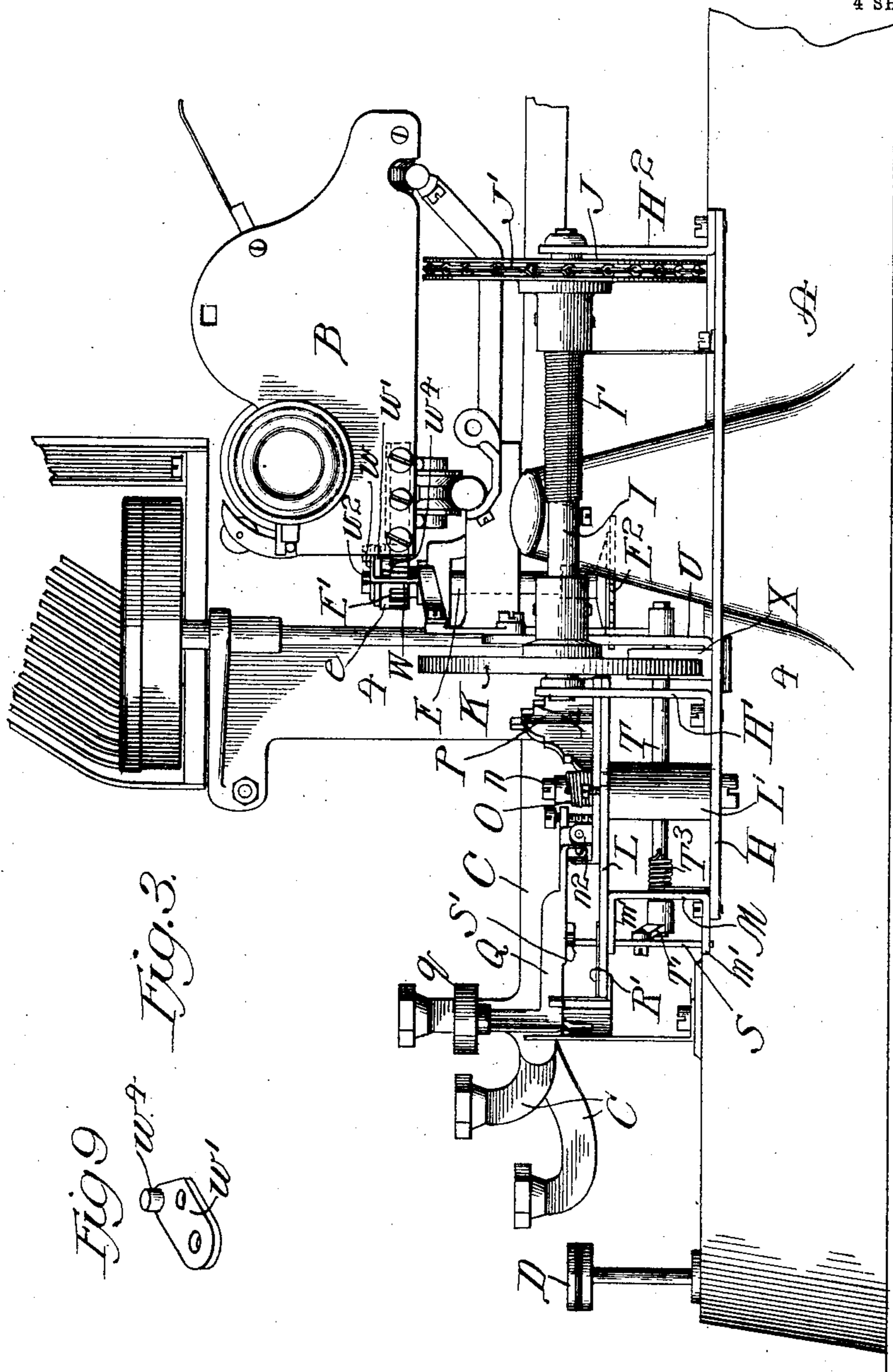


Fig. 3.
Fig. 9
Fig. 10

Witnesses
Edw. R. Barrett
