

**No. 754,435.**

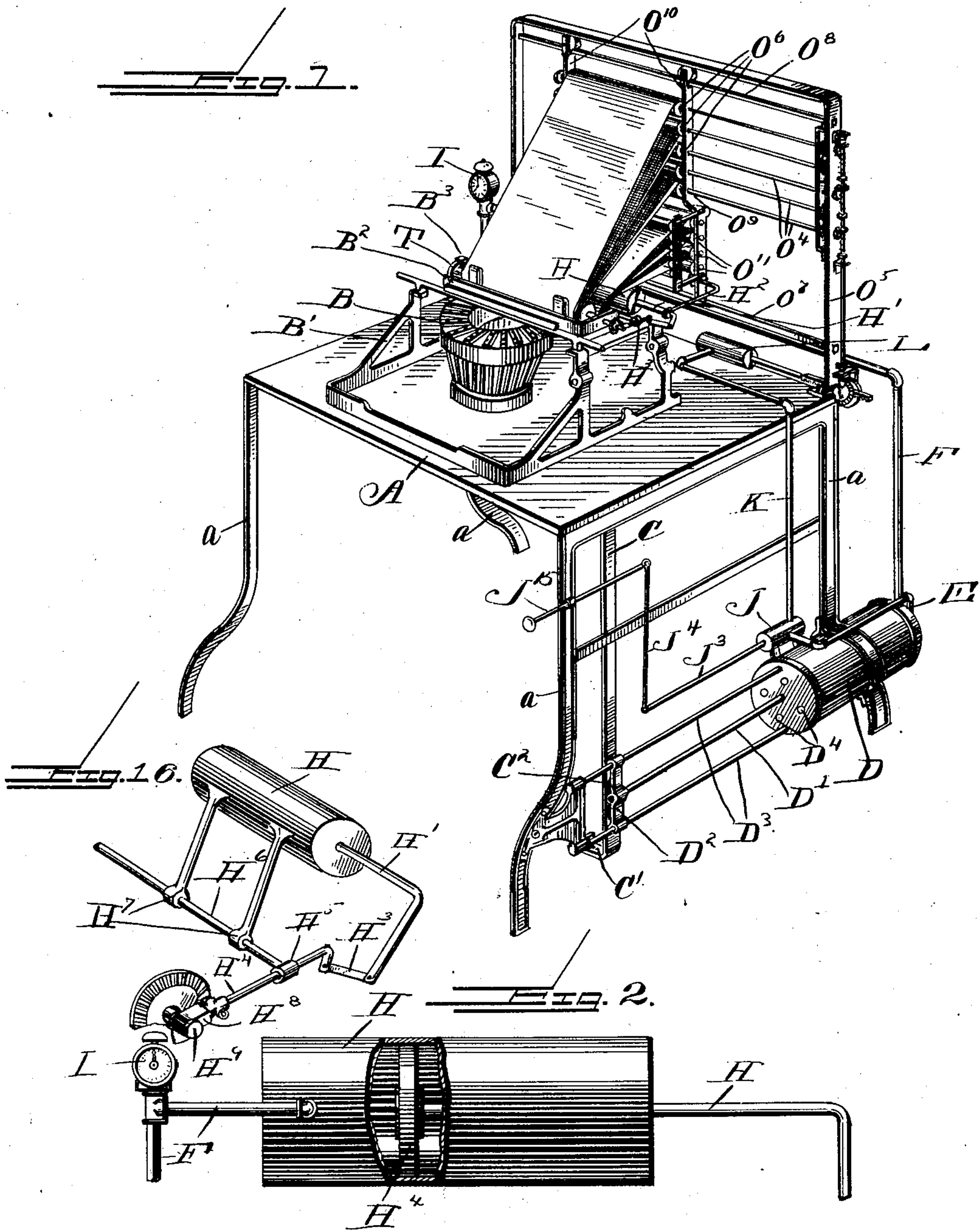
PATENTED MAR. 15, 1904.

D. S. DUFUR.  
FEEDING DEVICE FOR TYPE WRITERS.

APPLICATION FILED JUNE 25, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



WITNESSES

Eugene W. Shively  
Uncle

INVENTOR:

*Douglas S. Dufur,*

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No. 754,435.

