

No. 873,782.

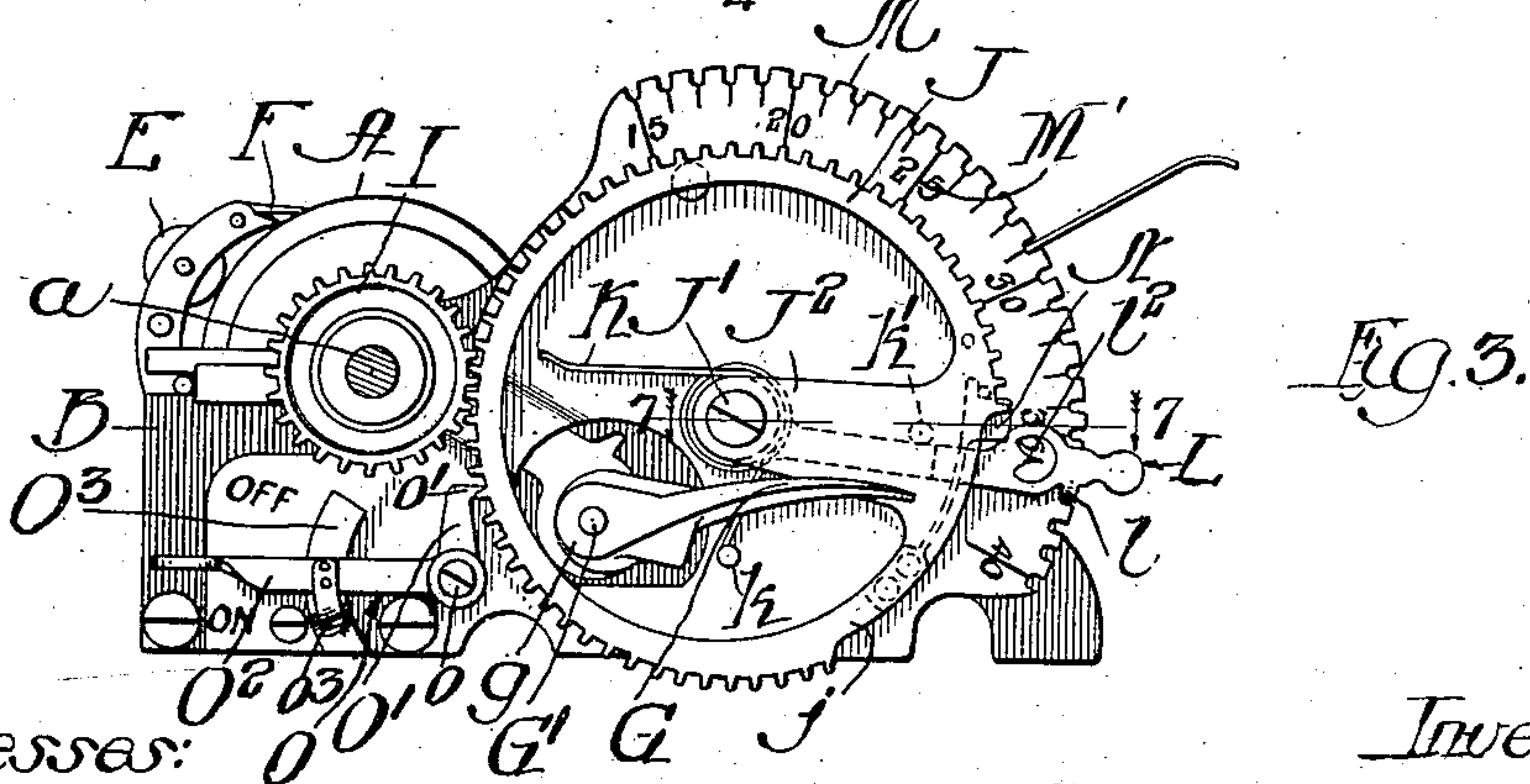
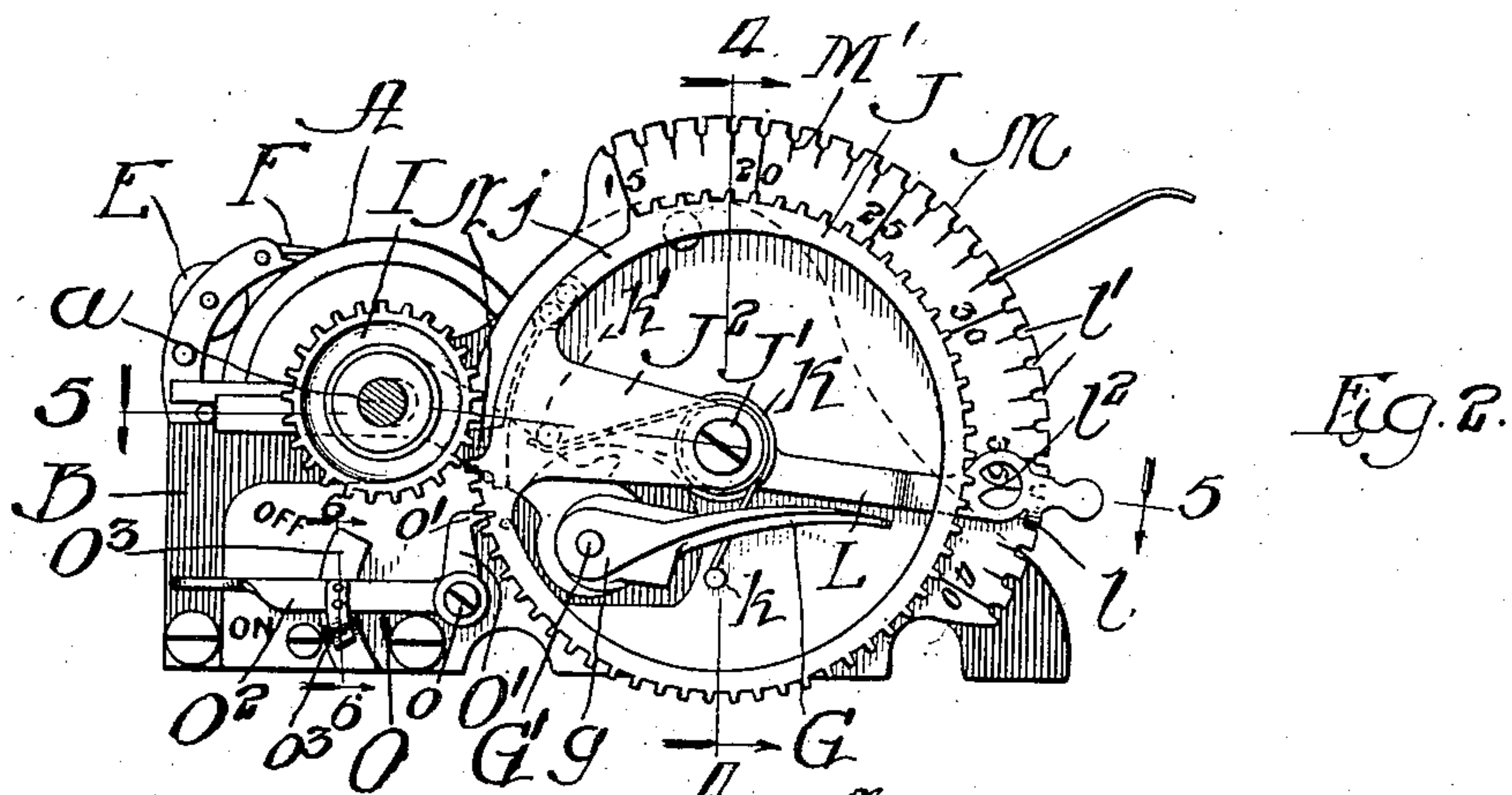