H. B. Barrett

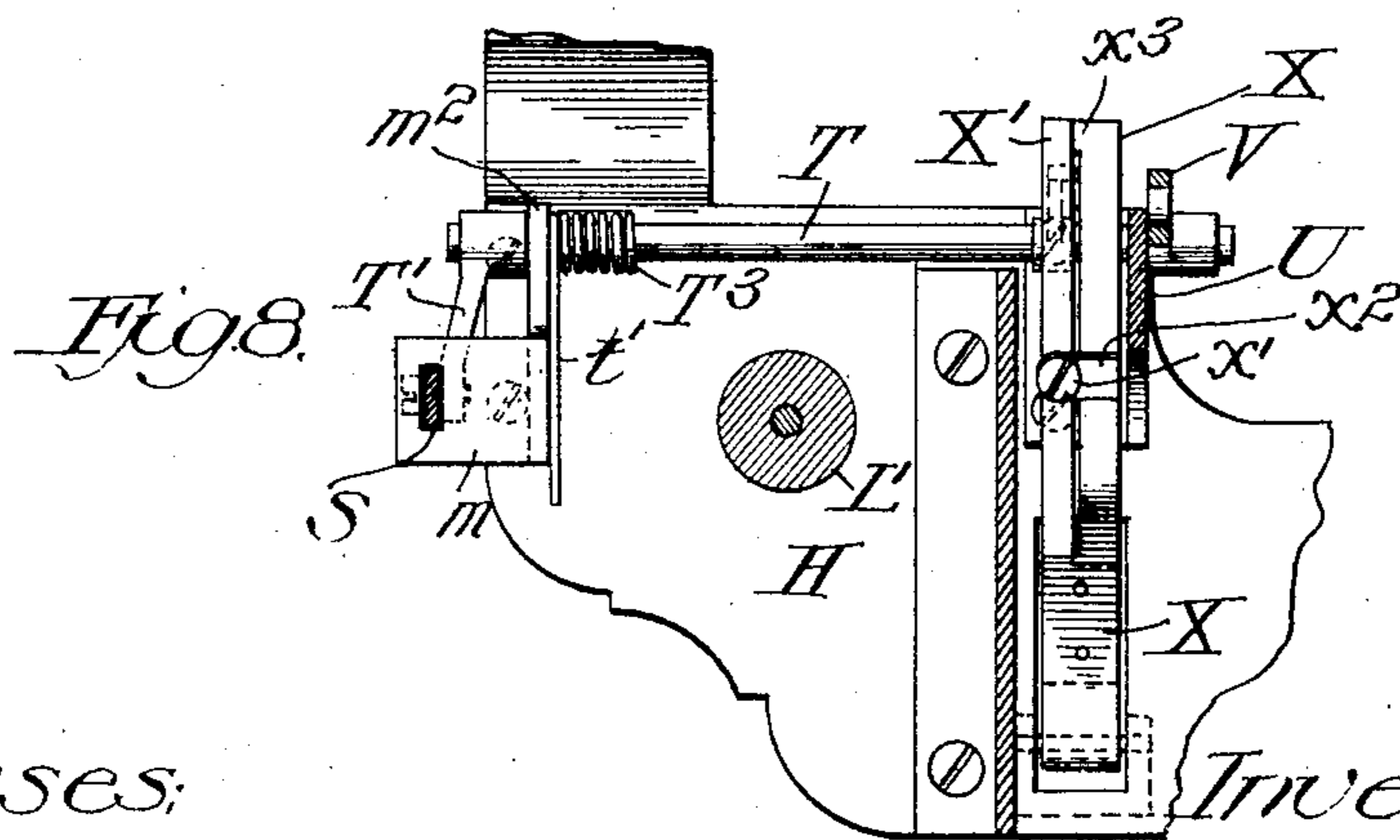
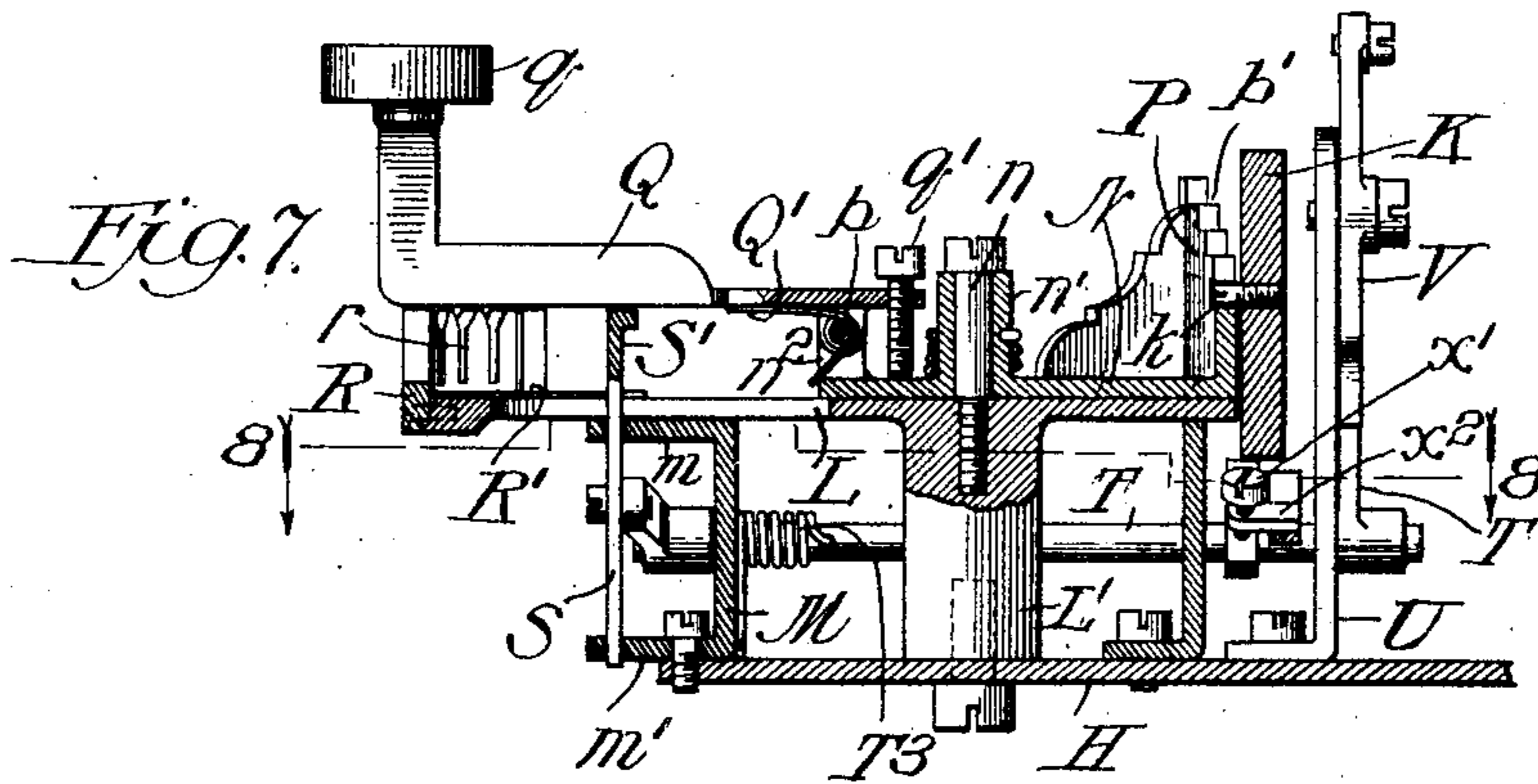