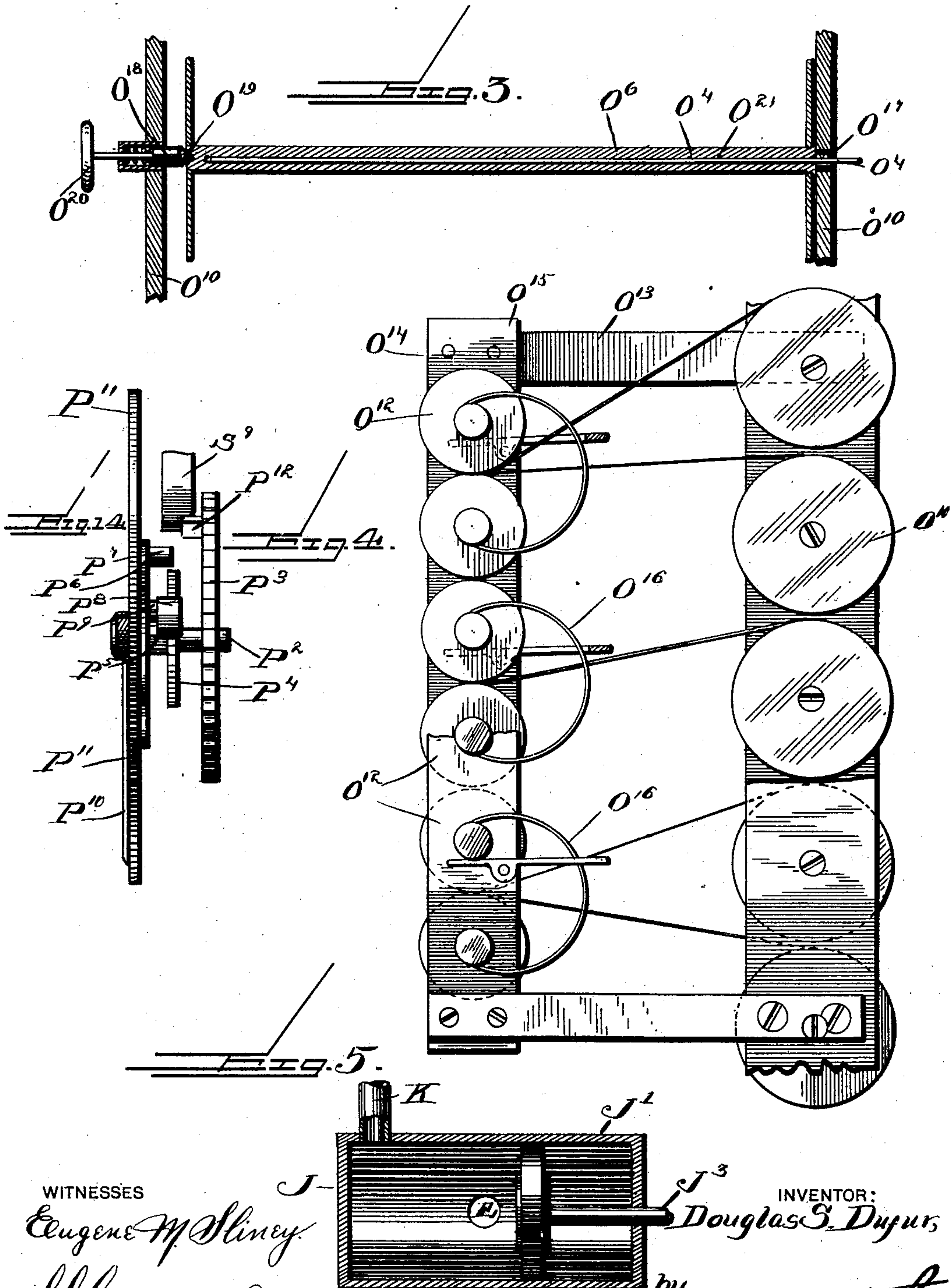
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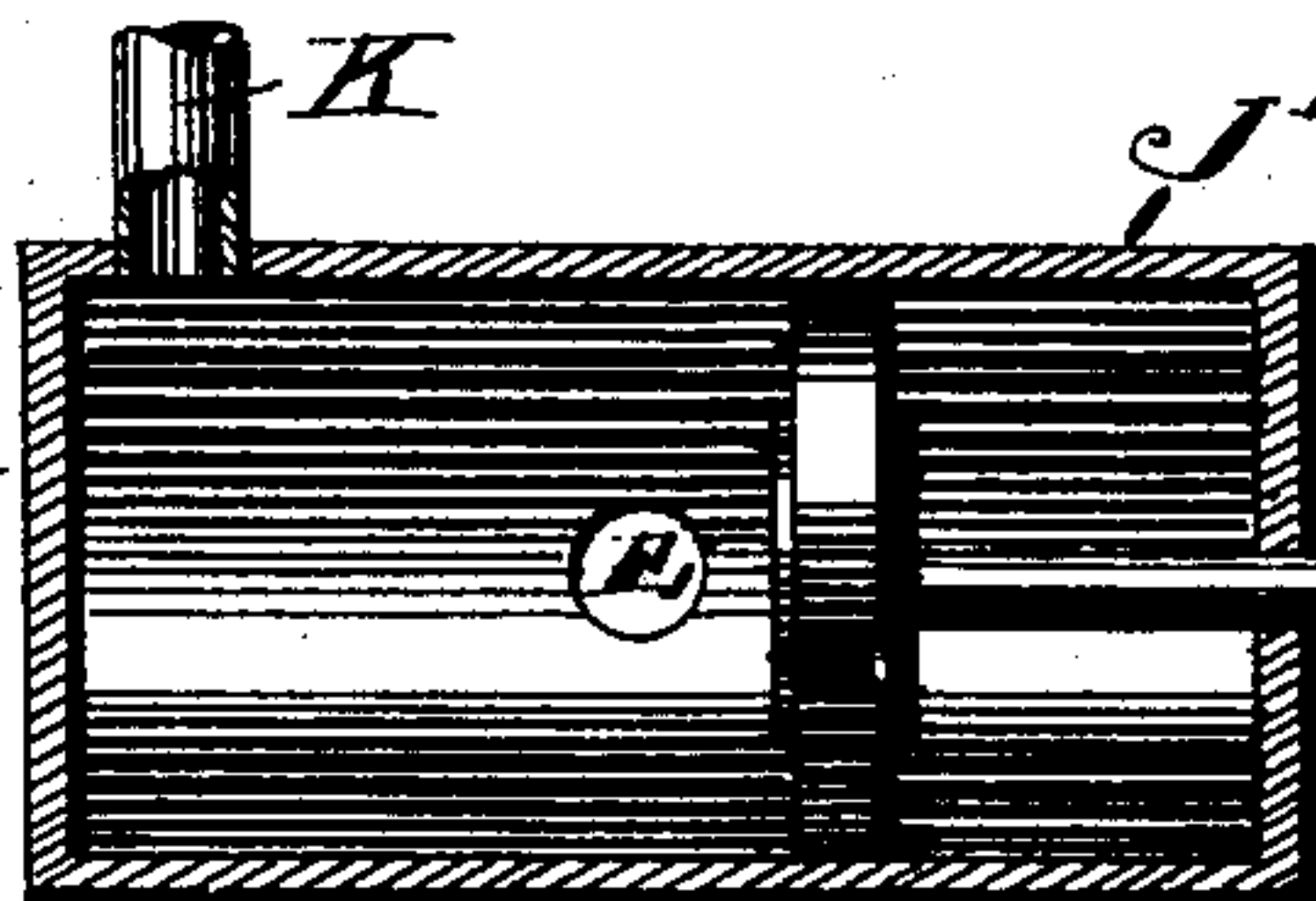
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NO MODEL.