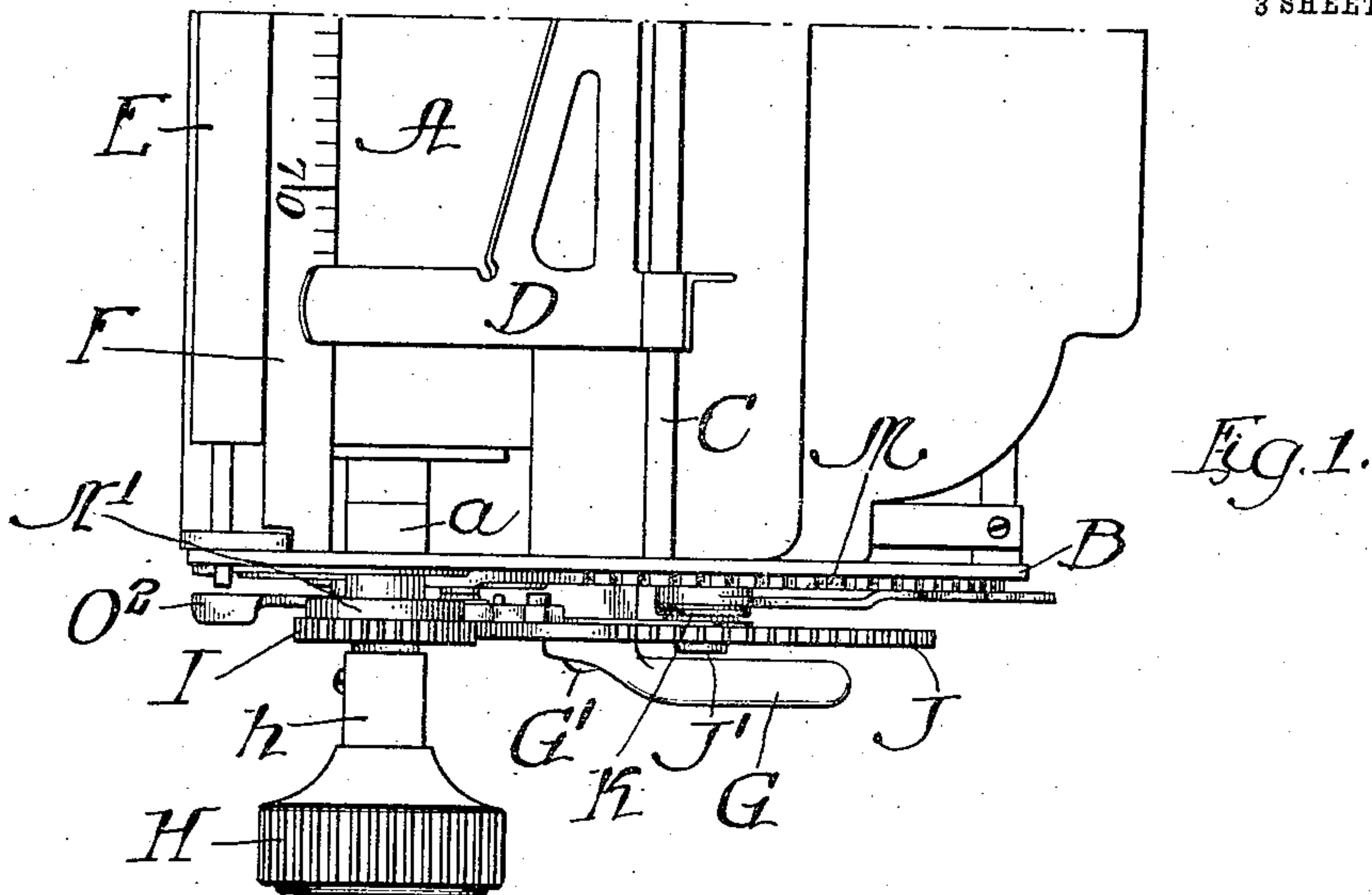
PATENTED DEC. 17, 1907.

