(No Model.) 2 Sheets—Sheet 1.

E. E. HORTON.

TYPE WRITING MACHINE.

No. 605,877. Patented June 21, 1898.

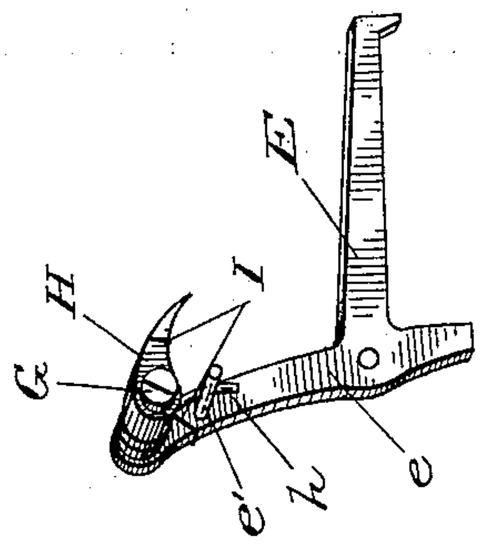

Fig. 4

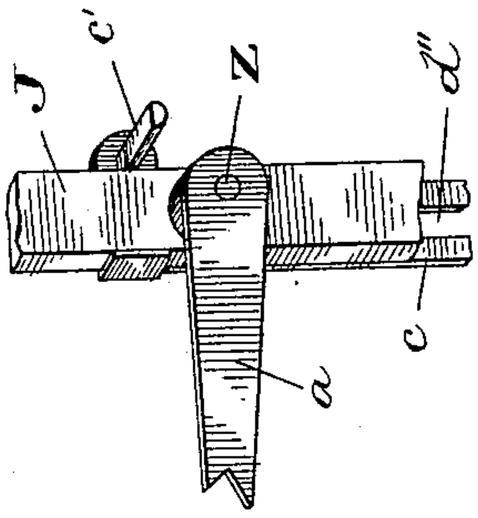

Fig. 6

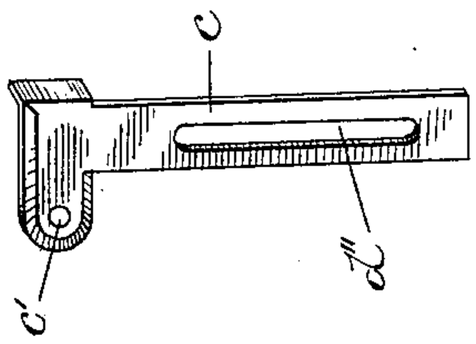

Fig. 5

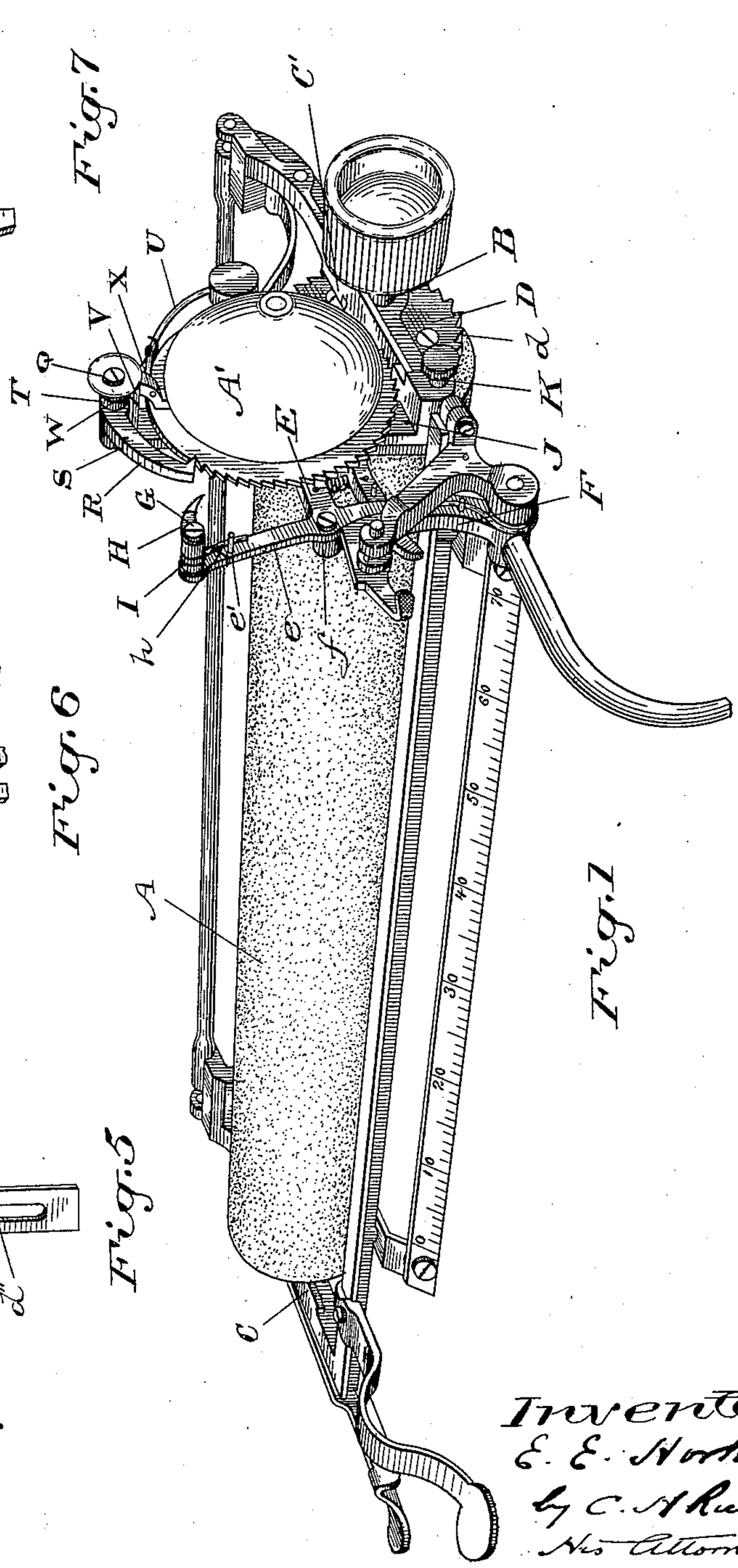

Fig. 7

Witnesses
J. E. Lamuon
M. L. Westwood

Inventor
E. E. Horton
by C. A. Riches
his Attorney

(No Model.) 2 Sheets—Sheet 2.

E. E. HORTON.

TYPE WRITING MACHINE.

No. 605,877. Patented June 21, 1898.