4 SHEETS—SHEET 2.



WITNESSES  
Eugene M. Slincy  
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No. 754,435.

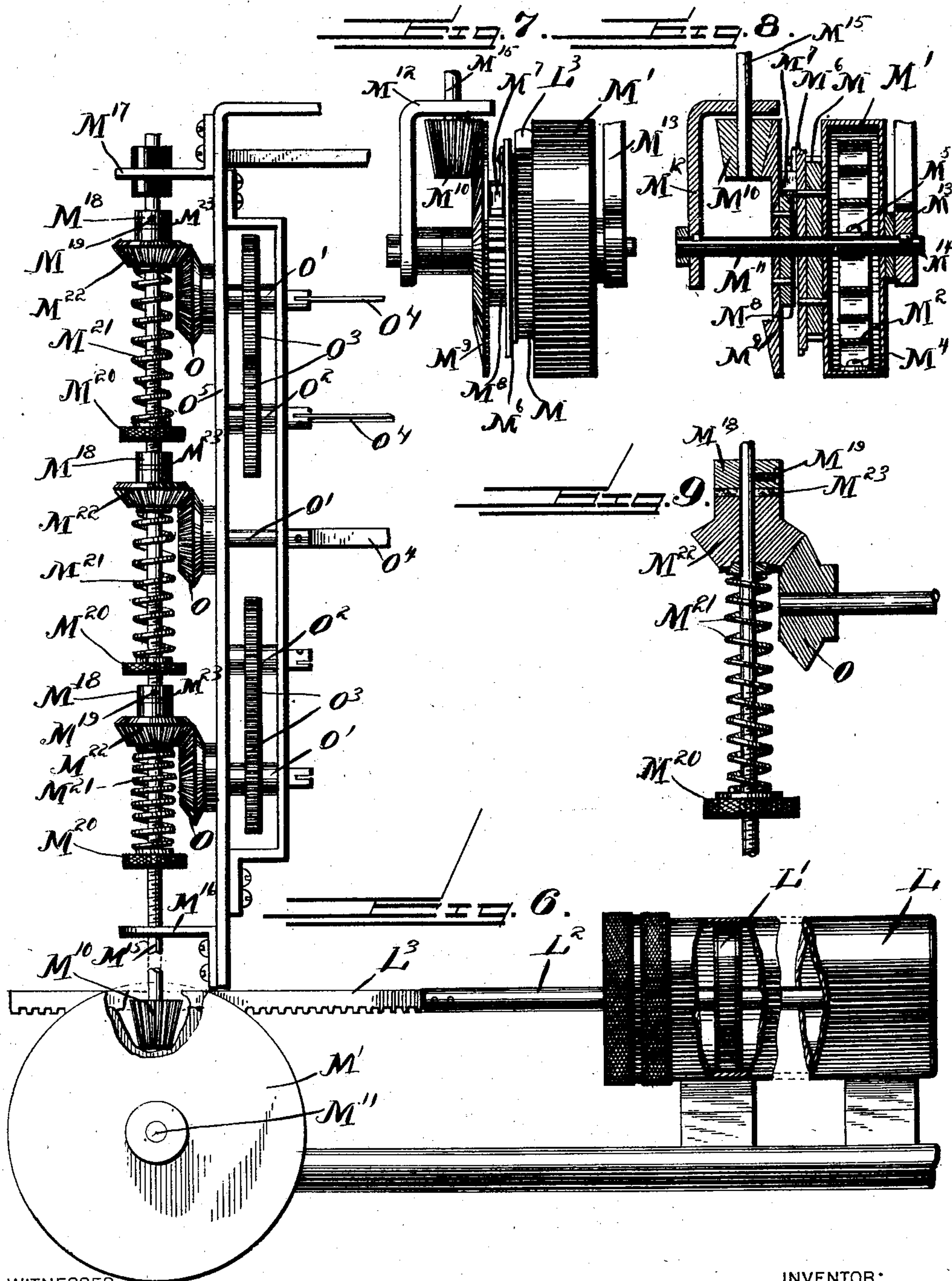
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4 SHEETS—SHEET 3.



WITNESSES

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No. 754,435.

