

(No Model.)

5 Sheets—Sheet 1.

A. A. MORSE.
TYPE WRITING MACHINE.

No. 599,187.

Patented Feb. 15, 1898.

Fig. 1

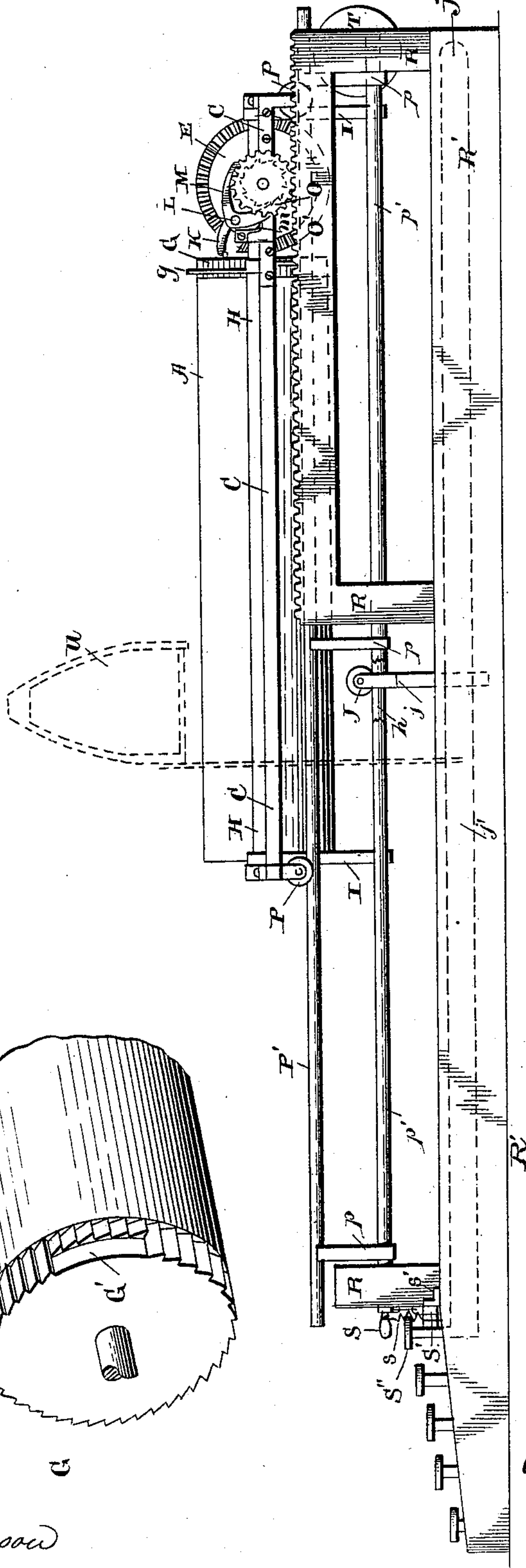
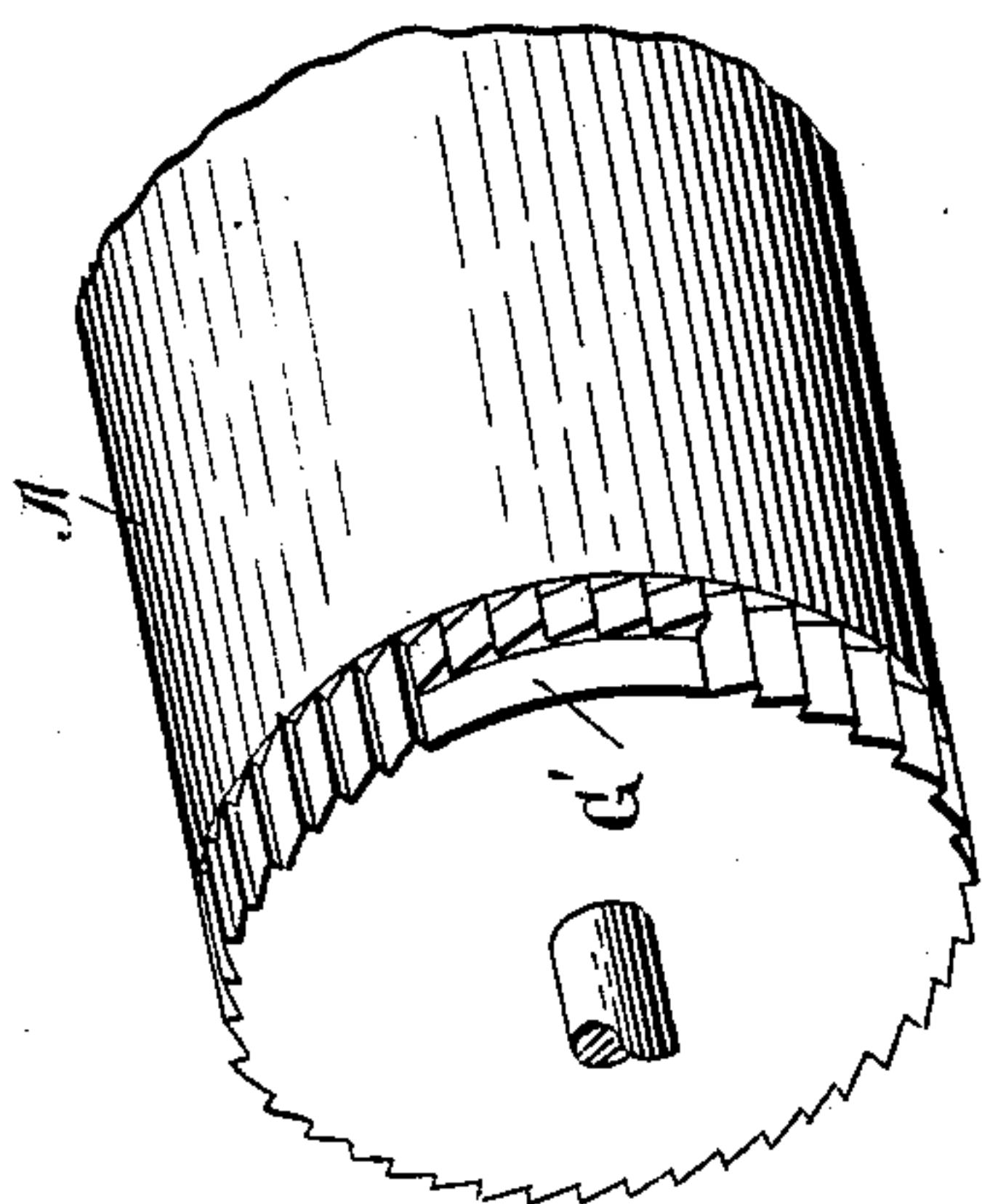