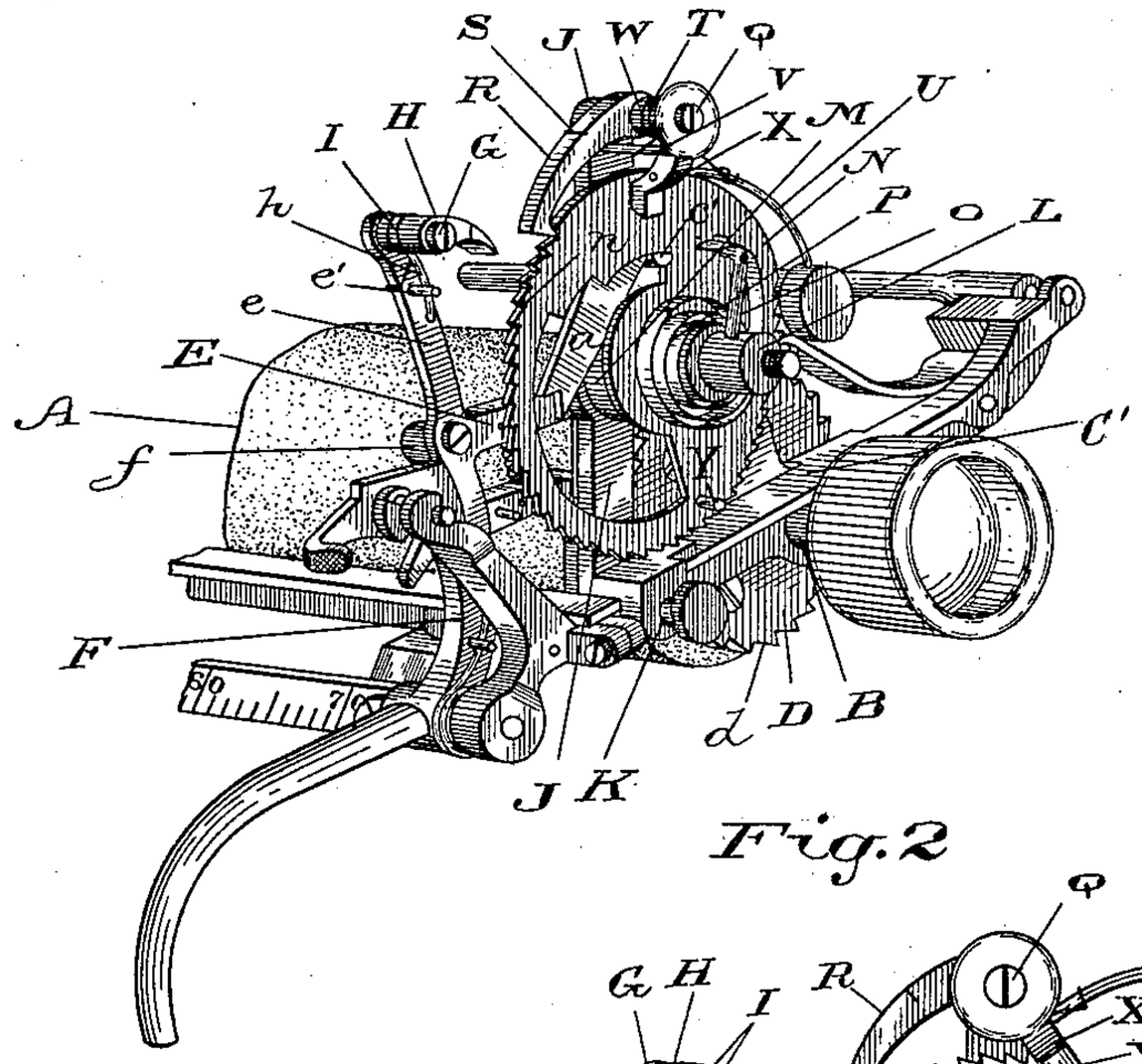

Fig. 2

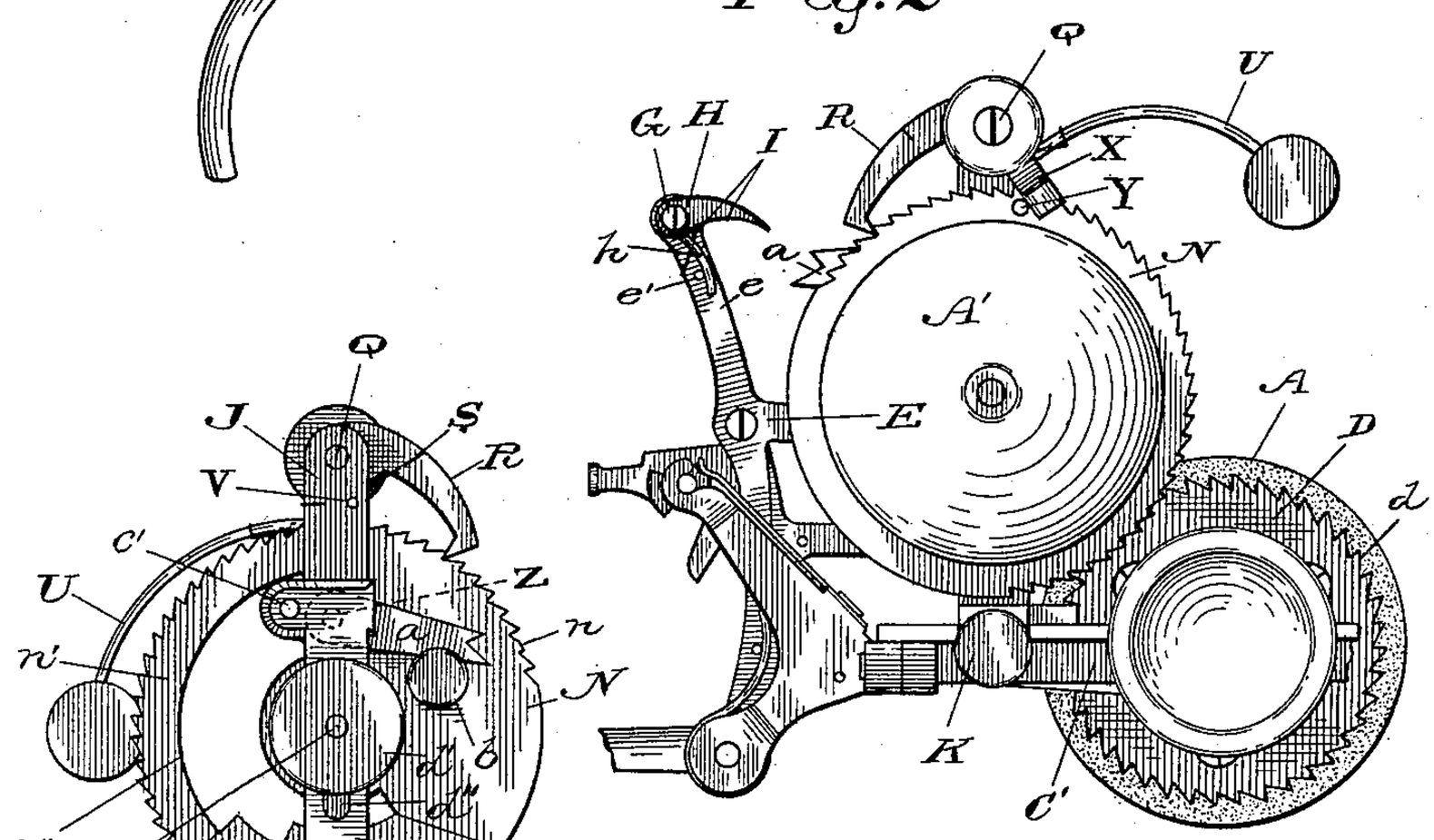

Fig. 3

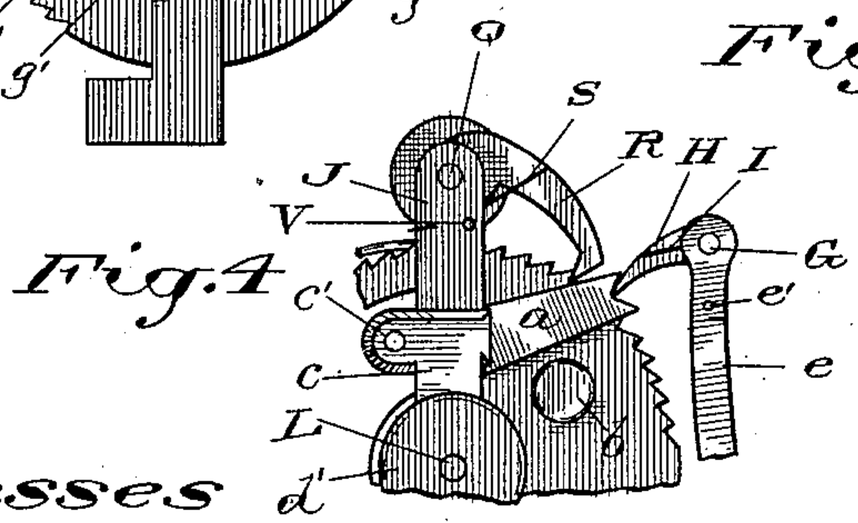

Fig. 4

Witnesses

J. E. Cameron

M. A. Westwood

Fig. 8

Inventor

E. E. Horton

by C. N Riches

his Attorney.

UNITED STATES PATENT OFFICE.

EDWARD E. HORTON, OF TORONTO, CANADA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 605,877, dated June 21, 1898.

Application filed June 12, 1897. Serial No. 640,577. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. HORTON, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented a certain new and useful attachment to the carriages of type-writing machines to intimate the end of the sheet of writing material within the machine; and I hereby declare that the following is a full, clear, and exact description of the same.

The object of this invention is to provide a type-writing machine with an attachment which will intimate to the operator the fact that the last line on the sheet of paper within the machine has just been finished, thus obviating the necessity of continuously watching the paper to avoid writing off the end of the paper or sheet, and to so construct the attachment that it can be easily and quickly adjusted to a sheet of paper of any predetermined length; and it consists, essentially, of the device hereinafter more fully set forth, and more particularly pointed out in the claims.