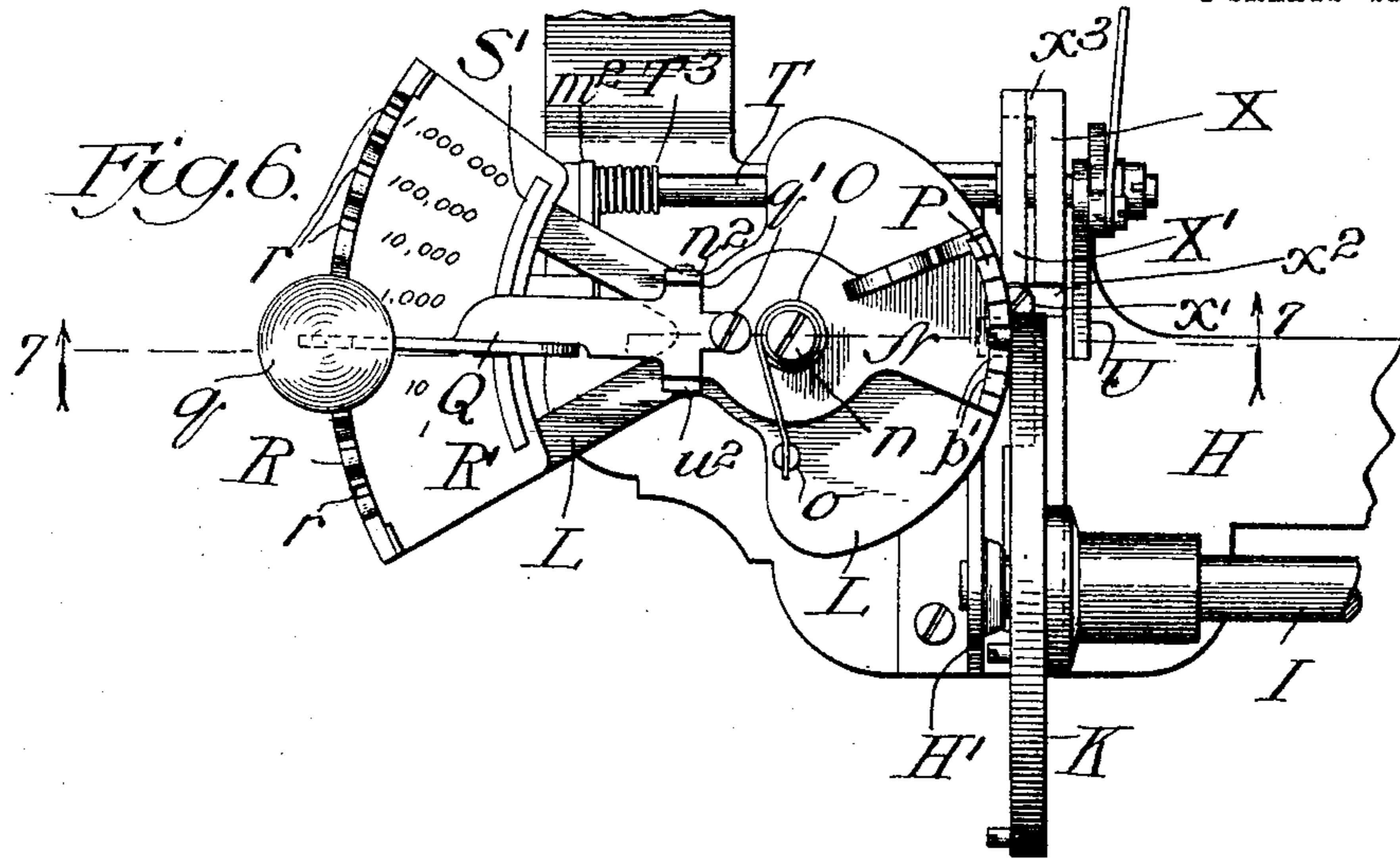
Inventor
Thomas Oliver
by Pool & Brown
his Atty's.