Fig. 2



Witnesses
Geo. E. Trech.
Clark W. Thompson

Inventor
Arthur A. Morse

(No Model.)

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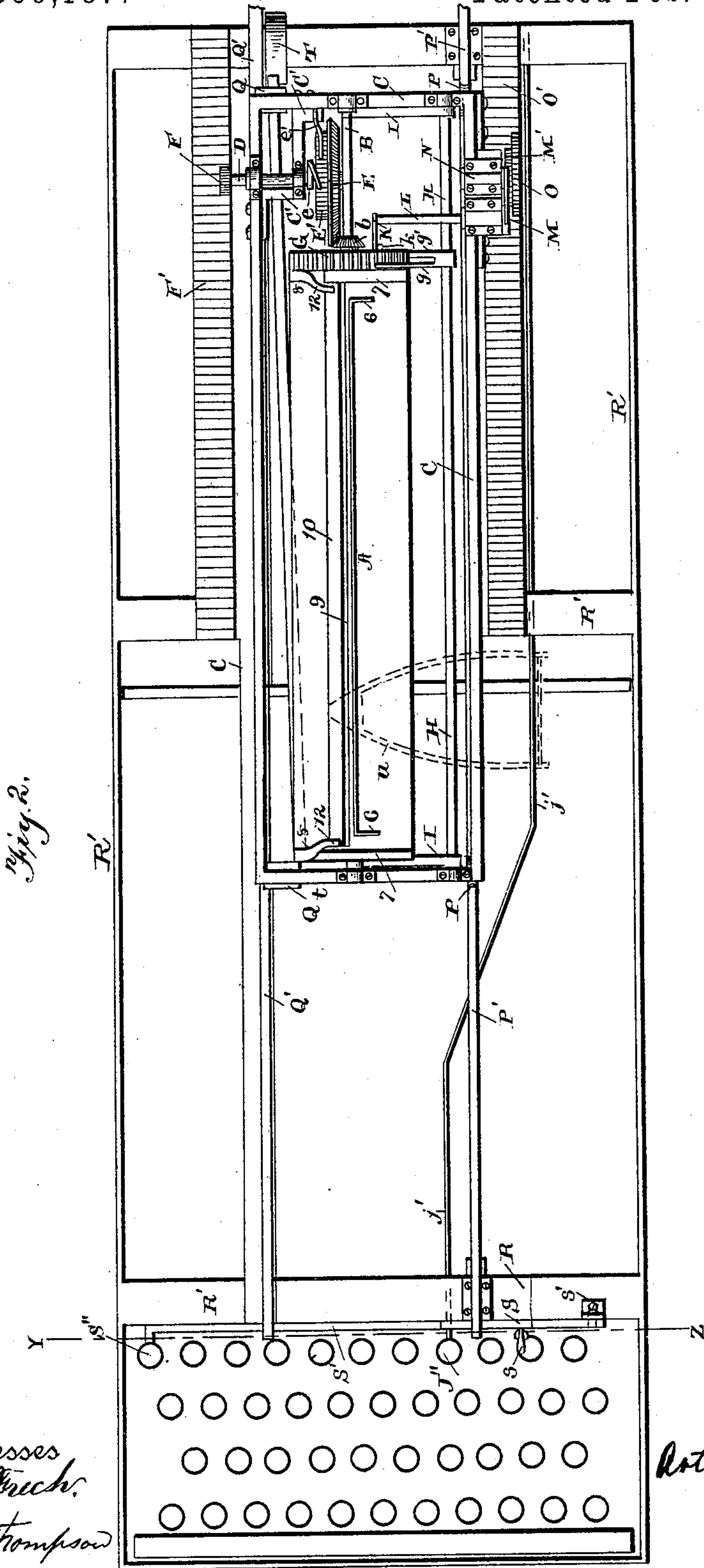


Fig. 2.