In the drawings, Figure 1 represents a perspective view of a carriage of a type-writing machine, showing the attachment applied. Fig. 2 is a detailed perspective view of the attachment and operating-pawl with the gong removed. Fig. 3 is an end elevation of the outer side of the same. Fig. 4 is a similar view from the inner side. Fig. 5 is a view of the adjustable stop. Fig. 6 is a view of the trip. Fig. 7 is a view of the operating-pawl. Fig. 8 is a view similar to Fig. 4, but showing parts in different position.

Like letters of reference refer to like parts throughout the specification and drawings.

In the drawings I have shown the attachment applied to the carriage of a Remington type-writing machine. I do not, however, intend to confine myself to the use of this attachment on any particular style of type-writing machine.

The general construction of the carriage of the type-writing machine is the same as that now in common use, and I do not intend specifying any of the parts other than those which are directly related to the attachment.

A represents the platen, the trunnions B of which are journaled in the ends C C′ of the frame of the carriage. Secured to the end of the platen A adjacent to the end C′ of the frame of the carriage is a ratchet-wheel D, the teeth *d* of which are engaged by the line-spacing pawl E, pivoted to the arm *f* of the line-spacing lever F. That part of the line-spacing pawl E operating the ratchet-wheel D is similar in construction and purpose to the line-spacing pawl now used. This pawl, however, is provided with an upwardly-extending arm *e*, from the side face of which extends a stud or pin G. Pivotally mounted on the stud G is a dog or pawl H, and depending from the dog or pawl H is an arm *h*, which abuts against the pin *e′*, extending from the side face of the arm *e* below the stud G. The purpose of the pin *e′* is to limit the downward movement of the dog H. Embracing the dog H is one end of a spring I, the opposite end of the spring being secured to the arm *e*. The purpose of the spring I is to keep the dog H in position to engage the proper tooth of the ratchet-wheel and to return the dog to its normal or starting position when disengaged from the ratchet-wheel hereinafter mentioned.

J represents a standard connected to the end C′ of the carriage-frame by means of a clamp K. The standard J is located between the trunnion B and the front of the frame of the carriage. Extending from the middle of the outer side face of the standard J is a stud L, and loosely mounted upon the stud L is the hub M of a ratchet-wheel N. The periphery of the ratchet-wheel N is provided with a series of teeth *n*, each of which represents one line-space. The number of the teeth *n* corresponds with the greatest usual number of line-spaces on any single sheet of paper to be written upon. Rigidly mounted on the stud L on the outer side of the hub M is a pin O, and connected to the pin O and to the hub M is a recoil-spring P. Extending from the top of the outer side face of the standard J is a stud Q, and pivotally mounted on the stud Q is a detent-pawl R, which engages the teeth *n* of the ratchet-wheel N. Connected to the standard J and to the detent-pawl R is a spring S, which holds the detent-pawl in engagement with the teeth *n* of the ratchet-wheel N. Pivotally mounted on the stud Q on the outer side of the detent-pawl R is the hub T of the striker U of the gong. Extend-