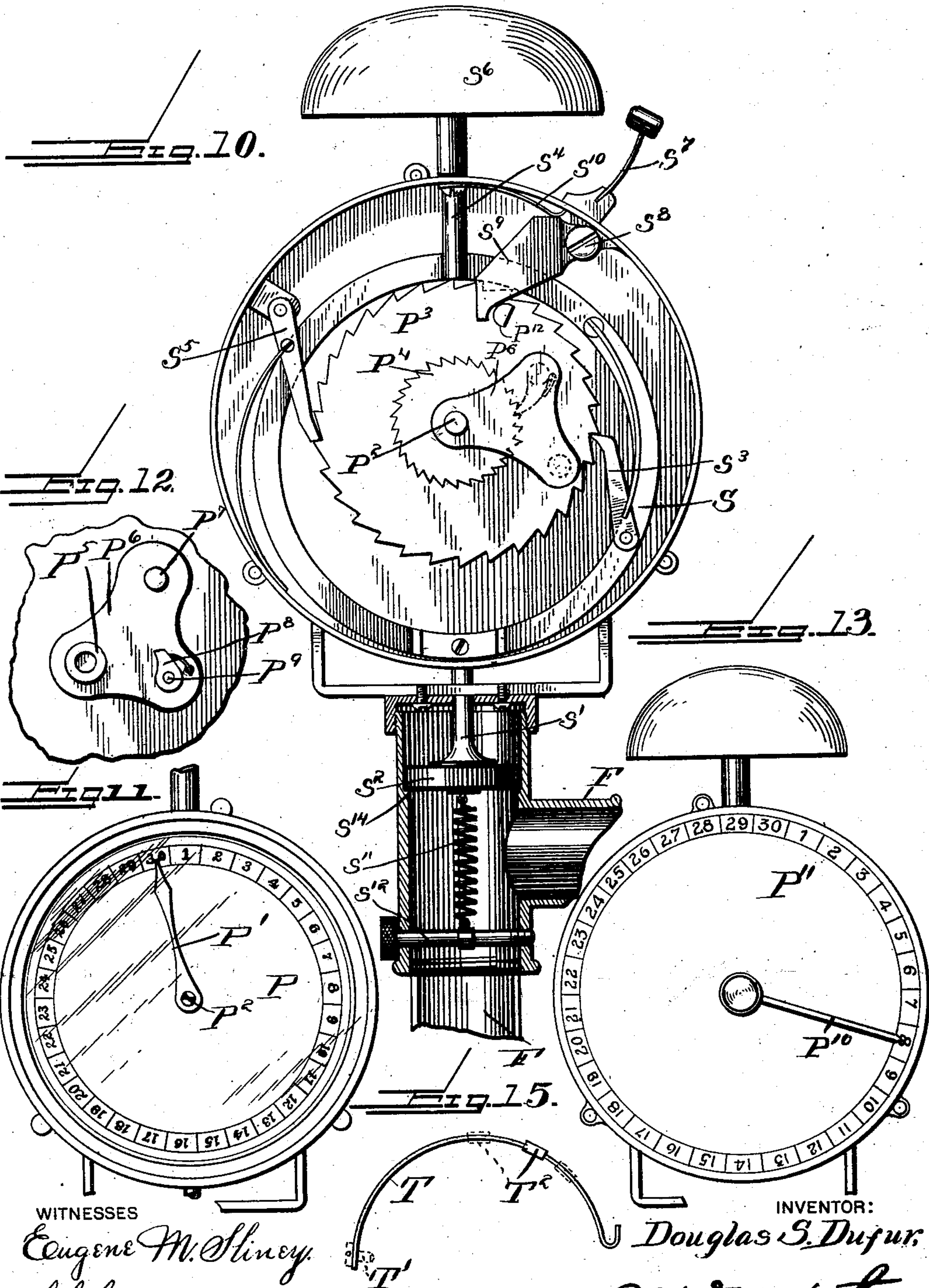
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NO MODEL.

4 SHEETS—SHEET 4.



WITNESSES  
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J. Cousins

INVENTOR:  
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by R. E. Symonds,  
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# UNITED STATES PATENT OFFICE.

DOUGLAS S. DUFUR, OF THE DALLES, OREGON.

## FEEDING DEVICE FOR TYPE-WRITERS.

SPECIFICATION forming part of Letters Patent No. 754,435, dated March 15, 1904.

Application filed June 25, 1903. Serial No. 163,055. (No model.)

*To all whom it may concern:*

Be it known that I, DOUGLAS S. DUFUR, a citizen of the United States, residing at The Dalles, in the county of Wasco and State of Oregon, have invented certain new and useful Improvements in Feeding Devices for Type-Writers; 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 appertains to make and use the same.

The object of my invention is to provide a continuous-length paper feeding and taking-off mechanism.

A further object of my invention is to provide a line-number and sheet-length indicating and alarm device and a slide-scale for measuring any margin desired at the top or other part of each sheet.

While of more general application, my invention is here shown as particularly applicable to type-writing apparatus.

To these ends my invention consists in the construction, combination, and arrangement of parts hereinafter described and claimed.

Referring to the drawings forming a part of this application and in which similar reference-letters indicate corresponding parts in the several views, Figure 1 is a perspective view showing my invention applied to a type-writing machine. Fig. 2 is an elevation, on a larger scale, of the pneumatic means for actuating the type-writer carriage, the paper-reels, and the indicating device. Fig. 3 is an axial sectional view of one of the take-off reels. Fig. 4 is an end elevation, partly broken away, showing the arrangement of the guide and tension rolls. Fig. 5 is a central vertical section showing the piston-valve and its connections. Fig. 6 is a rear elevation, partly broken away, showing the mechanism for rotating the take-off reels. Figs. 7, 8, and 9 are detail views of the mechanism shown in Fig. 6. Fig. 10 is a rear view of the indicating and alarm device with the back cover-plate removed and the pneumatic actuating device shown in section. Fig. 11 is a front elevation of the indicator-dial. Fig. 12 shows an adjustable device which can be set to actuate the alarm at any desired point. Fig. 13

is a rear elevation of the indicating and alarm device. Fig. 14 is a detail view showing in side elevation the relative position of certain elements of the indicating and alarm device, and Fig. 15 is a side view of a slide-scale for measuring the margin desired at the top of a sheet. Fig. 16 is a detail view of the carriage-actuating means.

Referring particularly to Fig. 1, A represents a base having suitable supports *a a*. B is a conventional representation of a type-writer, the keyboard and certain details being omitted for clearness. Upon the type-writer frame B' is supported the usual carriage B<sup>2</sup>, carrying the platen B<sup>3</sup>. Pivoted to the under side of the base A is a swinging arm C, provided at its lower end with a stirrup C'. A single-acting pneumatic cylinder D, conveniently attached to one of the supports *a*, is provided with the usual piston and piston-rod D'. The forward cylinder-head may be provided with apertures D<sup>4</sup> and any well-known form of valved piston employed. The outer end of piston-rod D' carries a cross-head D<sup>2</sup>, arranged to travel on the guides D<sup>3</sup>, as clearly shown in Fig. 1. The swinging arm C is operatively connected to the cross-head by the slot C<sup>2</sup> in said swinging arm, which encompasses a pin on the cross-head. Through the rear head of cylinder D are tapped the pipes E and F. The pipe F is open to the indicator I and to a pneumatic cylinder H, supported on the type-writer frame B', and the pipe E communicates with the piston-valve J, as shown especially in Figs. 1, 2, 5, and 10. A pipe K establishes free communication between the piston-valve J and a cylinder L, carried by the base A for actuating the rotating mechanism of the take-off reels. As shown in Fig. 5, the piston-valve J embodies the cylinder J', piston J<sup>2</sup>, piston-rod J<sup>3</sup>, an inlet E, and an outlet K. In the position shown the pipes E and K are in communication; but by moving the piston J<sup>2</sup> to a position intermediate the pipes E and K communication between said pipes will be interrupted.