C. C. POOLE.

LINE SPACE INDICATING DEVICE.

APPLICATION FILED MAY 3, 1907.

3 SHEETS—SHEET 1.



Witnesses:
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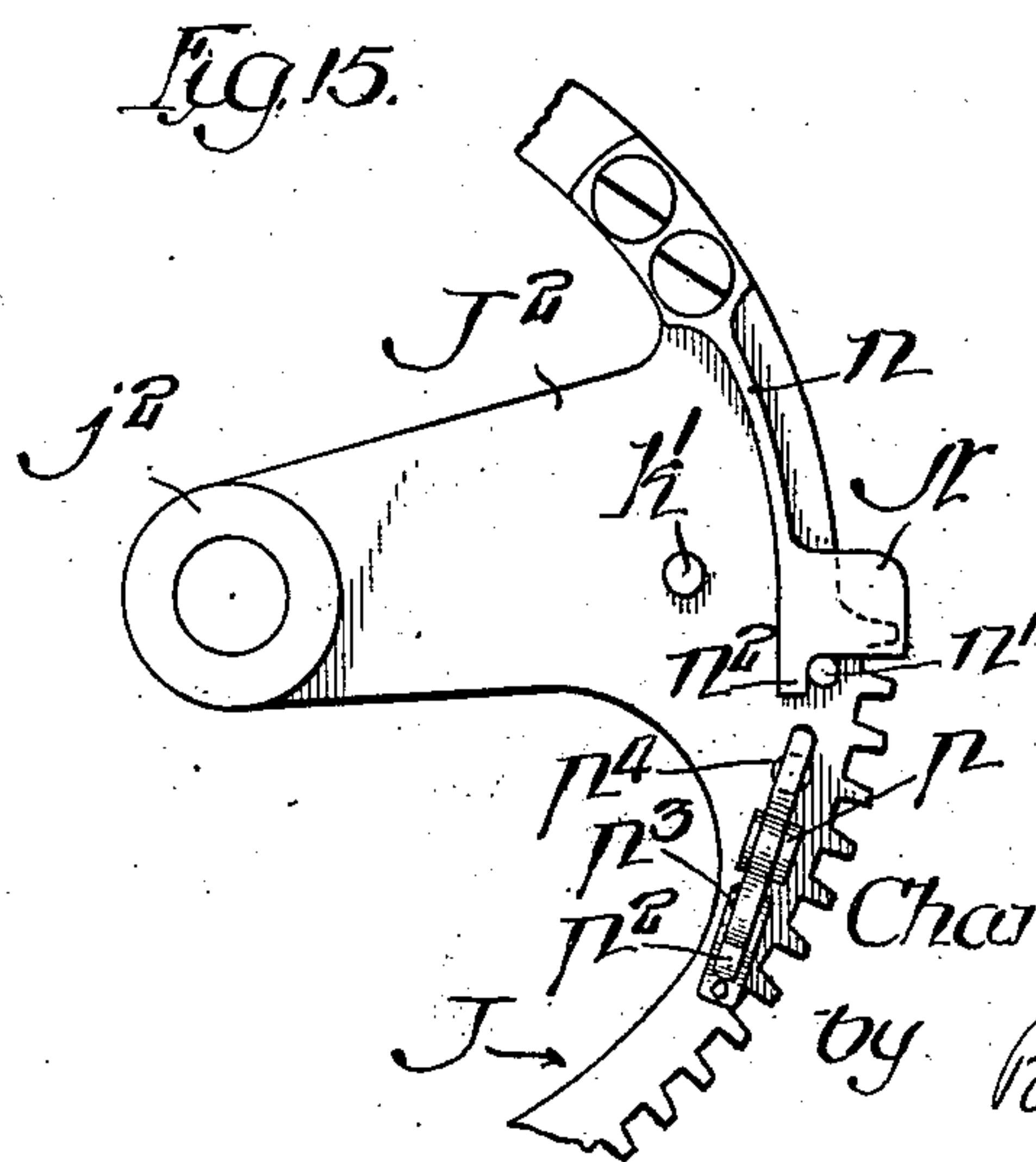
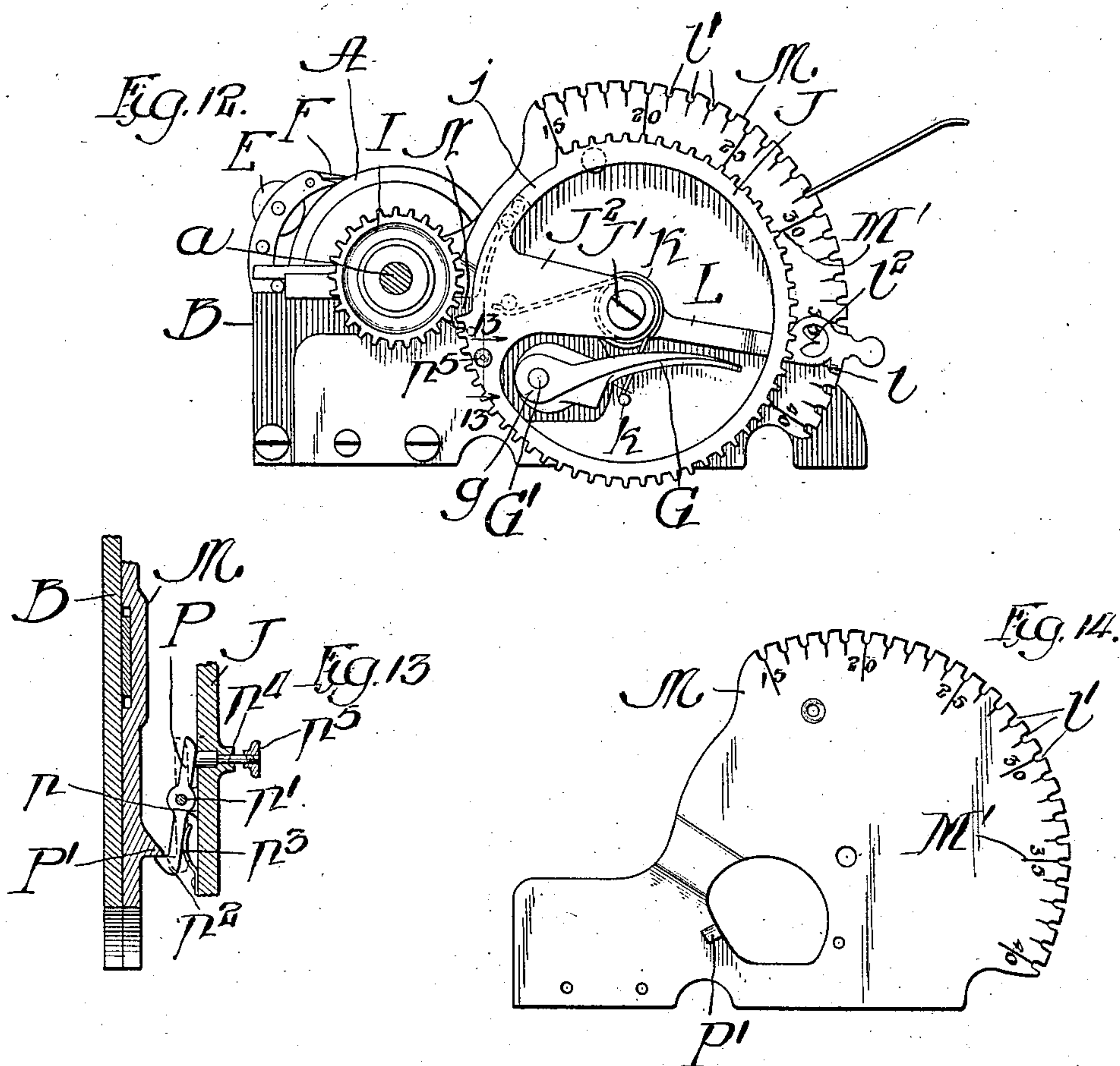
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES CLARENCE POOLE, OF EVANSTON, ILLINOIS, ASSIGNOR TO THE OLIVER TYPE-WRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LINE-SPACE-INDICATING DEVICE.

No. 873,782.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed May 3, 1907. Serial No. 371,587.