ing from the outer side face of the standard J immediately below the stud Q is a pin V. Connected to the pin V is one end of a spring W, while the opposite end of the spring is connected to the striker U. The purpose of the spring W is to prevent the independent movement of the striker when the carriage has been turned back to examine the work. Extending from the hub T of the striker U is an arm X, which is adapted to rest against the pin V when the striker is in its normal position. The motion of the striker U when returning to its normal position after being operated is arrested by the arm X coming into contact with the pin V. Extending from the outer side face of the ratchet-wheel N is a pin Y, which is adapted to engage the arm X during the rotation or partial rotation of the ratchet-wheel to move the arm to lift the striker into an elevated position. Extending from the outer side face of the standard J above the stud L is a stud Z, and pivotally mounted on the stud Z is a toothed trip *a*. Connected to the inner side face of the ratchet-wheel N is a pin *b*, which is adapted to lift the trip *a* into a position to engage the end of the detent-pawl R. This trip *a* is lifted into a position to engage the end of the detent-pawl R at the commencement of the last line, and when the last line has been completed and the line-spacing lever is again operated the dog or pawl H instead of engaging a tooth of the ratchet-wheel N is brought into position to engage the toothed end of the trip *a* and operate the trip to raise the detent-pawl R out of engagement with the teeth of the ratchet-wheel N and hold it clear of the ratchet-wheel until the line-spacing lever has been permitted to return to its normal position. When the detent-pawl R has been lifted out of engagement with the teeth of the ratchet-wheel N, the ratchet-wheel is sharply reversed and returned to its starting position by the spring P.

The stud L extends beyond the inner side face of the standard J. Embracing the inner side face of the standard J is a vertically-movable plate *c*, provided with a slot *d''*, through which extends the adjacent end of the stud L. Mounted upon the stud L is a clamping-nut *d'*, which locks the plate C in any adjusted position. Extending outwardly from the top of the plate *c* is a stop-pin *c'*, which projects through and beyond the ratchet-wheel N. Part of the web *n'* of the ratchet-wheel N is cut away to form an opening *n''* to allow of the free adjustment of the pin when the plate is being moved vertically. The web *n'* is so cut as to form a series of stop-shoulders *g g' g''* to engage the pin *c'* and limit the backward rotation of the ratchet-wheel when returning to its starting position after being operated. When the plate *c* has been set to bring the pin *c'* into its lowermost position, it engages the stop *g*. When the plate has been set to bring the pin *c'* into an intermediate position, it engages the stop *g'*, and when the plate has been set to raise the pin *c'* into its uppermost position it engages the stop *g''*.

On a sheet of foolscap there is ordinarily space for thirty-six lines of type-written matter, and as the foolscap size is the largest-sized paper commonly made use of the number of teeth cut on the ratchet-wheel is thirty-six, one tooth corresponding with each line-space. When the attachment has been set to announce the lines on a sheet of foolscap paper, the pin *c'* at the commencement of the operation of the attachment rests against the stop *g*, and the relation of this stop *g* is such as to bring the first tooth of the ratchet-wheel N into engagement with the detent-pawl R.

As is well known, each type-writing machine is provided with a line-spacing adjustment. When this adjustment has been set to cause each complete operation of the line-spacing lever to revolve the platen-roll one line-space, the same operation of the line-spacing lever causes the dog H to move the ratchet-wheel N forward a space of one tooth, which is seized and held by the detent-pawl R. During the revolution of the ratchet-wheel N the trip *a* is raised by the pin *b*, and on the thirty-sixth operation of the line-spacing lever F the trip *a* is brought into position to be engaged by the dog H. On the thirty-seventh operation of the line-spacing lever F the dog H engages the toothed end of the trip *a* and, lifting the trip *a* against the end of the detent-pawl R, lifts the detent-pawl out of engagement with the teeth of the ratchet-wheel N, allowing the sharp return of the ratchet-wheel N to its normal or starting position. During the rotation of the ratchet-wheel N the pin Y engages and carries forwardly the arm X and lifts the striker U into an elevated position. The sharp return of the ratchet-wheel to its normal position allows the striker U to fall forcibly on the gong A' and audibly announce the completion of the page.

On letter-sized paper there is ordinarily space for twenty-four lines of type-written matter, and the stop *g'* is arranged in such relation to the teeth of the ratchet-wheel that when the pin *c'* has been adjusted to engage the said stop the detent-pawl R will engage the twelfth tooth of the ratchet-wheel in order that twenty-four operations of the line-spacing lever F will cause the pin *b* on the ratchet-wheel N to raise the trip *a* into a position to be engaged by the dog H on the twenty-fifth operation of the line-spacing lever and lift the detent-pawl R out of engagement with the teeth of the ratchet-wheel and allow of the sharp return of the ratchet-wheel to its normal or starting position at the twelfth tooth, permitting at the same time the fall of the striker U on the gong A', audibly announcing the completion of the page of the letter-sheet.

The relation of the stop *g''* to the teeth *n* of the ratchet-wheel N is such that when the pin *c'* has been moved into position to engage the

stop g'' the detent-pawl R will engage the twenty-fourth tooth of the ratchet-wheel in order that on the thirteenth operation of the line-spacing lever the detent-pawl R will be raised out of engagement with the teeth of the ratchet-wheel N in the manner hereinbefore described to allow of the sharp return of the ratchet-wheel and striker.