Referring now especially to Figs. 1, 6, 7, 8, and 9, the cylinder L is provided with a piston L' and piston-rod L<sup>2</sup>, carrying a rack L<sup>3</sup>. The rack L<sup>3</sup> is guided in constant mesh with



a pinion M, which pinion, together with its retaining-plate M<sup>6</sup>, is rigidly secured to the barrel M'. The barrel and attached pinion are loosely mounted on a shaft M<sup>11</sup>, which is  
 5 held from turning in its bearings M<sup>12</sup> M<sup>13</sup> by any suitable means, as a key M<sup>14</sup>. The barrel incloses a spiral spring M<sup>2</sup>, one end of which is secured to the barrel at M<sup>4</sup> and the other end connected to the shaft M<sup>11</sup> at M<sup>5</sup>. A  
 10 ratchet-wheel M<sup>8</sup> and bevel-gear M<sup>9</sup> are rigidly secured together and loosely mounted on the shaft M<sup>11</sup>. A pawl M<sup>7</sup>, pivotally secured to the retaining-plate M<sup>6</sup>, engages ratchet-wheel M<sup>8</sup> upon the rotation of the barrel M'  
 15 by the spring M<sup>2</sup>, but slides over said ratchet-wheel on the reverse motion of said barrel during the winding up of the spring M<sup>2</sup>. A bevel-pinion M<sup>10</sup> is secured to a shaft M<sup>15</sup> in mesh with the bevel-gear M<sup>9</sup>. The shaft M<sup>15</sup>  
 20 is rotatably supported in brackets M<sup>16</sup> M<sup>17</sup> and carries a suitable number of disks M<sup>18</sup>, rigidly secured thereto, as by pins M<sup>19</sup>. Knurled nuts M<sup>20</sup> are threaded on shaft M<sup>15</sup> adjacent to the disks M<sup>18</sup> for confining one end of  
 25 springs M<sup>21</sup> and adjusting the tension of said springs. The other ends of the springs M<sup>21</sup> bear against bevel-pinions M<sup>22</sup>, loosely mounted on the shaft M<sup>15</sup>. Interposed between the disks M<sup>18</sup> and bevel-pinions M<sup>22</sup> are friction-  
 30 disks M<sup>23</sup>, preferably of leather, against which the bevel-pinions are held with a pressure regulated by the tension of springs M<sup>21</sup>. Meshing with each bevel-pinion M<sup>22</sup> is a bevel-pin-  
 35 ion O, secured to a short shaft O', journaled in a bracket O<sup>5</sup>. A plurality of shafts O<sup>2</sup> are journaled in the bracket O<sup>5</sup> and arranged parallel to the shafts O', with which they are oper-  
 40 atively connected by intermeshing gears O<sup>3</sup>. Each of the shafts O' O<sup>2</sup> carries means O<sup>4</sup>, preferably a flat bar, for supporting and rotating the take-off reels O<sup>6</sup>. The bracket O<sup>5</sup> is provided with guide-rails O<sup>7</sup> and O<sup>8</sup> for the  
 45 traveling carriage O<sup>9</sup>. The traveling carriage comprises two end members O<sup>10</sup>, between the lower portions of which are carried the feed-reels O<sup>11</sup>. A bracket O<sup>13</sup> is secured to traveling carriage O<sup>9</sup> adjacent to the feed-  
 50 reels O<sup>11</sup>. This bracket is provided with members O<sup>14</sup>, having slots O<sup>15</sup> arranged to receive the end journals of a plurality of tension and guide rolls O<sup>12</sup>. Springs O<sup>16</sup> are shown embracing the end journals of the tension-rolls  
 55 O<sup>12</sup> for maintaining the periphery of such rolls in yielding contact. The take-off reels O<sup>6</sup> are preferably arranged in the upper portion of the traveling carriage O<sup>9</sup> and are supported at their left-hand ends by spring-pressed pins  
 60 O<sup>18</sup>, shaped to fit sockets O<sup>19</sup> in said rolls. Each reel O<sup>6</sup> is provided with an axial bore O<sup>21</sup>, into which fits one of the flat bars O<sup>4</sup>, the reel being arranged to slide longitudinally on  
 65 such openings being sufficiently large to per-

mit free movement of the bars therein. A rod H<sup>2</sup> connects the traveling carriage O<sup>9</sup> with the piston-rod H' of pneumatic cylinder H. The piston-rod H' is also connected by a resilient link H<sup>3</sup> to a shaft H<sup>4</sup>, which is  
 70 journaled in a bearing H<sup>5</sup>; carried by a rod H<sup>6</sup>, mounted to slide in the supports H<sup>7</sup>. The end of said shaft is also journaled in a bearing H<sup>8</sup>, which is supported on a pivot H<sup>9</sup>, arranged on the carriage axially with relation  
 75 to the type-writer platen. The shaft H<sup>4</sup> is shown carrying a pawl H<sup>10</sup>, which is constructed to rotate the type-writer platen for line-spacing; but this construction constitutes no part of applicant's invention as claimed in  
 80 this application and need not be further described.