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4 SHEETS—SHEET 4.



Witnesses:

Edw. R. Barrett

H. G. Barrett

Inventor

Thomas Oliver

by *Poole & Brown*
his Attys.

UNITED STATES PATENT OFFICE.

THOMAS OLIVER, OF DENVER, COLORADO, ASSIGNOR TO OLIVER TYPEWRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TABULATING ATTACHMENT FOR TYPE-WRITING MACHINES:

No. 799,490.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed January 18, 1905. Serial No. 241,675.

To all whom it may concern:

Be it known that I, THOMAS OLIVER, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Tabulating Attachments for Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, 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 an attachment for type-writing machines designed to facilitate the work of tabulating or columnating figures of various denominations and which is so constructed and arranged that in doing tabulated work the paper-carriage of the type-writer upon the movement of a single vertically and horizontally movable key will be released from the usual letter-spacing devices of the machine and stopped in position for printing the first figure or numeral of the numbers to be printed in a column.

The invention consists in the matters herein-after described, and more particularly pointed out in the appended claims.

The invention is herein shown as applied to form of type-writing machine known as the "Oliver" type-writer; but the principal features of the invention may also be applied to other type-writing machines.

In the accompanying drawings, Figure 1 is a fragmentary plan view, partially in section, of a type-writing machine equipped with a tabulating mechanism embodying my invention. Fig. 2 is a front elevation of the parts shown in Fig. 1. Fig. 3 is an end view of the principal parts of the machine, showing the tabulating mechanism in side elevation. Fig. 4 is a sectional elevation taken upon line 4 4 of Fig. 3. Fig. 5 is a like sectional elevation taken upon line 5 5 of Fig. 1. Fig. 6 is a detail plan view of the main parts of a tabulating mechanism made on an enlarged scale. Fig. 7 is a sectional elevation thereof, taken upon line 7 7 of Fig. 6. Fig. 8 is a plan section taken upon line 8 8 of Fig. 7. Fig. 9 is a perspective view of a crank-arm on the pinion of the letter-spacing device separate from other parts and in inverted position.

As shown in said drawings, A designates the base-plate of the machine, and B the carriage, which is given the usual endwise or letter-spacing movement by a suitable carriage-actuating spring. C C designate key-levers, and D the spacing-key. Said parts of the device and the letter-spacing mechanism are herein shown as made like those employed in the Oliver type-writing machine.

The letter-spacing mechanism embraces an upright escape-wheel shaft E, which carries at its upper end a pinion E', which pinion meshes with the rack-bar F, attached to the carriage-frame. An escape-wheel E² is attached to the lower end of the shaft E and co-operates with other parts of the letter-spacing mechanism, as in said Oliver machine. Said shaft has at its lower end oscillatory movement in a bearing there located, so that its upper end may swing toward and from the rack-bar F.

G indicates the laterally-movable release-bar, which is mounted above the rack-bar F and is adapted to act upon an annular surface at the top of the pinion E' to shift said pinion outwardly away from the rack-bar, and thereby release the carriage from the letter-spacing mechanism.

Now, referring more particularly to the parts constituting the present invention, H indicates the horizontal supporting-plate constituting the base-plate of the tabulating mechanism and which is attached to the machine-frame and projects therefrom at the right-hand end thereof.

H' H² indicate standards which rise from the rear part of the plate H and afford bearings for a horizontal shaft I, which extends in a direction from front to rear of the machine and is provided at its rear end with a grooved wheel J and at its forward end with a disk K.

J' indicates a strap or chain which is attached to and wound on the grooved wheel J and the opposite end of which is attached to the carriage.