The dog H moves the ratchet-wheel N forward only one tooth on each complete operation of the line-spacing lever, without reference to the width of line-spacing to which the line-spacing mechanism is adjusted. The wide line-spacing is usually one-half wider than the normal line-spacing and the narrow line-spacing one-half of the normal line-spacing. It therefore follows that if the wide spacing is employed in writing on a sheet of foolscap paper there will be only two-thirds the number of the normally-spaced lines and that if the narrow line-spacing is employed there will be double the number of the normally-spaced lines to the page.

In the former case the pin c' will be set to engage the stop g' in order that the ratchet-wheel will commence its work at the twelfth tooth, and in the latter case the pin c' will be set to engage the stop g and two complete operations of the ratchet-wheel will be required before the last line in the page has been typewritten. In this latter case the two complete operations of the ratchet-wheel N will necessitate two soundings of the gong to the page. On the first sounding the operator will observe that only one-half the page has been written upon, and on the second sounding he will observe that the page has been completed.

The dog H when it engages the trip a to lift the detent-pawl R out of engagement with the teeth of the ratchet-wheel N holds the detent-pawl R out of engagement a sufficient length of time to allow of the return of the ratchet-wheel.

I do not wish to confine myself to any particular number of teeth on the ratchet-wheel nor to any particular number of stops, as I may vary the teeth and stops according to the nature of the work for which the machine is being employed. Neither do I wish to confine myself to any particular means for securing the attachment to the carriage of the typewriting machine, as I may connect it either permanently or temporarily in any suitable manner. Nor do I wish to confine myself to the use of the pin c' and stops $g\ g'\ g''$, as any equivalent construction will answer the purpose equally as well. Nor do I wish to confine myself to connecting the dog H to the line-spacing pawl E, as I may connect it directly to the line-spacing lever F.

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

1. A type-writing machine embracing in its construction a line-spacing lever, a ratchet-wheel rotated a distance equal to one line-space by each operation of the line-spacing lever, and means for adjusting the rotation of the ratchet-wheel to the predetermined number of lines, substantially as specified.

2. A type-writing machine embracing in its construction a line-spacing lever, a ratchet-wheel rotated a distance equal to one line-space by each operation of the line-spacing lever means for adjusting the rotation of the ratchet-wheel to the predetermined number of lines, and an indicator operated by the completion of the movement of the ratchet-wheel, substantially as specified.

3. In a type-writing machine a means to automatically announce the completion of a page of writing consisting of a ratchet-wheel and an indicator, operated by the completion of the movement of the ratchet-wheel, in combination with the line-spacing lever, a pawl carried by the line-spacing lever to actuate the ratchet-wheel, and an adjustable stop to limit the reversal of the ratchet-wheel, substantially as specified.

4. In a type-writing machine a means to automatically announce the completion of a page of writing, consisting of a ratchet-wheel, a gong, and a striker operated by the ratchet-wheel to sound the gong on the completion of the movement of the ratchet-wheel, in combination with the line-spacing lever, a pawl carried by the line-spacing lever to actuate the ratchet-wheel, and an adjustable stop to limit the reversal of the ratchet-wheel, substantially as specified.

5. In a type-writing machine a means to automatically announce the completion of a page of writing consisting of a ratchet-wheel and an indicator, operated by the completion of the movement of the ratchet-wheel, in combination with the line-spacing lever, a pawl carried by the line-spacing lever to actuate the ratchet-wheel, a detent-pawl normally engaging the teeth of the ratchet-wheel during its forward rotation, and a trip raised by the ratchet-wheel into position on the completion of a page of writing to upset the detent-pawl and allow of the reversal of the ratchet-wheel, substantially as specified.

6. In a type-writing machine a means to automatically announce the completion of a page of writing, consisting of a ratchet-wheel, a gong, and a striker operated by the ratchet-wheel to sound the gong on the completion of the movement of the ratchet-wheel, in combination with the line-spacing lever, a pawl carried by the line-spacing lever to actuate the ratchet-wheel, a detent-pawl normally engaging the teeth of the ratchet-wheel during its forward rotation, and a trip raised by the ratchet-wheel into position on the completion of a page of writing material to upset the detent-pawl and allow of the reversal of the ratchet-wheel, substantially as specified.

7. In a type-writing machine a means to automatically announce or intimate the completion of a page of writing, consisting of a standard connected to the carriage of the machine, a stud projecting from the side face of the

standard, a gong connected to the outer end of the stud, a ratchet-wheel revolubly mounted on the stud between the standard and the gong, and a striker actuated by the completion of movement of the ratchet-wheel to sound the gong, substantially as specified.

8. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the line-spacing mechanism, a ratchet-wheel actuated by the operation of the line-spacing mechanism, a gong, a striker for the gong operated by the movement of the ratchet-wheel, and an adjustable stop to limit the reverse movement of the ratchet-wheel, substantially as specified.

9. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of a ratchet-wheel actuated by the operation of the line-spacing mechanism, and a series of adjustable stops to limit the reverse rotation of the movement of the ratchet-wheel, substantially as specified.

10. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the carriage of the machine, a ratchet-wheel revolubly connected to the carriage, actuated by the operation of the line-spacing mechanism, a series of adjustable stops to limit the reverse rotation of the movement of the ratchet-wheel, a gong, and a striker operated by the completion of movement of the ratchet-wheel to sound the gong, substantially as specified.

11. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of a ratchet-wheel, a detent-pawl engaging the teeth of the ratchet-wheel, a trip adapted to be raised toward the detent-pawl during the rotation of the ratchet-wheel, the line-spacing lever, having a line-spacing pawl, and an auxiliary pawl adapted to engage and raise the trip against the end of the detent-pawl, and lift it out of engagement with the teeth of the ratchet-wheel, substantially as specified.

12. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of a ratchet-wheel, a detent-pawl engaging the teeth of the ratchet-wheel, a trip adapted to be raised toward the detent-pawl during the rotation of the ratchet-wheel, the line-spacing lever, having a line-spacing pawl, an auxiliary pawl adapted to engage and raise the trip against the end of the detent-pawl, and lift it out of engagement with the teeth of the ratchet-wheel, and means for reversing the ratchet-wheel to return it to its starting position, substantially as specified.

13. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of a ratchet-wheel, a detent-pawl engaging the teeth of the ratchet-wheel, a trip adapted to be raised toward the detent-pawl during the rotation of the ratchet-wheel, the line-spacing lever, having a line-spacing pawl, an auxiliary pawl adapted to engage and raise the trip against the end of the detent-pawl, and lift it out of engagement with the teeth of the ratchet-wheel, means for reversing the ratchet-wheel to return it to its starting position, a gong, and a striker actuated by the completion of the movement of the ratchet-wheel to sound the gong, substantially as specified.

14. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of a ratchet-wheel, a detent-pawl engaging the teeth of the ratchet-wheel, a trip adapted to be raised toward the detent-pawl during the rotation of the ratchet-wheel, the line-spacing lever, having a line-spacing pawl, an auxiliary pawl adapted to engage and raise the trip against the end of the detent-pawl, and lift it out of engagement with the teeth of the ratchet-wheel, means for reversing the ratchet-wheel to return it to its starting position, a gong, a striker actuated by the completion of the movement of the ratchet-wheel to sound the gong, and a series of adjustable stops to limit the reverse rotation of the ratchet-wheel, substantially as specified.

15. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, a ratchet-wheel having a series of teeth, in combination with a line-spacing lever, having an auxiliary pawl adapted to engage the teeth of the ratchet-wheel during the forward rotation of its movement, a detent-pawl to engage the teeth of the ratchet-wlieel during its forward rotation, a trip to be engaged by the auxiliary pawl and raised against the detent-pawl to lift it out of engagement with the teeth of the ratchet-wheel on the completion of its rotation, a gong, a striker actuated by the movement of the ratchet-wheel to sound the gong, and an adjustable stop to limit the reverse rotation of the ratchet-wheel, substantially as specified.

16. In an attachment for a type-writing machine to intimate or announce the completion of a page of writing, the combination of the carriage of the machine, a standard connected to the carriage, a stud extending from the side face of the standard, a ratchet-wheel revolubly mounted in the stud, a spring connected to the stud and to the ratchet-wheel to reverse it, a second stud projecting from the top of the side face of the standard, a detent-pawl pivotally mounted on the stud engaging the teeth of the ratchet-wheel, a striker the hub of which is pivotally mounted on the said second stud, an arm depending from the hub of the striker, a pin connected to the side face of the ratchet-wheel, adapted to engage the said arm to raise the striker into an elevated position during the forward rotation

of the ratchet-wheel, a gong adapted to be sounded by the fall of the striker, and a pawl connected to the line-spacing lever to rotate forwardly the ratchet-wheel, substantially as specified.

17. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the carriage of the type-writing machine, a standard connected to the carriage, a stud projecting from the side face of the standard, a ratchet-wheel pivotally mounted on the said stud, a spring connected to the stud and to the ratchet-wheel to reverse it after the completion of its movement, a stud projecting from the top of the standard, a detent-pawl pivotally mounted on the stud engaging the teeth of the ratchet-wheel, a striker, the hub of which is rotatably mounted on the second stud, an arm depending from the hub of the striker, a pin connected to the side face of the ratchet-wheel to engage the said arm to lift the striker into an elevated position, a pin connected to the standard to arrest the return movement of the striker and arm, a gong adapted to be sounded by the fall of the striker, and an auxiliary pawl connected to the line-spacing lever to actuate the ratchet-wheel, substantially as specified.

18. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the carriage of the type-writing machine, a standard connected to the carriage, a stud projecting from the side face of the standard, a ratchet-wheel pivotally mounted on the said stud, a spring connected to the stud and to the ratchet-wheel to reverse it after the completion of its movement, a stud projecting from the top of the standard, a detent-pawl pivotally mounted on the stud engaging the teeth of the ratchet-wheel, a striker, the hub of which is rotatably mounted on the second stud, an arm depending from the hub of the striker, a pin connected to the side face of the ratchet-wheel to engage the said arm to lift the striker into an elevated position, a pin connected to the standard to arrest the return movement of the striker and arm, a gong adapted to be sounded by the fall of the striker, and an auxiliary pawl connected to the line-spacing lever to actuate the ratchet-wheel, and a spring connected to the pin and to the striker to prevent its movement when the carriage has been upset, substantially as specified.

19. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of a ratchet-wheel, a detent-pawl engaging the teeth of the ratchet-wheel, the line-spacing lever, an auxiliary pawl carried by the line-spacing lever, a trip brought into position during the rotation of the ratchet-wheel to be engaged by the auxiliary pawl, and move against the end of the detent-pawl, and lift the detent-pawl out of engagement with the teeth of the ratchet-wheel, substantially as specified.

20. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the carriage of the machine, a standard connected to the carriage, a stud projecting from the side face of the standard, a ratchet-wheel revolubly mounted on the stud, a detent-pawl engaging the teeth of the ratchet-wheel, a trip pivoted to the standard eccentric to the ratchet-wheel, a pin connected to the side face of the ratchet-wheel to bring the trip into position during the forward rotation of the ratchet-wheel, an auxiliary pawl connected to the line-spacing lever adapted to engage the trip after the completion of the forward rotation of the ratchet-wheel, and bring it against the detent-pawl to lift the detent-pawl out of engagement with the teeth of the ratchet-wheel to allow of its reverse rotation, substantially as specified.

21. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the line-spacing lever, an auxiliary pawl carried by the line-spacing lever, a ratchet-wheel adapted to be rotated by the auxiliary pawl during the operation of the line-spacing lever, an adjustable stop to limit the reverse rotation of the ratchet-wheel, and means for reversing the ratchet-wheel after completing its forward rotation, substantially as specified.

22. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the carriage of the machine, a standard connected to the carriage, a plate slidably mounted on the said standard, a clamp for holding the plate in any set position, a stop-pin carried by the plate, a stud projecting from the side face of the standard, a ratchet-wheel revolubly mounted on the stud, the web of the ratchet-wheel having a series of stop-shoulders cut in it adapted to engage the pin in its set position to limit the reverse rotation of the ratchet-wheel, the line-spacing lever, and an auxiliary pawl carried by the line-spacing lever adapted to engage the teeth of the ratchet-wheel and cause its forward rotation, substantially as specified.

23. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the carriage of the machine, a standard connected to the carriage, a plate slidably mounted on the said standard, a clamp for holding the plate in any set position, a stop-pin carried by the plate, a stud projecting from the side face of the standard, a ratchet-wheel revolubly mounted on the stud, the web of the ratchet-wheel having a series of stop-shoulders cut in it adapted to engage the pin in its set position to limit the reverse rotation of the ratchet-wheel, the line-spacing lever, an auxiliary pawl carried by

the line-spacing lever adapted to engage the teeth of the ratchet-wheel and cause its forward rotation, a detent-pawl engaging the teeth of the ratchet-wheel, a trip pivoted to the standard eccentric to the ratchet-wheel, a pin carried by the adjacent side face of the ratchet-wheel to bring the trip into position to be engaged by the auxiliary pawl on the completion of the movement of the ratchet-wheel, to bring it against the detent-pawl, and lift the detent-pawl out of engagement with the ratchet-wheel, to allow of its reversal, substantially as specified.

24. In an attachment for a type-writing machine to automatically intimate or announce the completion of a page of writing, the combination of the carriage of the machine, a standard connected to the carriage, a stud projecting from the outer side face of the standard, a ratchet-wheel revolubly mounted on the stud, a spring connected to the stud and to the ratchet-wheel to reverse it after the completion of its movement, a gong mounted on the outer end of the stud, the web of the ratchet-wheel cut away to form a series of stop-shoulders, a second stud extending from the top of the standard, a detent-pawl pivotally mounted on the said stud engaging the teeth of the ratchet-wheel, a striker, the hub of which is mounted on the second stud, an arm depending from the hub of the striker, a pin connected to the side face of the ratchet-wheel to engage the said arm and raise the striker into an elevated position, a pin projecting from the standard to engage the arm and limit the return movement of the striker, a spring connected to the pin and to the striker to hold it when the carriage is upset, a trip pivoted to the standard eccentric to the ratchet-wheel, a pin connected to the adjacent face of the ratchet-wheel to bring the trip into position during the rotation of the ratchet-wheel, the line-spacing lever, an auxiliary pawl carried by the line-spacing lever to engage the teeth of the ratchet-wheel and move it during its forward rotation, adapted to engage the trip when brought into position and move it against the detent-pawl and lift it out of engagement with the teeth of the ratchet-wheel to permit of its reversal and the fall by gravity of the striker on the gong, a plate slidably mounted on the standard a clamp to hold the plate in any set position, a stop-pin projecting from the plate adapted to engage any one of the stop-shoulders of the ratchet-wheel, substantially as specified.

Toronto, June 5, A. D. 1897.

E. E. HORTON.

In presence of—
U. S. RICHES,
C. H. RICHES.