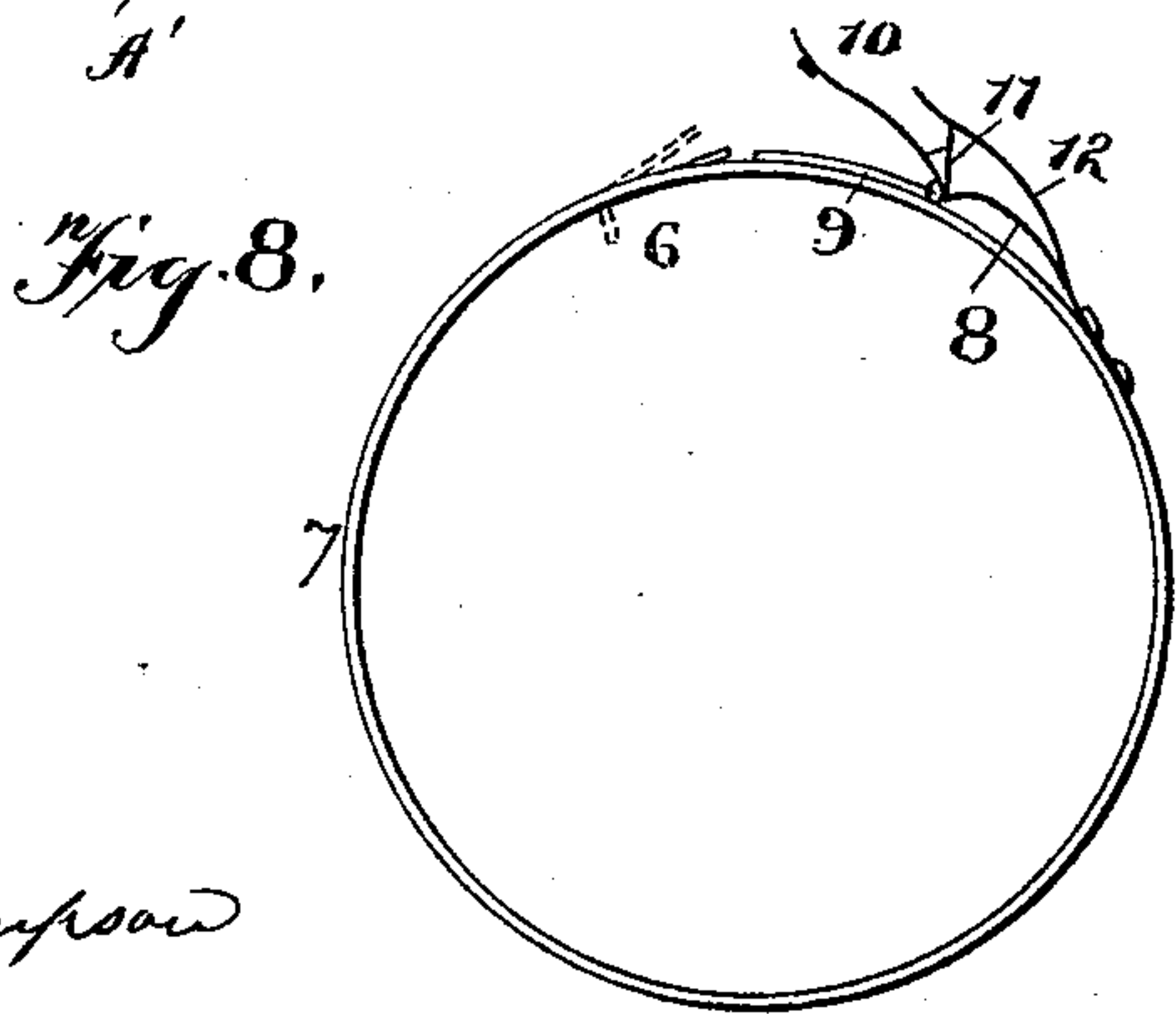
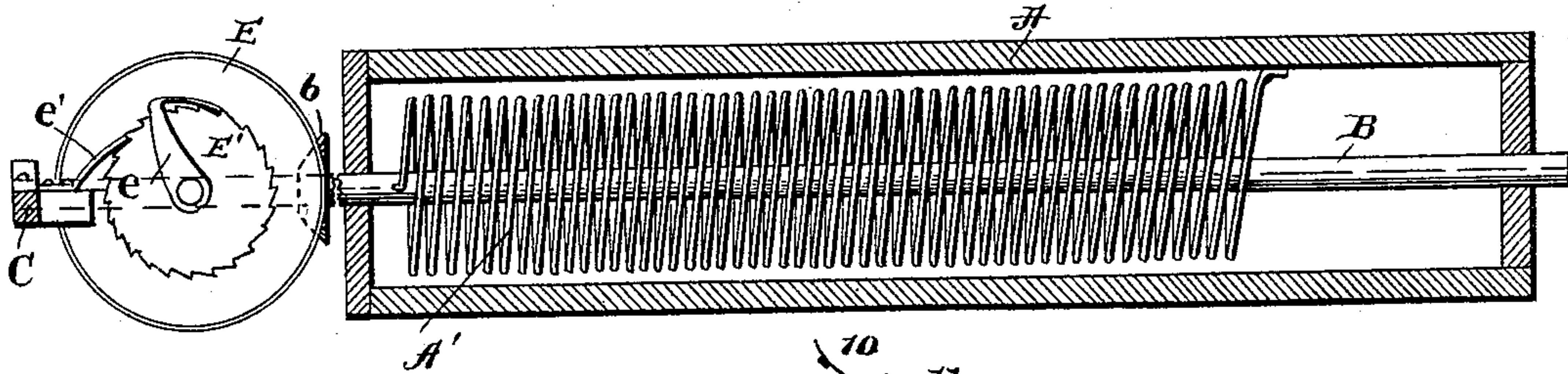
Witnesses
Geo. E. French.
Chas. W. Thompson

Inventor
Arthur A. Morse

5 Sheets—Sheet 3.

No. 599,187.