A coiled spring I', placed around the shaft I, acts on said shaft to turn the same in a direction to keep the chain J' stretched or extended and which turns the shaft I backwardly when the carriage is thrown by hand toward

the right or to its starting-point in beginning a new line of writing. The turning of the shaft I in the opposite direction is effected by the carriage-actuating spring, which is stronger than the spring I' and turns the shaft I against the action of said spring I' in the movement of the carriage to the left, or during the letter-spacing movements of the carriage.

On the disk K are located a series of stop projections k , which are circumferentially adjustable thereon and project from the front face of said disk. Said stop projections are preferably formed by means of pins which are inserted in screw-threaded holes in the disk. Supported on the forward part of the base-plate H, above and parallel with the same and forward of the disk K, is a frame-plate L. Said plate is shown as supported from the base-plate H by means of a post L', made integral with the plate L and which rests on the base-plate H and is secured to the latter by a screw or otherwise. The plate L is further connected at its forward end with the base-plate H by means of a standard M.

N indicates a horizontally-arranged oscillatory plate pivoted on a pivot-stud n , which is secured in the plate L and preferably extends into the post L', as clearly shown in Fig. 7.

The plate N is provided with a hub or sleeve n' , which surrounds the bearing-stud n . O is a coiled spring for giving rotative movement to the plate N on its pivot. Said spring O is shown as placed around the hub n' and as attached at one end to said hub and at its opposite end projects from said hub and engages a stud o , fixed in the plate L at the side of the plate N, Fig. 6. Attached to the inner margin of the oscillating plate N is a curved or segmental stop-plate P, which swings or moves in a path adjacent to the front face of the disk K and which is stepped or shouldered at its upper margin to form laterally and vertically spaced stop-surfaces for engagement with the stop-pins k on the disk K. Mounted on the forward end of said plate N, forward of the pivot-stud O, is a forwardly-extending key-lever Q, the same being pivoted to the plate by a transverse horizontal pivot-pin p , passing through upright lugs n^2 on said plate N. The key-lever Q is provided at its forward end with a finger-piece or key q . Attached to the forward margin of said stationary plate L is a segmental guide-plate R, provided with a series of equally-spaced upwardly-opening guide-notches r .

The key-lever Q extends normally above the level of the upper edge of the notched segment R and is held in this position by a spring Q', herein shown as having the form of a coiled spring, placed around the pivot-pin p and bearing at one end on the plate N and at its other end on the under surface of said lever Q, as clearly seen in Fig. 7. The up-

ward movement of said key-lever Q is limited by means of a stop, preferably having the form of an adjustable screw q' , inserted through the rear end of the key-lever Q in position to bear on the top of the plate N. The key-lever Q, arranged as described, is adapted to swing laterally at its front end, carrying with it the plate N and notched segment P, and to be depressed into either one of the notches r of the notched segment R. The notches r in said notched segment R are spaced at angular distances apart corresponding with the lateral spacing of the graduated stop surfaces or shoulders p of the stop-plate P. Said notches r are, moreover, provided with indicating characters running from right to left and designating units, tens, hundreds, thousands, ten-thousands, hundred-thousands, &c., the designating characters, as shown in the drawings, being applied to a plate R', attached to the plate L at the rear of said segment R. The disk K is connected with the paper-carriage of the type-writing machine in such manner as to partake of the letter-space movement of said carriage, as hereinbefore set forth, and the stop-pins k on said disk K are adapted for contact with either one of the several stop surfaces or shoulders of the said stop-plate P, according to the position to which the lever Q is carried when moved or swung laterally from its starting-point at the right-hand side of the segment R. A number of pins k are inserted in the disk K at such distance apart and in such relative position as is called for by the number of columns to be written and the desired lateral position of the same on the written page or sheet. In starting the printing in each column the stop-plate P is swung through the movement of the key-lever Q, which lever is moved to and depressed into a notch corresponding with the number of figures in the number to be written and the stop-plate P thereby shifted to the left to bring the corresponding stop surface or shoulder of the stop-plate P in the path of the stop-pin k and to thereby arrest the movement of the disk K and the carriage, it being understood that the several surfaces on the stop-plate P serve to arrest the turning movement of the disk K under the action of the carriage-actuating spring at different positions, and the carriage is thereby arrested, so as to bring the printing-point on the paper at varying lateral distances to the left of the place at which the number designating units is to be printed, according to the number of numerals or figures in the number to be written.