To all whom it may concern:

Be it known that I, CHARLES CLARENCE POOLE, a citizen of the United States, and a resident of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Line-Space-Indicating Devices for Type-Writers; 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 a line space indicating device for typewriting machines designed to indicate the extent to which the platen should be turned backwardly by hand for inserting new sheets when making a number of carbon copies of a number of writings, on a single record sheet, with uniform or predetermined spaces between said carbon copies.

The invention consists in the matters hereinafter described and pointed out in the appended claims.

As shown in the accompanying drawings:—
Figure 1 is a plan view of the right hand end of the paper carriage of the kind of machine known as the "Oliver". Fig. 2 is a view in elevation of the said right hand end of the carriage with the devices embodying my invention attached thereto, the turning-knob at the right hand end of the platen being omitted to more clearly show the parts. Fig. 3 is a view similar to Fig. 2 showing the parts in changed position. Fig. 4 is a detail vertical section, taken on the line 4—4 of Fig. 2. Fig. 5 is a horizontal section, on the line 5—5 of Fig. 2. Fig. 6 is a detail vertical section on the line 6—6 of Fig. 2. Fig. 7 is a detail horizontal section, on the line 7—7 of Fig. 3. Fig. 8 is a view in elevation of the base-plate constituting a part of my device. Fig. 9 is a view in elevation of the gear segment constituting part of my device. Fig. 10 is a detail vertical section on the line 10—10 of Fig. 5. Fig. 11 is a view in elevation of the stop-arm constituting a part of my device. Fig. 12 is a view in elevation of the said right hand end of the carriage with a modified form of my device attached thereto, the turning-knob at the right hand end of the platen being omitted to more clearly show the parts. Fig. 13 is a detail vertical

section on the line 13—13 of Fig. 12. Fig. 14 is a view in elevation of the base-plate constituting a part of said modified form of my device, detached from the machine. Fig. 15 is a view in elevation showing a portion of the inner face of the gear segment constituting a part of said modified form of my device.

As shown in the said drawings (Figs. 1 to 11, inclusive) A designates the platen or paper roller, B the right-hand end plate of the paper carriage in which the shaft *a* of the platen has bearing, C the upper longitudinal frame bar of the carriage, D one of the paper guides mounted on said frame bar, E the upper guide roller of the carriage, and F a scale strip located above the platen and adjacent to said guide roller.

G indicates a lever at the right-hand end of the carriage by which are operated devices for moving or shifting the guide rollers toward and from the platen, thereby releasing the paper when desired, said lever having a hub *g* by which it is secured to the end of a rock-shaft *G*¹ which projects through the end plate B.

H designates the right-hand end turning knob of the platen shaft which is affixed to the shaft by a short sleeve *h* that fits over and is attached to the end of said shaft.

The parts above described correspond with those of the paper carriage of an "Oliver" typewriting machine in which the type-bars are located above the platen and the types strike downwardly upon the top surface thereof.

Now referring to the parts more particularly concerned in my invention, the same are constructed as follows: I indicates a gear pinion which is affixed to the platen shaft outside of the end frame plate B of the carriage frame, and J indicates a curved rack member or gear segment mounted on the carriage frame in the same plane with the gear pinion I and adapted to intermesh therewith. As shown in the drawings, said gear segment J forms part of the rim of a gear wheel, the extremities of the gear segment being joined by a connecting part *j* so as to give continuity to the rim of the gear wheel. The gear segment J is supported on a central pivot *J*¹ by means of a single radial arm *J*² formed integral with a hub portion *j*² (Fig. 9).

The pivot stud J^1 is located at the rear of the platen shaft and above and at the rear of the rock-shaft G^1 on which the lever G is mounted, the parts being so arranged that the gear segment swings in a path outside of said rock-shaft G^1 relatively to the pivotal axis of the gear segment. The open construction afforded by the employment of a single arm for supporting the gear segment enables the latter to swing through a desired distance or arc without contact with the hub g by which said lever G is attached to the rock-shaft G^1 .

In one position of the parts, shown in Fig. 2, the teeth on the gear segment are out of mesh with the teeth on the pinion I . In such position a spring K , coiled about the hub of the gear segment and engaging at its ends with studs k and k^1 fixed respectively to the stationary part of the carrier frame and to the inner face of said radial arm J^2 , acts to turn said gear segment toward the right, or into a position where its teeth will intermesh with those on the pinion I . In the particular construction illustrated the pivot stud J^1 is secured to a base-plate M to which the stud k is also fixed, said base-plate being adapted for attachment to the end plate B of the carriage frame by screws, as shown, or otherwise. By employment of the base-plate M the entire device is made detachable from the carriage frame with the exception of the gear pinion I which may be detached from the platen shaft by taking off the turning knob.