Patented Feb. 15, 1898.



Witnesses
Geo. E. Truch.
Clark W. Thompson

Inventor
Arthur Morse

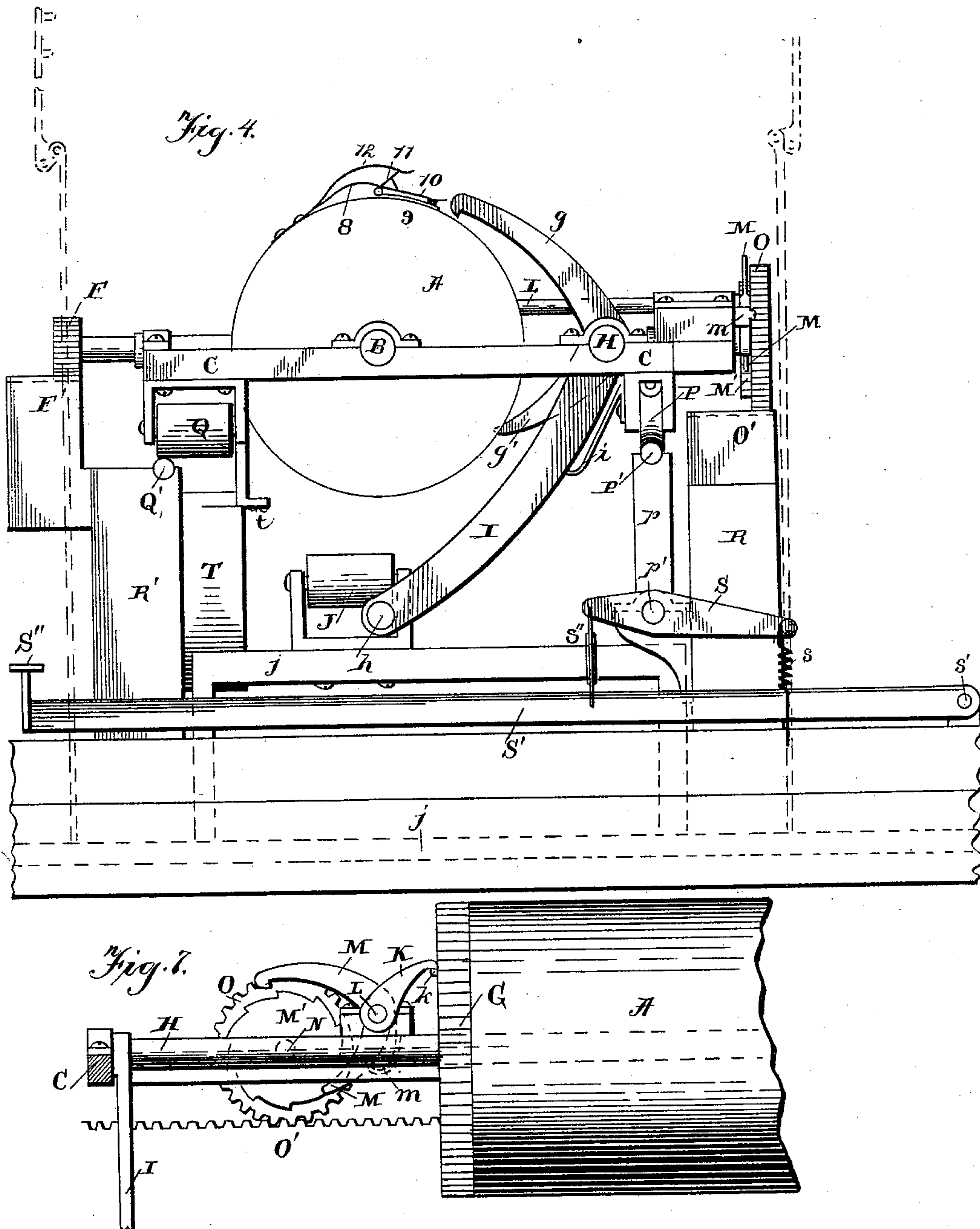
(No Model.)