Provision is made for releasing the carriage from the number-spacing mechanism of the machine, operated by the depression of the key-lever Q, after said key-lever has been moved to bring the stop-plate P into the proper position, so as to permit free move-

ment of the carriage to the point determined by contact of one of the stop-pins k with the opposed stop-shoulder of the stop-plate P, as follows: S is a vertically-sliding bar mounted in guide projections $m m'$, conveniently attached to the post M and provided at its upper end, beneath the lever Q, with a horizontal curved bar S' , which when at the upper limit of its movement stands close to said lever Q and which is forced downwardly by the action of said lever when the latter is depressed into one of the notches r . The said sliding bar S is connected with and gives movement to a horizontally-arranged rock-shaft T, which is mounted at its forward end in a laterally-projecting lug m^2 on the post M and at its rear end in a standard U, which is attached to and rises from the base-plate H at the rear of the disk K. Said rock-shaft T has at its forward end a rigidly-attached arm T' , which is connected with the bar S by means of a stud on the arm engaging a horizontal slot in said bar. At its rear end the rock-shaft T has an upwardly-extending arm T^2 . The upper end of said arm T^2 engages the lower end of a rocking lever V, Fig. 5, which is pivoted between its ends, by means of a pivot-stud v , to the upper end of the standard U. The upper end of said arm T^2 is shown as provided with a rounded head t , engaging a longitudinal slot v' in the lower end of the lever V. The lever V is pivoted at its upper end to a connecting-rod W, which extends to a point adjacent to the upper end of the pinion E' of the escape-wheel shaft E. To the end of the rod W is attached a plate W' , which rises therefrom in front of the rack-bar F of the carriage and has at its upper end a horizontal arm w , arranged in a horizontal plane slightly above the pinion E' and connected with the latter by means of a crank-arm w' . Said crank-arm is pivotally connected with the pinion by means of an axially-arranged stud or screw w^2 and is pivotally connected with the said arm w by means of a pivot w^3 . Said crank-arm is provided with a depending pin w^4 , adapted for contact with the forward edge of the release-bar G, and the arm extends from the pivot stud or screw w^2 in a direction toward the rear and right-hand end of the machine. A coiled spring T^3 surrounds the rock-shaft T and is attached at one end to said shaft and at its opposite end extended to form an arm T' , which bears on the plate H and tends to turn the rock-shaft in a direction to lift the free end of the arm T' , and thus hold the sliding bar S in its elevated position. Said spring T^3 also tends to turn or rotate the rock-shaft T in a direction to throw the lower end of the lever V inwardly or toward the body of the machine and the upper end thereof, with the connecting-rod W, outwardly. The said spring therefore holds the crank-arm w'

normally at the limit of its movement to the right, this being the position which said crank-arm occupies when the pinion E' is in engagement with the rack F. When the key-lever Q is depressed and the bar S thereby moved downwardly, the rock-shaft T is swung or turned against the action of the spring T^3 in a direction to move the upper end of the arm T^2 to the right, and thereby swing the lever T so as to carry its upper end inwardly or toward the left, thereby shifting the connecting-rod W endwise toward the left or the center of the machine. Said endwise movement of the rod W forces the pivot w^3 of the crank-arm w' toward the left and as inward movement of the rear end of said crank-arm is prevented by contact of the pin w^4 thereon with the release-bar G. As said crank-arm swings toward the left and approaches a position at right angles to the rack-bar the pinion will be thrust outwardly far enough to be free from the rack-teeth. The carriage will then be free from its connection with the letter-spacing devices and will move uninterruptedly to the point determined by the stop-pin k on the disk K and the stop surface or shoulder of the stop-plate P, which is then in position for contact with said stop-pin.

In connection with the disk K, adapted to turn or rotate with the movement of the paper-carriage, a brake device is employed to check the turning movement of said disk K as the carriage is moved by its actuating-spring and to thereby avoid the shock or jar which would be occasioned by the striking of the stop-pin k against the stop-plate P in case the parts had uncontrolled movement under the action of said spring. Said brake device, as clearly shown in Figs. 1, 4, 5, 6, and 8, consists of a brake-lever X, which is pivoted to the base-plate H at a point beneath the disk K by means of a pivot x , Figs. 4 and 5. In its part near the disk K the said lever X is curved to conform to the shape of the disk and is adapted to bear upon the periphery of the same. The free end of the lever X extends over the shaft T and is adapted for actuation by means of a rigid arm T^4 , which extends laterally from said shaft and is adapted to bear upwardly on the said lever X. To afford a yielding action of the brake-lever upon the disk, the arm T^4 is not arranged to bear directly upon said lever X, but presses against the free end of a spring-arm X' , which is secured to the brake-lever near the pivoted end of the same and extends parallel with and at one side of the outer end portion of said lever. For the purpose of adjusting the tension of said spring-arm X' an adjusting-screw x' has engagement with the arm X in such manner as to bear downwardly on the spring-arm X' , said screw x' being shown as inserted through a transverse arm or bracket x^2 , attached to the brake-lever and overhanging the

spring in the manner illustrated, Figs. 4, 7, and 8. The brake-lever X is shown as provided with a laterally-extending arm or lug x^3 , which extends beneath the free end of the spring-arm X' and holds the free end of said spring-arm from downward movement under the pressure of the adjusting-screw x' .