Means are provided for maintaining the gear segment against the force of the spring K in the position shown in Fig. 2 when the platen is turned forward, or toward the right, in order to prevent the last tooth on the gear segment from engaging successively with the teeth on the pinion. Said means comprises parts as follows: N indicates a radially movable friction shoe arranged on the inner lateral face of the gear segment and adapted for frictional engagement with an annular bearing surface on a part attached to the pinion I or the platen shaft. Said annular bearing surface, as shown in the drawings, being formed on a lateral inward extension of the body of the pinion I , which body is made thick enough at its edge to afford space for the pinion teeth and the said annular bearing surface. In order to insure the frictional engagement of the friction shoe with the said bearing surface, said friction shoe is yieldingly supported on the gear segment, so that it is held or pressed outwardly by spring pressure into position for contact with the annular bearing surface N^1 . In the particular construction illustrated in the drawings, said shoe is formed integral with, or fixed to, a spring arm n which is attached to the gear segment and serves to support the shoe on the gear segment and also acts to press said

spring shoe radially outward. The outward movement of said shoe is limited by a pin n^1 which engages with a lug n^2 projecting from the shoe.

When the parts are in the position shown in Fig. 1 and the platen shaft is turned forward, or turning toward the right, the gear segment will be turned until the friction shoe is brought into contact with the bearing surface N^1 on the platen shaft, this occurring just before, or when the end of the gear-segment passes out of engagement with the pinion, and in the further turning of the platen shaft, the frictional engagement of the bearing surface with the shoe will result in the gear segment being turned or carried around until the end of the gear segment is entirely free from contact with the pinion; this being the position shown in Fig. 2. After the action of the shoe has carried the last tooth of the gear segment out of engagement with the teeth on the pinion, the spring K prevents the gear segment from rotating far enough to carry the friction shoe past and out of engagement with the roller N^1 , so that by a backward turning, or rotation toward the left, of the platen the friction shoe will immediately act to turn the gear segment until its teeth are again brought into mesh with the teeth on the pinion.

Means are provided as follows for locking the gear segment against the influence of the spring K in an inoperative position, or in a position out of engagement with the rotative parts associated with the platen shaft. O indicates a bell-crank lever pivoted on a horizontal stud o and comprising a vertical arm O^1 and a horizontal arm O^2 . Said vertical arm is provided at its upper end with an extension o^1 in the form of a hook adapted to engage with a pin o^2 extending laterally from the inner face of the gear segment J . By placing the bell-crank lever in the position shown in dotted lines in Fig. 10, the gear segment can be moved into and held in a position where the teeth on the segment and on the pinion are out of mesh and likewise the friction shoe is out of engagement with the roller N^1 . Said bell-crank lever, when placed in either of its two positions is maintained in such position by means of a spring detent o^3 fixed to the horizontal arm O^2 . Said spring detent is bent at its free end into V-shape and is adapted to engage with either the upper or the lower side of a tooth o^4 constituting part of a locking segment O^3 . When it is desired to put the indicating device into operation, the lever O is placed in the position shown in full lines in Fig. 10, when the spring K will act to move the gear segment into a position with the friction shoe N in engagement with the bearing surface N^1 .

A circumferentially adjustable stop is provided for limiting the turning movement of the gear segment toward the right, said stop

being shown as consisting of a pin k^1 fixed in the inner face of the gear wheel, and an adjustable stop arm L, mounted on the pivot stud J^1 between the gear segment J and the base-plate M in the path of said stud k^1 . Said arm is provided near its outer end with a short laterally extending tooth l which is bent toward the base-plate M to form a detent or latch adapted to engage with any one of a series of notches in the concentrically curved margin of the base-plate M. By the backward turning of the platen shaft and pinion the gear segment is turned to carry the top thereof rearwardly. The turning movement of the parts may be continued until the stud k^1 of the gear segment strikes the stop arm L, when further backward turning movement of the platen will be arrested. By adjusting the stop L angularly about the pivot stud J^1 , the distance through which the platen may be turned backward may be varied as desired.

The plate M may, if desired, be provided with a circularly arranged scale M^1 arranged concentric with the pivotal axis of the gear segment and marked to correspond with the line space intervals and the stop arm L is conveniently provided with an indicating pointer l^2 which can be brought into register with any one of said scale divisions. When such scale is used in connection with the gear segment, the use of the adjustable stop arm L or other stop device may be dispensed with and the operator will then determine, by noting the movement of the gear segment relatively to the scale, the distance through which the platen is turned backwardly.

In Figs. 12 to 15, inclusive, is shown a form of my device similar in all respects to that shown in Figs. 1 to 11, inclusive, except that the means there shown for locking the gear segment in its inoperative position are replaced by a locking means comprising parts as follows:

P indicates a lever or locking arm arranged tangentially on the inner lateral face of the gear segment and pivoted between its ends in a manner allowing it to move in a plane perpendicular to the plane of the gear segment.