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Clark W. Thompson

Inventor
Arthur A. Morse

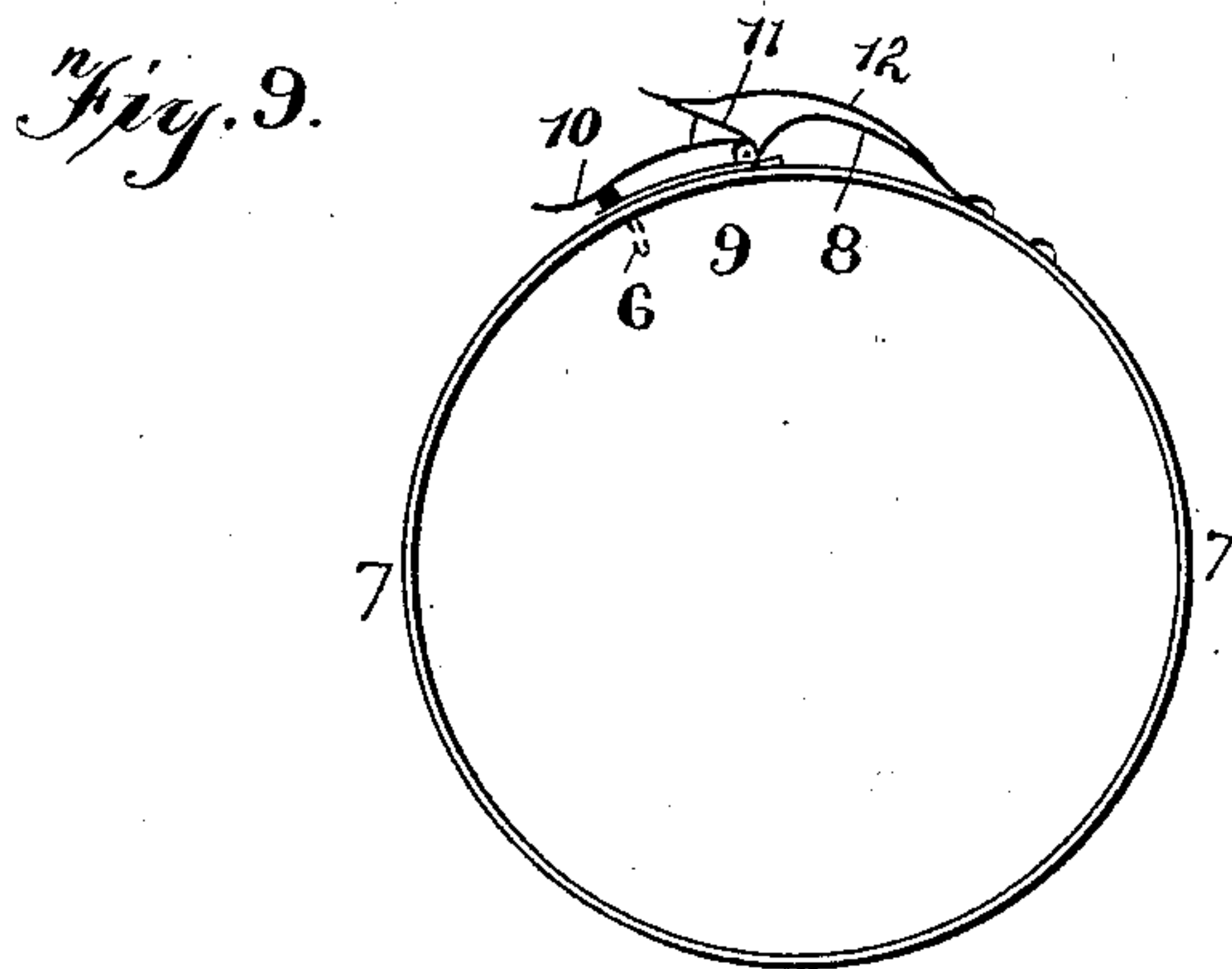
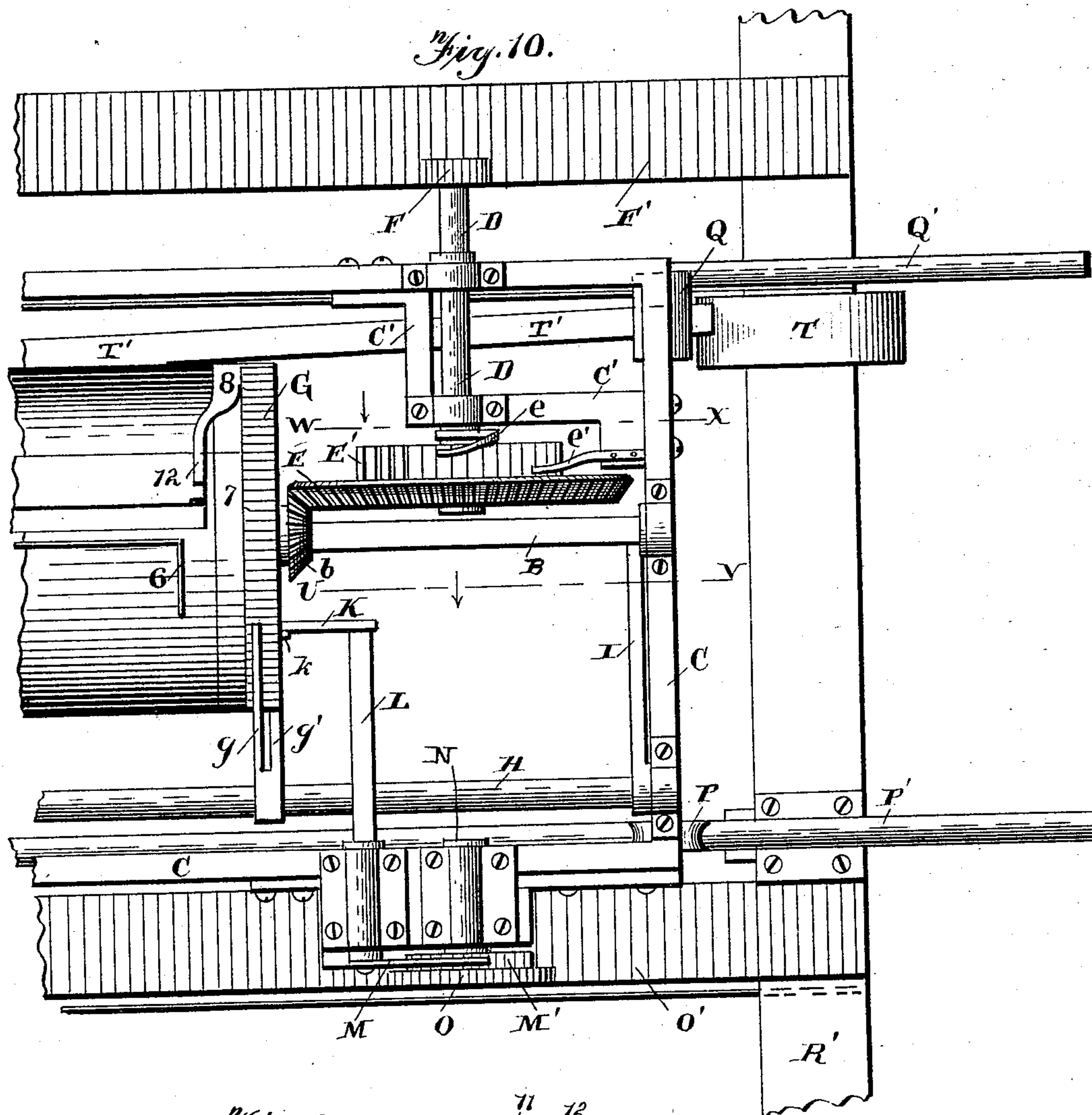
(No Model.)