In the operation of the brake device above described it will be understood that when the key-lever Q is depressed and the carriage released through the connecting devices hereinbefore set forth the turning of the rock-shaft T in its carriage-releasing movement will swing the outer end of the arm T⁴ upwardly and said arm will act on the spring-arm X' of the brake-lever to lift the free end of said brake-lever and press the latter yieldingly against the periphery of the disk K. By adjustment of the tension of the spring-arm X' through the use of the adjusting-screw x' pressure of the brake-lever upon the disk may be varied or adjusted so that the said disk will be permitted to turn with the necessary speed during the endwise movement of the paper-carriage, but its speed of rotation will be checked, so as to prevent the carriage obtaining too great a rate of speed, and thereby producing excessive shock or jar when the motion of the disk K is arrested through contact of one of the stop-pins k thereon with the stop-plate P.

The device hereinbefore described constitutes an attachment for type-writing machines intended to facilitate speed and accuracy in tabulating work in cases where it is desirable to write vertical columns of words or figures. Where such columns of figures are to be written, it is desirable that all of the units-numerals of the column shall be located under each other in a vertical line and that the tens, hundreds, thousands, &c., numerals of the numbers constituting said columns shall be located in similar relation to each other. The device herein described enables the carriage to be stopped at varying letter-space distances from a predetermined point, thus enabling the figures or numbers of various denominations to be written in their proper relation with respect to such point. As shown in the drawings, the notched segment R has eight notches, the first of which is designated by a zero-mark and the others by the numbers "1, 10, 100, 1,000," &c. The notch marked "1" is designed to receive the key-lever Q in printing in the units-column, the notch marked "10" when printing in the tens-column, and the notch marked "100" when printing in the hundredths-column, &c. If it be desired to write a numeral or numerals at the right-hand side of a decimal-point, the notches may be numbered in both directions from the zero-mark.

The stop-pins k k having been previously set on the disk K in position to correspond

with the points at which it is desired to locate the columns, the key Q is swung to the notch corresponding with the denomination of the first figure of the number to be written and the key depressed. The swinging of the key to the left will bring the proper stop surface or shoulder of the stop-plate P in the path of the pin k which is then approaching it, and as soon as the carriage has been released through the depression of said lever Q the carriage will move to the left and the disk will turn until the movement of the latter is arrested by contact of said stop-pin k with the stop-plate. The carriage will then be in proper position for the printing of the first figure of the number. As soon as the key-lever Q has been depressed and the carriage begins its movement said key is immediately released and will return by the action of the lifting-spring Q' and the spring O to its initial or starting point. The printing of the succeeding numerals in the column is then proceeded with, and after the printing of one number has been completed the key will be similarly moved to the left and depressed for printing the desired number in the next column. The printing having been accomplished in all of the columns, the carriage is then shifted back to its starting-point and the printing of succeeding numbers in the several columns proceeded with as before.

The accompanying drawings illustrate one practical form of construction in which the several features constituting my invention may be embodied; but the device may be variously modified or changed in its structural features and details without departure from my invention, the essential features of which are pointed out in the appended claims.

I claim as my invention—

1. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections to arrest the movement of the carriage at varying distances from a predetermined point, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate and means operated by said key for effecting the release of the carriage from the control of the letter-spacing mechanism.

2. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a pivotally-supported, curved, stop-plate having a plurality of stop-surfaces which act in connection with said

projections to arrest the movement of the carriage at varying distances from a predetermined point, a horizontally and vertically movable key which is pivotally connected with said stop-plate and means operated by said key to effect the release of the carriage from the control of the letter-spacing mechanism.

3. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections to arrest the movement of the carriage at varying distances from a predetermined point, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, springs applied to lift said key and to return the same to its starting position, and means operated by said key to effect the release of the carriage from the control of the letter-spacing mechanism.

4. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable, stepped, stop-plate having a plurality of stop projections which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, a horizontal, vertically-movable bar located in position for actuation by said key, and means operated by said bar to effect the release of the carriage from the control of said letter-spacing mechanism.

5. A tabulating attachment for type-writing machines comprising a rotative disk carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, a horizontal vertically-movable bar adapted for actuation by said key when the same is depressed, a rock-shaft connected with and operated by said bar, a connecting-bar extending from said rock-shaft to the letter-spacing mechanism, and means operated by said connecting-bar for releasing the carriage from the control of the letter-spacing mechanism.

6. A tabulating attachment for type-writing machines comprising a rotative disk carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement

to said stop-plate, a horizontal vertically-movable bar adapted for actuation by said key when the same is depressed, a rock-shaft connected with and operated by said bar, a connecting-bar extending from said rock-shaft to the letter-spacing mechanism, a spring applied to lift said horizontal bar, and means operated by said connecting-bar for releasing the carriage from the control of the letter-spacing mechanism.

7. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, means operated by said key for effecting the release of the carriage from the control of the letter-spacing mechanism, a brake device adapted to control the movement of said rotative disk, and connections between said key and said brake device.

8. A tabulating attachment for type-writing machines comprising a rotative disk carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, a horizontal, vertically-movable bar adapted for actuation by said key when the same is depressed, means operated by said vertically-movable bar for releasing the paper-carriage of the machine from the control of the letter-spacing mechanism, a brake device operating to control the rotative movement of said disk, and a connection between said horizontal bar and the brake device for operating the latter.

9. A tabulating attachment for type-writing machines comprising a rotative disk carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to the stop-plate, a horizontal, vertically-movable bar adapted for actuation by said key when the same is depressed, means operated by said key for effecting the release of said carriage from the control of the letter-spacing mechanism of the machine and a brake device adapted to control the movement of said rotative disk embracing a pivoted lever provided with a spring-arm and means operated by said key and acting on said spring-arm to give movement to said lever.

10. A tabulating attachment for type-writing machines comprising a rotative disk carrying stop projections, a movable, stepped, stop-

plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, a horizontal, vertically-movable bar adapted for actuation by said key when the same is depressed, a rock-shaft connected with and actuated by said bar, and a brake device for controlling the rotative movement of said disk embracing a pivoted lever and a rigid arm on said rock-shaft adapted to act on said lever.

11. A tabulating attachment for type-writing machines comprising a rotative disk carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, a horizontal, vertically-movable bar adapted for actuation by said key when the same is depressed, a rock-shaft connected with and actuated by said bar, a brake device for controlling the rotative movement of said disk embracing a pivoted lever provided with a spring-arm and a rigid arm on said rock-shaft which acts on said spring-arm to operate said lever.

12. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism embracing a rack-bar on the carriage and a pinion movable toward and from the said rack-bar, of a tabulating device comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop-surfaces, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, and a connection between said key and said pinion whereby the latter is shifted out of engagement with the rack-bar when the key is depressed.

13. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism embracing a rack-bar on the carriage and a pinion which is movable toward and from the said rack-bar, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, and a connection between said key and the said pinion embracing a crank-arm which is pivoted to the pinion and adapted for contact with a part on the carriage and an endwise-movable connecting-bar which is actuated by the key and is connected with said crank-arm.

14. The combination with the paper-car-

riage of a type-writing machine and letter-spacing mechanism embracing a rack-bar on the carriage and a pinion which is movable toward and from the said rack-bar, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, and a connection between said key and the said pinion embracing a crank-arm which is pivoted to the pinion and is adapted for contact with a part on the carriage, an endwise-movable connecting-bar connected with and giving movement to said crank-arm, a horizontal, vertically-movable actuating-bar located in position to be acted upon by said key when the same is depressed, a rock-shaft connected with and actuated by the said horizontal bar provided with arms connected with the horizontal bar and with said connecting-bar and a spring applied to move the rock-shaft and connected parts in a direction to lift said horizontal bar.

15. The combination with the paper-carriage of a type-writing machine and letter-spacing mechanism, embracing a rack on the carriage and a pinion which is movable toward and from the rack, of a tabulating attachment comprising a rotative disk having movement corresponding with that of the carriage and carrying stop projections, a movable stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key which is connected with and gives movement to said stop-plate, and a connection between said key and the said pinion embracing a crank-arm which is pivoted to the pinion and adapted for contact with a part on the carriage, an endwise-movable connecting-bar connected with and giving movement to said crank-arm, a horizontal, vertically-movable actuating-bar located in position to be acted upon by said key when the same is depressed, an upright sliding bar to which said horizontal bar is attached, a rock-shaft connected with and actuated by the bar, said rock-shaft being provided with arms connected with the upright bar and with said connecting-bar, and a spring applied to lift said horizontal bar.

16. A tabulating attachment for type-writing machines comprising a horizontal shaft provided with two disks one of which is adapted for connection with the paper-carriage of the machine, and the other of which carries a plurality of stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, and a horizontally and vertically movable key which is connected with and gives movement to said stop-plate.

17. A tabulating attachment for type-writing machines comprising a disk which is connected with and partakes of the movement of the paper-carriage of the machine and which
5 carries a plurality of stop projections, a movable, stepped, stop-plate having a plurality of stop-surfaces which act in connection with said stop projections, a horizontally and vertically movable key-lever which is connected
10 with and gives movement to said stop-plate, and a notched guide-plate the notches of which

are spaced to correspond with the stop-surfaces on the stop-plate and are adapted to receive said key-lever when depressed.

In testimony that I claim the foregoing as
my invention I affix my signature, in presence
of two witnesses, this 14th day of January,
A. D. 1905.

THOMAS OLIVER.

Witnesses:

F. J. SANDERS,

C. D. HURD.