Referring especially to Figs. 10, 11, 12, 13, and 14, the indicating and alarm device I is provided with a front dial P, having any de-  
 85 sired number of divisions and a pointer P'. The pointer P' and the ratchet-wheels P<sup>3</sup> P<sup>4</sup> are rigidly secured to a central spindle P<sup>2</sup>, and said spindle extends beyond the rear of ratchet-wheel P<sup>4</sup> sufficiently to receive the boss P<sup>5</sup> of  
 90 the adjustable part P<sup>6</sup>, as clearly shown. The adjustable part is provided with a tappet P<sup>7</sup> and carries a pawl P<sup>8</sup>, pivoted to it at P<sup>9</sup>, and adapted for engagement with ratchet-wheel P<sup>4</sup>. An extension of boss P<sup>5</sup> is mounted to  
 95 turn in the rear cover-plate P<sup>11</sup>, and an auxiliary pointer P<sup>10</sup> is secured to said boss adjacent the rear side of said cover-plate. A yoke S is carried by the piston-rod S' of a piston  
 100 S<sup>2</sup> and is provided with a guide-lug S<sup>4</sup>. A spring-pressed pawl S<sup>3</sup> is secured to yoke S in position to engage ratchet-wheel P<sup>3</sup>. A spring-pressed detent S<sup>5</sup> is pivoted to the indicator-frame and also engages ratchet-wheel P<sup>3</sup>. An  
 105 alarm-bell S<sup>6</sup> is mounted above the indicator, and a hammer S<sup>7</sup> is pivotally connected at S<sup>8</sup> to the indicator-frame in operative position with said bell. The lower portion of said hammer constitutes a pendulous latch S<sup>9</sup>, which  
 110 is arranged to be engaged by the tappet P<sup>7</sup> or by a tappet P<sup>12</sup> on ratchet-wheel P<sup>3</sup>. The latch S<sup>9</sup> is provided with a shoulder adapted to compress a spring S<sup>10</sup> to augment the striking effect of the hammer. The downward move-  
 115 ment of piston S<sup>2</sup> may be effected by gravity or by a spring S<sup>11</sup>, secured to said piston and to a pin S<sup>12</sup>. Such downward motion of the piston may be limited by a shoulder S<sup>14</sup>. A slide-scale T is secured to the type-writer car-  
 120 riage by a screw T' and is shaped to approximately follow the periphery of the type-writer platen. This scale is provided with divisions corresponding to line-spaces and carries an adjustable slide member T<sup>2</sup>. When using the  
 125 slide-scale, the slide T<sup>2</sup> is set at that numbered division corresponding to the number of line-spaces which it is desired to leave as a margin at the top of a sheet. When the indicating and alarm device indicates that the last line  
 130 on a sheet has been written, the type-writer



platen is rotated to bring such last-written line up to said slide T<sup>2</sup>, thus securing the desired space between the last-written line and the first line of the following sheet.

5 The operation of my apparatus is as follows: Feed-reels O<sup>11</sup>, containing rolls of paper and transfer-paper, are placed in the lower portion of traveling carriage O<sup>9</sup> and arranged to secure a sheet of transfer-paper interposed  
10 between adjacent sheets of paper. The several sheets are then led between the guide and tension rolls, the sheet from the bottom reel being led between the first and second tension-rolls from the bottom, the sheet from the second  
15 reel from the bottom being led between the second and third tension-rolls, &c., as shown in Figs. 1 and 4. The tension-rolls prevent slack in the paper-supply and insure an even unwinding of the feed-reels O<sup>11</sup>. The sheets are  
20 then carried between the usual platen and pressure-roll of the type-writer, partly around the platen, and finally to the take-off reels O<sup>6</sup>, as shown in Fig. 1. The operator then slides the platen, together with the attached traveling  
25 carriage O<sup>9</sup>, to proper position and writes the first line of type-writing in the usual manner. After a line of desired length has been type-written the operator actuates the swinging arm C with his foot to temporarily compress air in  
30 the rear end of cylinder D. Through the pipe F pressure is communicated from cylinder D to the pistons H<sup>4</sup> and S<sup>2</sup>. This pressure forces the piston H<sup>4</sup> to the right, carrying with it the type-writer platen and the traveling carriage O<sup>9</sup>, thus bringing them into proper position for the operator to start on the next  
35 line of type-writing. This movement of piston H<sup>4</sup> also turns the type-writer platen for line-spacing by means of connecting mechanism H<sup>3</sup>; but as this mechanism is claimed in a copending application, Serial No. 145,607, and forms no part of the invention claimed herein it need not be further described. These steps are repeated until the end of the  
45 sheet is reached, when the operator turns the type-writer platen by hand sufficiently to provide for the desired margin at the top of the following sheet. The margin is measured by the sliding scale T, as hereinbefore described.  
50 Before beginning to write, the operator sets pointer P' to the division numbered "1" on the dial P, and each time air is compressed in the cylinder D to return the type-writer platen into position for beginning a new line the pressure communicated through pipe F to piston S<sup>2</sup> will actuate said piston and its attached yoke S, thereby rotating the ratchet-wheel P<sup>3</sup> sufficiently to move the pointer P' to the next higher division on dial P. When  
60 the pointer P' reaches the highest division on dial P, the tappet P<sup>12</sup> will trip latch S<sup>9</sup> and ring the alarm-bell S<sup>6</sup>. If it is desired to have the alarm-bell sounded after any particular number of lines have been type-written, the  
65 pointer P<sup>10</sup> is set to the correspondingly-num-