5 Sheets—Sheet 5.

A. A. MORSE.
TYPE WRITING MACHINE.

No. 599,187.

Patented Feb. 15, 1898.



Witnesses
Geo. E. French.
Clark W. Thompson

Inventor
Arthur Morse

UNITED STATES PATENT OFFICE.

ARTHUR A. MORSE, OF LA CROSSE, WISCONSIN.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 599,187, dated February 15, 1898.

Application filed June 5, 1897. Serial No. 639,577. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR A. MORSE, a citizen of the United States, residing at La Crosse, in the county of La Crosse and State of Wisconsin, have invented certain new and useful Improvements in Type-Writers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in type-writers; and it consists, first, in a spring-actuated endwise-moving cylinder which has a continuous turning movement as the type-bars are operated, combined with an escapement mechanism which is operated by each one of the type-bars for permitting the cylinder to partially turn and thus form the space between the letters, and an escapement which is operated by a spur on the end of the cylinder for forming the spaces between the lines; second, a cylinder which has an endwise movement, a spring which is placed therein to cause the cylinder to partially revolve each time that one of the type-bars is operated, and a mechanism connected with the spring for rewinding the spring as the cylinder is returned to its starting position; third, in the arrangement and combination of parts, as will be more fully described hereinafter.

The object of my invention is to produce a continuous type-writing machine in which the cylinder revolves continuously in the same direction while the keys are being operated.

Figure 1 is a side elevation of a machine which embodies my invention complete. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged rear end view. Fig. 4 is an enlarged section taken upon the line Y Z of Fig. 2. Fig. 5 is a detail view taken on the line X W of Fig. 10. Fig. 6 is a longitudinal vertical section of the cylinder, showing the spring placed therein. Fig. 7 is an enlarged side elevation of the spacing mechanism, taken on the line U V of Fig. 10. Fig. 8 is an elevation of the clip for holding the paper, the clip being shown as open. Fig. 9 is a similar view

showing the clip closed. Fig. 10 is an enlarged plan view of the mechanism connected to the rear end of the cylinder. Fig. 11 is a perspective of the end of the cylinder, showing the cut-away portion for forming the alignment.

R' represents the frame of the machine, which may be of any preferred shape, size, or construction that may be desired, and from the top edges of which rise the standards R, which form supports for the operating parts. In the front end of this frame is arranged the keyboard in the usual manner, and connected to each of the keys J'' is the usual operating key-bar j', which is pivoted at j'', as shown. All the key-bars j' bear against the lower portion of the frame j, which is provided with the friction-roller J upon its top, so that each time that one of the key-bars is operated this frame j is depressed for the purpose of operating the two levers I, one of which is placed at each end of the platen-cylinder, as shown in Fig. 1. The lower ends of these levers I are connected by the shaft h, which extends from one lever I to the other, so that as the platen-carrying frame C moves endwise, carrying the escapement feed-levers with it, the roller J will always bear against the top of the rod h. As the frame C moves endwise, being supported upon the rollers P Q, which travel upon the rods Q' P', and as the rod h moves endwise under the roller J at the same time, a depression of any one of the key-bars will cause the frame j to sink and in sinking to depress the roller J, and this causes the two levers I to partially rock the shaft H, which is journaled upon the frame C, and to which shaft H the upper ends of the two levers I are secured. This shaft H extends the length of the frame or carriage C, which is provided with suitable bearings for it. In order to return the shaft H and the levers I to position as soon as they are left free to move, which is when the frame j rises to its normal position, a spring i is secured to the frame or carriage C, and the inner lower end of this spring bears against the outer side of the lever I, as shown in Figs. 3 and 4. Also secured to the rocking shaft H is an escapement, which consists of the two arms g g', which are out of line with each other, as shown in Figs. 2 and 10, and which alternately engage with the ratchet-wheel G

upon the rear end of the cylinder A. Each time that a type-bar is depressed the levers I cause the shaft H to partially rock and the arm *g'* is drawn out of contact with the ratchet-wheel G and the arm *g* is made to engage therewith, and then when the frame *j* rises again after having been depressed the arm *g* is released and the arm *g'* is again made to engage with the teeth of the ratchet-wheel G. In this manner each depression of a type-bar allows the cylinder to be revolved the space of one tooth upon the ratchet-wheel G, and this movement of the cylinder forms the space between the letters.