p indicates a forked lug or bracket fixed to the face of the gear segment, between the ends of which the arm P is supported by means of a pivot pin p^1 . Said arm P is provided at one end with an extension in the form of a hook p^2 adapted to engage with a tooth P^1 formed on the base-plate M. The said, latter end of the arm P is yieldingly pressed away from the face of the gear segment by means of a flat spring p^3 , and the end of the arm P and one face of the tooth P^1 are beveled or inclined in such manner that when the gear segment is moved in one direction and said inclined faces are brought together the hook p^2 will be pressed toward the face of

the gear segment, and may move past the tooth P^1 and engage with the uninclined face thereof. The parts are so arranged that when the gear segment is in the position shown in Fig. 12, in which position the friction shoe N is in engagement with the friction roller N^1 the turning, by the operator, of the gear segment toward the left far enough to carry the friction shoe out of engagement with the friction roller, will result in the hook p^2 being engaged with the tooth P^1 .

p^4 indicates a pin extending through the gear segment, provided at its outer end with a button p^5 , and adapted to make contact at its inner end with the end of the arm P opposite to the end on which is formed the hook p^2 . By pushing the pin p^4 inward the locking arm P is moved in a manner to effect its release from the tooth P^1 , allowing the spring K to move the gear segment into its operative position.

The general purpose of the paper movement indicating device above described is to indicate to the operator the extent of backward turning movement of the platen required when inserting sheets on which bills or invoices are to be printed, where it is desired to make out a number of bills or invoices and to make carbon copies of the same on a single record strip or long sheet of paper. In a case of this kind, it is desirable that the carbon copies should be spaced as closely as possible upon the record strip, but at uniform distances apart, or with equal spaces between the several carbon copies, and the line space indicating device herein shown is employed to enable the operator to readily insert a new sheet for each separate original bill or invoice in such manner that the first printed line of each carbon copy shall be located a desired distance from the last printed line of the preceding carbon copy. Assuming that a record strip and a sheet of paper for the original bill or invoice has been inserted into the machine, together with a carbon sheet between them, the first bill or invoice may be printed and the carbon copy will be made in the usual manner on the record strip. The printing of the bill or invoice having been completed the same will be removed from the machine by releasing the guide rollers from the platen (through the operation of the lever G or otherwise) and this will be done without disturbing the position of the record or carbon sheet. The platen is turned backwardly to move the record sheet and carbon sheet backwardly to such a point that when a new invoice sheet is inserted the part of the new sheet on which the first line is to be printed will be located at such distance from the last line of the preceding carbon copy on the record sheet as to leave the desired space between the carbon copies.

In using the indicating device described, the parts are placed in their operative position and after the first bill or invoice has been printed and removed from the machine without disturbing the record and carbon sheets, the platen shaft and pinion I will be moved or turned backwardly or toward the left, the gear segment being thereby engaged with the pinion I. The platen will then be turned backward to the desired point for introducing the new invoice sheet, which point will be indicated by the stud k^1 striking the stop-arm L and thus arresting further backward movement of the gear segment and platen. Such stopping point may be determined by observation of the movement of the arm J^2 along or over the scale M^1 and by stopping the backward turning movement of the platen when said arm reaches the desired point on the scale. After the new invoice sheet has been inserted the platen is turned in a forward direction to bring the same, together with the record sheet, in position for printing the first line on the new invoice sheet, and when this position is reached, the gear segment, in its movement toward the left, will pass out of intermeshing engagement with the pinion I, and the printing may be then proceeded with without any movement being given to the gear segment.

The distance through which the platen must, in any particular instance, be turned backward before inserting an invoice sheet, varies according to the distance necessary to be left on the invoice sheet from the top of said sheet to the first printed line thereon, and the distance to be left between the copies on the record sheet. This distance must be determined, when changing from one style of invoice sheet to another, either by experiment or by noting the line space distance that the platen must be turned backward before a new sheet is inserted, in order that the new sheet when fed forward in position for printing the first line thereon will have such relation to the record sheet that the said first line will be at a desired number of line space distances below the last line of the preceding carbon copy on said record sheet.

The scale M^1 will be marked, or the notches l located, to correspond with the line space distances through which the platen is turned, and it follows that the operator, having ascertained the number of line space distances through which the platen must be turned backward for an invoice sheet having a certain width of heading will place the stop arm into engagement with the desired notch l^1 in which case the backward movement of the platen will be arrested automatically at the desired point, in its backward turning movement, or if the adjustable stop be not used, the operator turns the platen backward until the edge of the arm J^2 on the gear segment, reaches the mark on the scale cor-

responding to the desired number of line spaces, then inserts the new invoice sheet and turns the platen forward until the invoice sheet is brought into position for printing the first line thereon.

The part herein termed a gear segment constitutes in effect a movable rack member which, in the broader aspect of my invention may have other form than that of a gear segment, and the broader claims hereto appended are designed to cover said rack member whether made of curved form, so as to constitute part of the rim of a wheel, or not.

I claim as my invention:—

1. A line space indicator for typewriters comprising a gear pinion which turns with the platen, a rack member adapted to intermesh with the gear pinion and which passes out of mesh with the gear pinion in the forward turning movement of the platen and becomes reengaged with the pinion in the backward turning movement of the platen, and means operated by such forward turning of the platen acting when the rack member passes out of mesh with the pinion to give further movement to said rack member in a direction to carry its end tooth entirely out of contact with the teeth of the pinion.