bered division on the back cover-plate P<sup>11</sup>, which will bring the tappet P<sup>7</sup> into position to trip the latch S<sup>9</sup> at the desired point. The piston-valve is normally set to permit communication between the pipes E and K, as  
70 shown in Fig. 5, thus causing the piston L' to be actuated each time air is compressed in cylinder D. Each time the piston L' is so actuated it forces forward the rack L<sup>3</sup> and places spring M<sup>2</sup> under tension, and upon the relief  
75 of pressure in cylinder D the spring M<sup>2</sup> unwinds, thereby returning the rack L<sup>3</sup> and piston L' to their initial position, ready to be again actuated by compression of air in cylinder D. The spring in unwinding rotates  
80 the shaft M<sup>15</sup> through the intermediary of pawl M<sup>7</sup>, ratchet M<sup>8</sup>, and bevel-gears M<sup>9</sup> M<sup>10</sup>, as hereinbefore described. Such rotation of shaft M<sup>15</sup> tends to rotate the bevel-gears M<sup>22</sup>, held by springs M<sup>21</sup> against friction-disks M<sup>23</sup> of said shaft, and thus to wind  
85 up the paper on the take-off reels supported on flat bars O<sup>4</sup>. Should, however, the resistance of any take-up reel become abnormal, the corresponding bevel-gear M<sup>22</sup> will slip  
90 against its friction-disk, and thus prevent any tearing or injury of the paper.

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

1. An attachment for type-writing machines, comprising a frame, a traveling carriage, paper-roll supports on said carriage for the supply and take-off, pneumatic means connected and arranged to actuate said carriage,  
100 and pneumatic means carried by said frame and connected and arranged to actuate said paper-roll supports, substantially as described.

2. An attachment for type-writing machines, comprising a frame, a traveling carriage, paper-roll supports on said carriage for the supply and take-off, means connected to actuate the carriage, means carried by said frame and constructed to actuate the take-off supports, and a common operating means connected to operate each of said actuating means,  
110 substantially as described.

3. An attachment for type-writing machines, comprising a frame, a traveling carriage, paper-roll supports on said carriage for the supply and take-off, tension-rolls on said carriage, means connected to actuate the carriage, means carried by said frame and constructed to actuate the take-off supports, and a common operating means connected to operate each of said actuating means, substantially as described.

4. An attachment for type-writing machines, comprising a frame, a traveling carriage, paper-roll supports on said carriage for the supply and take-off, tension-rolls on said carriage, and pneumatic means carried by said frame and connected to actuate the take-off supports, substantially as described.

5. An attachment for type-writing ma- 130



chines, comprising a frame, paper-roll supports for the supply and take-off rotatably supported on said frame, but held from longitudinal movement, a carriage arranged to travel in said frame along said paper-roll supports, reels removably supported through a portion of their length on said supports and constructed to rotate therewith and to slide longitudinally thereon, and detachable supports on said carriage arranged to engage the unsupported ends of said reels, substantially as described.

6. An attachment for type-writing machines, comprising a frame, a traveling carriage, paper-roll supports on said carriage for the supply and take-off, a line-space-indicating device, means connected and arranged to actuate said carriage, independent means connected and arranged to actuate said indicating device, and a common operating means connected and constructed to operate each of said actuating means, substantially as described.

7. An attachment for type-writing machines comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, said take-off supports comprising flat bars journaled in said frame, but held from longitudinal movement, openings in one member of said carriage through which the bars extend, reels provided with axial bores of approximately the same cross-section as that of said flat bars, whereby said reels may be removably supported on said bars to rotate therewith and slide longitudinally thereon, detachable supports on said carriage arranged to engage said reels, and means for rotating said flat bars, substantially as described.

8. An attachment for type-writing machines comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, means for actuating said carriage, means for actuating said take-off supports, a line-space-indicating device, and a common means arranged to operate the actuating means of the carriage, the take-off supports, and the indicating device, substantially as described.

9. An attachment for type-writing machines, comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, pneumatic means arranged to actuate said carriage, pneumatic means arranged to operate said take-off supports, a line-space-indicating device, pneumatic means arranged to operate said indicating device, a pneumatic compressor, and connections from said compressor to the pneumatic actuating means of the carriage, the take-off supports, and the indicating device, whereby said several actuating means are operated in common from said compressor, substantially as described.

10. An attachment for type-writing ma-

chines comprising a frame, a traveling carriage, paper-roll supports for the supply and take-off, a line-space-indicating device, and pneumatic means for actuating said carriage and indicating device, substantially as described.

11. An attachment for type-writing machines comprising a frame, a traveling carriage, paper-roll supports on said carriage for the supply and take-off, a line-space-indicating device, a slide-scale arranged for measuring the number of line-spaces to be left blank on any portion of the paper, and means for actuating said carriage and indicating device, substantially as described.

12. An attachment for type-writing machines comprising a frame, a traveling carriage, paper-roll supports on said carriage for the supply and take-off, a line-space-indicating device, a slide-scale arranged for measuring the number of line-spaces to be left blank on any portion of the paper, means for actuating said carriage, and independent means for actuating said indicating device, said actuating means being arranged and connected for simultaneous operation, substantially as described.

13. An attachment for type-writing machines comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, and pneumatic means carried by said frame for actuating the take-off supports, substantially as described.

14. An attachment for type-writing machines, comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, bevel-gears secured on the contiguous ends of said take-off supports, a shaft journaled in the frame, a plurality of friction-disks carried by said shaft, a series of bevel-gears loosely mounted on said shaft adjacent the friction-disks and arranged in mesh with the bevel-gears on the take-off supports, springs for yieldingly holding said second bevel-gears against the friction-disks, adjustable members arranged to regulate the tension of said springs, and means for rotating said shaft, substantially as described.

15. An attachment for type-writing machines, comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, bevel-gears secured on the contiguous ends of said take-off supports, a shaft journaled in the frame, a plurality of friction-disks carried by said shaft, a series of bevel-gears loosely mounted on said shaft adjacent the friction-disks and arranged in mesh with the bevel-gears on the take-off supports, springs for yieldingly holding said second bevel-gears against the friction-disks, adjustable members arranged to regulate the tension of said



springs, and pneumatically-actuated means for rotating said shaft, substantially as described.