The cylinder A is journaled at each end upon the carriage or frame C and is made hollow, so as to receive the shaft B, which extends longitudinally through its center, and the spring A', which is fastened at one end to the inner side of the cylinder and at the other to the shaft B. This spring is coiled around the shaft sufficiently to cause the cylinder to rotate whenever it is left free to revolve. I do not limit myself to any particular construction of spring, for this may be varied at will.

To one end of the cylinder A is secured the ratchet-wheel G, with which the escapement *g g'* engages, each tooth of the ratchet-wheel representing the space occupied by a letter. As shown in Fig. 11, a portion of the ratchet-teeth are cut away in the path of *g'*, as at G', and this smooth space represents the distance that the cylinder is turned when it reaches the end of a line and is about to start a new one. This space G' also forms the margin which is formed along each edge of the paper that is being written on.

The paper to be written upon is wrapped around the cylinder, so that its edges overlap, and it may be held in position by any suitable means. One form of clamp is shown in Figs. 2, 3, 4, 8, 9, and 10 and consists of two bands 7, one of which is applied to each end of the cylinder, and a spring-wire-guiding device 6, which is fastened at each end directly to the cylinder, as shown in Figs. 2, 8, and 9. This wire acts as a guide to keep the paper perfectly straight, while the spring-actuated clamps 9 and 10 hold one edge of the paper. The plate 9 extends longitudinally with the cylinder A and in a direct contact therewith, and the clamp 10 is pivoted to one edge of this plate 9. This clamp is raised to allow the edge of the paper to be inserted between the plate 9 and the spring-actuated clamp 10, and the spring 12 holds the clamp 10 in a closed position after it has grasped the edge of the paper. The clamp 10 is provided at its inner edge with a little handle or lever 11, which catches under the spring 12 and holds the clamp 10 in a raised position when so desired. When the clamp 10 is closed down upon the paper, the spring bears against this handle or lever 11 and causes the clamp 10 to tightly grasp the paper. After the edge of the paper has been grasped between the

parts 9 and 10 the band 7 is rotated upon the cylinder, and the paper is drawn through under the guiding-wire 6 until the other edge of the paper comes just under it, where it is held.

In writing when the end of a line is reached which is at or near the edge of the paper that is held by the clamps 9 and 10 the smooth place G' upon the ratchet-wheel G is encountered by the escapement-dog *g'*, and then the cylinder revolves the length of this smooth place G' and aligns the letters along the other edge of the paper that is held between the parts 9 and 10. As the cylinder is intended to revolve one tooth continuously in the same direction each time that a type-bar is struck, the paper must be just wide enough to wrap around the cylinder and overlap at the edges. The operator does nothing but continuously operate the types from the beginning to the end of the page without any further thought or reference to the carriage or any movement thereof. Having no carriage to continuously move back to the starting position, the operator does not lose his or her place upon the notes, and the time spent in moving the carriage back is saved.

One end of the shaft B projects through the end of the cylinder and has the beveled pinion *b* secured thereto, and this pinion meshes with the beveled wheel E, which is placed loosely on and near one end of the shaft D. Upon the outer end of the shaft is secured the pinion F, which meshes with the rack F', which extends longitudinally with the cylinder, but is secured rigidly to the frame, so as to have no movement during the operation of the machine. As the cylinder is operated it is drawn by the spring T' endwise away from the operator. The spring A' is gradually unwound from the shaft B, which does not rotate while the cylinder is making its outward movement; but after the cylinder has completed its outward movement the operator catches hold of the carriage at any suitable point and draws it backward to the starting-point nearest to the operator, and during this backward movement the rotation of the pinion F along the rack F' causes the spring to be rewound to the necessary tension.

In order to prevent the shaft B from rotating while the carriage and cylinder are making their outward movement, the ratchet-wheel E' is also placed loosely upon the shaft D, but is secured to the wheel E, so that the two move together. In order to prevent these two wheels E E' from revolving while the cylinder is making its outward movement, the pawl *e'* engages with the ratchet-wheel E' and prevents the ratchet-wheel E' and the wheel E from revolving the shaft B so as to affect the spring. As soon, however, as the backward movement of the carriage and the roller begins the pawl *e*, which is keyed fast to the shaft D, engages with the ratchet-wheel E', so as to cause the wheels E E' and the pinion *b* to revolve and thus revolve the shaft B so as to rewind the spring.

In order to form the spaces between the lines, upon the outer end of the cylinder is a small stud or projection *k*, which catches against the arm *K* upon the end of the partially-rotating shaft *L*, and to the outer end of the shaft *L* is secured the escapement *M*. (Shown more especially in Fig. 7.) This escapement *M* engages with the ratchet-wheel *M'*, placed upon the carriage parallel with the shaft *L*, but slightly below the shaft *L*. On the outer end of the shaft *N* is secured the toothed wheel *O*, which engages with the stationary rack *O'* and which corresponds to the one *F'* upon the opposite side of the frame. Each time that the cylinder makes a complete revolution the stud or projection *k* strikes against the arm *K* and moves it just sufficiently to rotate the shaft *L* slightly and this shaft in turn operates the escapement *M*. As the escapement releases the ratchet-wheel *M'* the wheel *O* is left free to revolve and move a predetermined distance upon the rack *O'*, and while the ratchet *M'* is thus freed from the escapement the spring *T'*, which is wrapped in the drum or cylinder *T*, draws the carriage endwise the distance that is to be made between the lines. This spring *T'* is fastened at *t* to the inner end of the carriage, and as the carriage is drawn toward the operator this spring *T'* is drawn outward and held at a tension. Each time that the stud or projection operates the arm *K* the spring draws the carriage outward just as the end of the line is reached.