2. A line space indicator for typewriters comprising a gear pinion which turns with the platen, a rack member adapted to intermesh with the gear pinion and which has backward and forward endwise movement to carry its gear teeth into and out of mesh with the pinion, said rack member being arranged to be thrown out of intermeshing engagement with the gear pinion by the forward turning movement of the platen, means for causing said rack member to be brought into mesh with the pinion in the backward turning movement of the platen, a pointer, and a scale associated with said pointer for indicating the extent of movement of said rack member.

3. A line space indicator for typewriters comprising a gear pinion which turns with the platen, a rack member adapted to intermesh with the gear pinion and which has backward and forward endwise movement to carry its gear teeth into and out of mesh with the pinion, said rack member being arranged to be thrown out of intermeshing engagement with the gear pinion by the forward turning movement of the platen, means for causing said rack member to be brought into mesh with the gear pinion by the backward turning movement of the platen, and an adjustable stop for limiting the movement of said rack member.

4. A line space indicator for typewriters comprising a gear pinion which turns with the platen, a rack member adapted to intermesh with said gear pinion and which passes out of mesh with the gear pinion in the forward turning of the platen and becomes re-

engaged with the pinion in the backward turning of the platen and means maintaining frictional engagement between said gear pinion and rack member after the disengagement of said parts in the forward turning of the platen to carry the end tooth of the rack member entirely out of contact with the teeth on the gear pinion.

5. The combination with a pinion and a movable rack member adapted to intermesh therewith, of a part which turns with the pinion provided with an annular friction surface, and a friction shoe carried by the rack member and adapted for engagement with said friction surface.

6. The combination with a pinion and a movable rack member adapted to intermesh therewith, of a part which turns with the pinion and is provided with an annular friction surface, and a friction shoe yieldingly connected with the rack member and adapted for engagement with said friction surface.

7. The combination with a pinion and a movable rack member adapted to intermesh therewith, of a part which turns with the pinion and is provided with an annular friction surface, a friction shoe carried by the rack member and adapted for engagement with said friction surface, and a spring adapted to act on the rack member in a direction to carry it into intermeshing engagement with the pinion.

8. A line space indicator for typewriters comprising a gear pinion which turns with the platen and a rack member adapted to intermesh with said gear pinion and which passes out of mesh with and becomes disengaged from the pinion in the forward turning of the platen, and means for carrying said rack member out of engagement, and effecting its reengagement with the pinion comprising an annular friction surface on a part which turns with the gear pinion, and a friction shoe mounted on the gear segment and adapted to engage said friction surface.

9. A line space indicator for typewriters comprising a gear pinion which turns with the platen, a rack member adapted to intermesh with the said pinion, and means for carrying said rack member out of engagement and effecting its reengagement with the said pinion, embracing a part which turns with the pinion and is provided with an annular friction surface, a friction shoe carried by the rack member and adapted to engage said friction surface, and means acting yieldingly on the rack member in a direction to effect its engagement with said pinion.

10. A line space indicator for typewriters comprising a gear pinion which turns with the platen, a rack member adapted to intermesh with said gear pinion, means for carrying said rack member out of engagement and effecting its reengagement with the gear pinion embracing a friction shoe carried by

the rack member, an annular friction surface on a part which turns with the pinion, and a spring adapted to act on the rack member in a direction to effect its reengagement with the pinion.

11. A line space indicating device for typewriters embracing a pinion which turns with the platen and a movable rack member adapted to intermesh with said pinion and which is carried out of mesh with said pinion by the forward turning movement of the platen shaft, an annular friction surface on a part which turns with said pinion, and a friction shoe yieldingly supported on said gear segment and adapted to engage with said friction surface.

12. A line space indicating device for typewriters embracing a gear pinion which turns with the platen, a movable rack member adapted to intermesh with said pinion and which is carried out of mesh with said pinion by the forward turning movement of the platen shaft and becomes reengaged with said pinion in the backward turning movement of said platen shaft and means affording frictional engagement between said gear pinion and the rack member when the latter is out of mesh with said pinion.

13. A line space indicating device for typewriters embracing a pinion which turns with the platen and a movable rack member adapted to intermesh with said pinion and which is carried out of mesh with said pinion by the forward turning movement of the platen shaft, means acting to move said gear segment into mesh with the pinion in the backward turning movement of the platen, and means for locking said gear segment in a position out of engagement with said pinion.

14. A line space indicating device for typewriters embracing a pinion which turns with the platen and a movable rack member adapted to intermesh with said pinion and which is carried out of mesh with said pinion by the forward turning movement of the platen shaft, means acting to move said gear segment into reengagement with said pinion in the backward turning movement of the platen, and means for locking said gear segment in a position out of engagement with said pinion, said latter means comprising a pin projecting laterally from the face of said gear segment, and an arm pivoted to the stationary part of the carriage frame and provided with a hook adapted for engagement therewith.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 30th day of April A. D. 1907.

CHARLES CLARENCE POOLE.

Witnesses:

G. R. WILKINS,
S. D. HIRSCHL.