16. An attachment for type-writing machines, comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, bevel-gears secured on the contiguous ends of said take-off supports, a shaft journaled in the frame, a plurality of friction-disks carried by said shaft, a series of bevel-gears loosely mounted on said shaft adjacent the friction-disks and arranged in mesh with the bevel-gears on the take-off supports, springs for yieldingly holding said second bevel-gears against the friction-disks, adjustable members arranged to regulate the tension of said springs, a pinion on said shaft, a gear arranged in mesh with said pinion, a ratchet-wheel carried by said gear, a stationary shaft on which said gear is loosely mounted, a barrel mounted to turn on the stationary shaft, a spring arranged with one end secured to said barrel and the other end secured to the stationary shaft, a gear carried by said barrel and provided with a pawl engaging with said ratchet-wheel, a rack arranged in mesh with said last-mentioned gear, and means for actuating said rack, substantially as described.

17. An attachment for type-writing machines, comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, bevel-gears secured on the contiguous ends of said take-off supports, a shaft journaled in the frame, a plurality of friction-disks carried by said shaft, a series of bevel-gears loosely mounted on said shaft adjacent the friction-disks and arranged in mesh with the bevel-gears on the take-off supports, springs for yieldingly holding said second bevel-gears against the friction-disks, adjustable members arranged to regulate the tension of said springs, a pinion on said shaft, a gear arranged in mesh with said pinion, a ratchet-wheel carried by said gear, a stationary shaft on which said gear is loosely mounted, a barrel mounted to turn on the stationary shaft, a spring arranged with one end secured to said barrel and the other end secured to the stationary shaft, a gear carried by said barrel and provided with a pawl engaging with said ratchet-wheel, a pneumatic cylinder having a piston and piston-rod, and a rack carried by said piston-rod and guided in mesh with said barrel-gear, whereby, upon the admission of pressure in the pneumatic cylinder, the rack will operate to place the barrel-spring under tension, and, upon the release of pressure in the pneumatic cylinder, said spring will act to rotate said pinion-carrying shaft and to return the rack to its initial position, substantially as described.

18. An attachment for type-writing machines, comprising a frame, a carriage arranged

to travel in said frame, paper-roll supports on said carriage for the supply and take-off, bevel-gears on the contiguous ends of certain of said take-off supports, spur-gears secured to the take-off supports which are so provided with bevel-gears, spur-gears on certain other of the take-off supports and arranged in mesh with said first-mentioned spur-gear, bevel-gears arranged in mesh with the bevel-gears on the take-off supports, and means for rotating said second bevel-gears, substantially as described.

19. An attachment for type-writing machines, comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, bevel-gears on the contiguous ends of certain of said take-off supports, spur-gears secured to the take-off supports which are so provided with bevel-gears, spur-gears on certain other of the take-off supports and arranged in mesh with said first-mentioned spur-gear, a shaft journaled in the frame, a plurality of friction-disks carried by said shaft, a series of bevel-gears loosely mounted on said shaft adjacent the friction-disks and arranged in mesh with the bevel-gears on the take-off supports, springs for yieldingly holding said second bevel-gears against the friction-disks, adjustable members arranged to regulate the tension of said springs, and means for rotating said shaft, substantially as described.

20. An attachment for type-writing machines, comprising a paper-supply and take-off, a line-space-indicating and alarm device comprising a visual signal and an alarm device, mechanism arranged to actuate said visual signal, means carried by said mechanism and arranged to operate the alarm at a predetermined position of said signal, means for actuating the paper-supply and take-off, said actuating means being arranged and connected for simultaneous operation, substantially as described.

21. An attachment for type-writing machines, comprising a paper-supply and take-off, a line-space-indicating and alarm device comprising a dial and pointer, a spindle supporting said pointer, two ratchet-wheels secured on said spindle, a rear cover-plate constituting an auxiliary dial, a short shaft rotatably mounted in said cover-plate, an auxiliary pointer secured on the rear end of said shaft, an annular boss formed on the front end of said shaft and arranged to turn on the rear end of said spindle, a plate secured to said shaft adjacent the boss, a pawl carried by said plate and engaging with the rearward of said ratchet-wheel, a tappet carried by said plate, a tappet carried by the forward ratchet-wheel, an alarm-bell and hammer, a latch carried by said hammer and extending in the paths of the two tappets, a reciprocatory member, a pawl carried by said member and engaging said forward ratchet-wheel, means for actuating said reciprocatory member, and means for



actuating the paper-supply and take-off, said actuating means being arranged and connected for simultaneous operation, substantially as described.

5 22. An attachment for type-writing machines, comprising a frame, a carriage arranged to travel in said frame, paper-roll supports on said carriage for the supply and take-off, a line-space indicating and alarm device comprising  
10 a dial and pointer, a spindle supporting said pointer, two ratchet-wheels secured on said spindle, a rear cover-plate constituting an auxiliary dial, a short shaft rotatably mounted in said cover-plate, an auxiliary pointer secured  
15 on the rear end of said shaft, an annular boss formed on the front end of said shaft and arranged to turn on the rear end of said spindle, a plate secured to said shaft adjacent the boss, a pawl carried by said plate and engaging with

the rearward of said ratchet-wheels, a tappet 20 carried by said plate, a tappet carried by the forward ratchet-wheel, an alarm-bell and hammer, a latch carried by said hammer and extending in the paths of the two tappets, a reciprocatory member, a pawl carried by said mem- 25 ber and engaging said forward ratchet-wheel, means for actuating said reciprocatory member, and means for actuating said carriage, said actuating means being arranged and connected for simultaneous operation, substantially as 30 described.

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

DOUGLAS S. DUFUR.

Witnesses:

EDMUND H. PARRY,  
CHAS. F. MICHELBACH.