As shown in Figs. 1, 2, and 4, the shift-key *S''* is provided, and this shift-key is placed upon the lever *S'*, which is pivoted at *s'*, and is connected by any suitable ligament *s''* with the short lever *S*, that is secured to one end of the partially-rotating shaft *p'*. Also secured to this shaft *p'* are the arms *p*, which are notched at their upper ends, so as to receive the guide *P'*, upon which the wheel *P* travels. When the lever *S* is operated by the shift-key, *p'* is partially revolved, and the arms *p*, secured thereto, force the whole carriage and its attachments laterally sufficiently far to bring into play another set of type. This lateral movement of the carriage causes the racks *F' O'* to be made sufficiently wide to allow the wheels engaging therewith to remain in contact with them when the lateral shift of the carriage is made. The roller *Q* is also made of sufficient length to permit it to slide upon its support *Q'*.

Having thus described my invention, I claim—

1. In a continuous-writing type-writer, a carriage, a platen-cylinder journaled therein, and which is adapted to rotate continuously in one direction as the type-bars are operated, and a spring placed in the cylinder to cause it to so rotate, combined with a mechanism for rewinding the spring as the carriage is drawn backward to the starting-point, substantially as shown.

2. In a continuous-writing type-writer, a

reciprocating carriage, a platen-cylinder journaled therein, a spring placed in the cylinder for causing it to revolve continuously in the same direction, as the type-bars are operated, combined with a shaft placed in the cylinder, and to which one end of the spring is secured, and a mechanism for rewinding the spring as the cylinder is drawn back to its starting-point, substantially as described.

3. In a continuous-writing type-writer, a reciprocating carriage, a platen-cylinder journaled therein, a shaft extending through the cylinder, and a spring placed in the cylinder and having one end secured to the cylinder and the other to the shaft, combined with a pinion placed upon the shaft, a gear-wheel for meshing with the pinion, and a ratchet-wheel, both loosely placed upon the shaft, a shaft upon which these wheels are loosely placed and which is provided with a pinion at one end, and a stationary rack with which the pinion on the end of the shaft engages, and suitable pawls which engage with the ratchet-wheel, substantially as set forth.

4. In a continuous-writing type-writer, a carriage, a platen-cylinder journaled thereon, a shaft passing through the cylinder, and a spring placed in the cylinder and having one end attached to the cylinder and the other to the shaft, combined with a suitable mechanism for rewinding the spring as the carriage is drawn back to its starting-point, the spring being at its highest tension at the starting-point, and at its lowest tension when the carriage has reached the length of its movement, substantially as specified.

5. In a continuous-writing type-writer, a hollow platen-cylinder, which is adapted to rotate continuously in the same direction as the type-bars are operated, a spring placed in the cylinder for causing it to so rotate, the type-bars, a suitable escapement and pawls connected with the type-bars for releasing and stopping the action of the spring, combined with a suitable mechanism for rewinding the spring, as the carriage is returned to its starting-point, substantially as described.

6. In a continuous-writing type-writer, a carriage, a platen-cylinder journaled therein, a spring placed inside of the said cylinder to cause it to rotate continuously in the same direction, as the type-bars are operated, a spur or projection extending from the end of the cylinder, a mechanism which is operated by this spur or projection at each revolution of the cylinder, and a spring for moving the carriage endwise, each time the mechanism is operated, the parts being combined and arranged to operate, substantially as set forth.

7. In a continuous-writing type-writer, an endwise-moving carriage, a cylinder journaled therein, and which is adapted to revolve continuously in the same direction, as the type-bars are operated, a spur or projection upon the cylinder, a partially-rotating shaft, provided with an arm which is operated at each revolution of the cylinder so as

to partially revolve said shaft, an escapement also secured to the shaft, a second shaft provided with both a ratchet and a toothed wheel; and a rack with which the toothed wheel engages, combined with a spring for drawing the carriage endwise, at each revolution of the cylinder, substantially as specified.

8. In a continuous-writing type-writer, an endwise-moving carriage, a platen-cylinder journaled therein, a spring placed inside of the said cylinder to cause it to revolve continuously in the same direction as the type-bars are operated, a ratchet-wheel upon the cylinder, having a portion from which the teeth are removed, and an escapement which engages with said ratchet-wheel, combined with a suitable mechanism connected with the type-bars by means of which the escapement is operated, when the end of the line is reached, substantially as shown.

9. In a continuous-writing type-writer, the key-levers, a frame that is operated vertically,

a shaft, and a lever journaled upon the shaft and which is connected at its lower end to the frame so as to be operated thereby, combined with an escapement-pawl which is secured to the same shaft as the lever, a carriage, a partially-rotating lever journaled upon the carriage to which both the lever and escapement-pawl are secured, and a type-cylinder having a spring which continuously revolves the cylinder in the same direction when the type-bars are operated; a ratchet-wheel formed on the end of the cylinder and with which the escapement-pawls engage, and mechanism for moving the carriage endwise at the end of each line, so as to form the space between the lines, substantially as described.

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

ARTHUR A. MORSE.

Witnesses:

CLARK W. THOMPSON,
S. Y. HYDE.