W. S. IRELAND.

TYPE WRITING MACHINE.

APPLICATION FILED DEC. 8, 1917.

1,292,786.

Patented Jan. 28, 1919

3 SHEETS—SHEET 1.

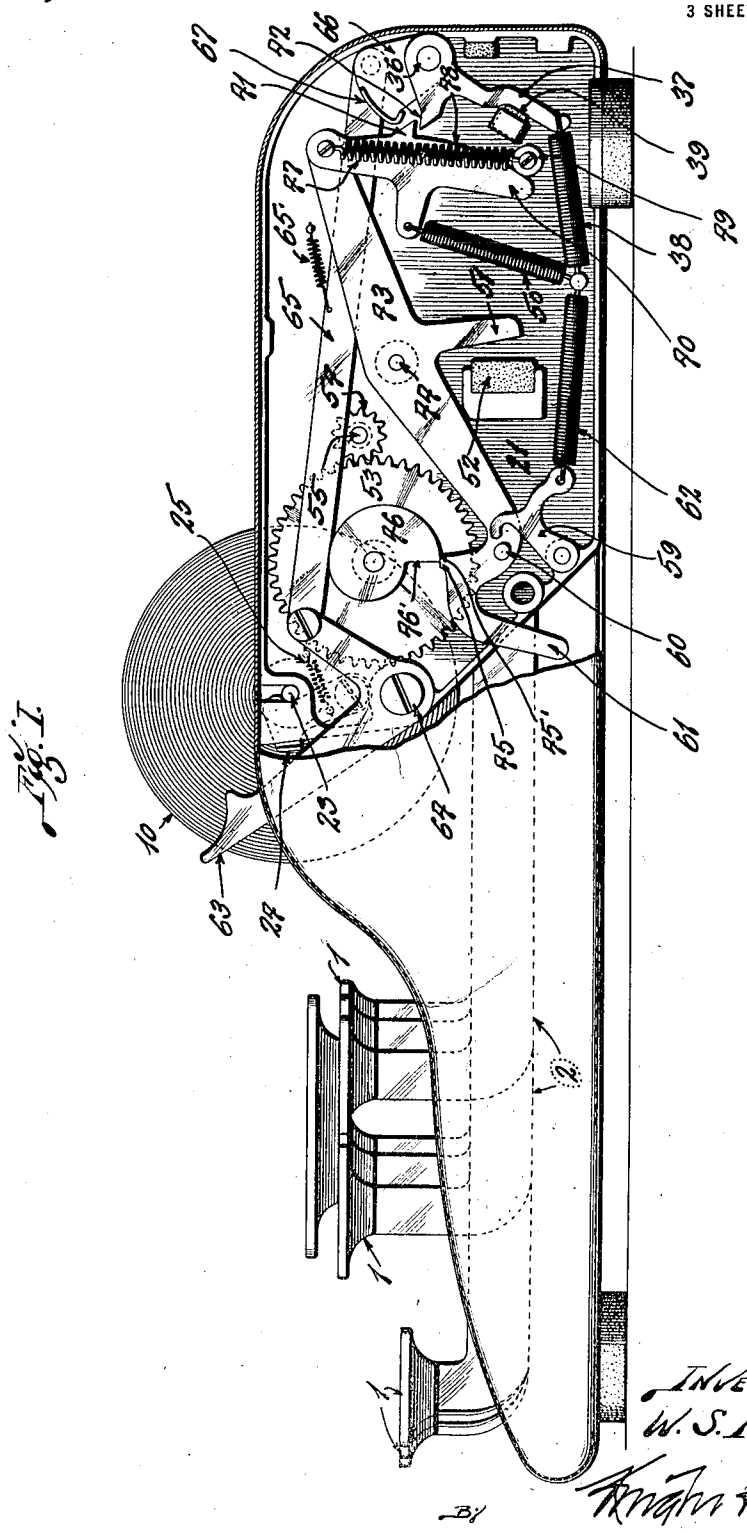


Fig. 1.

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3 SHEETS—SHEET 2.

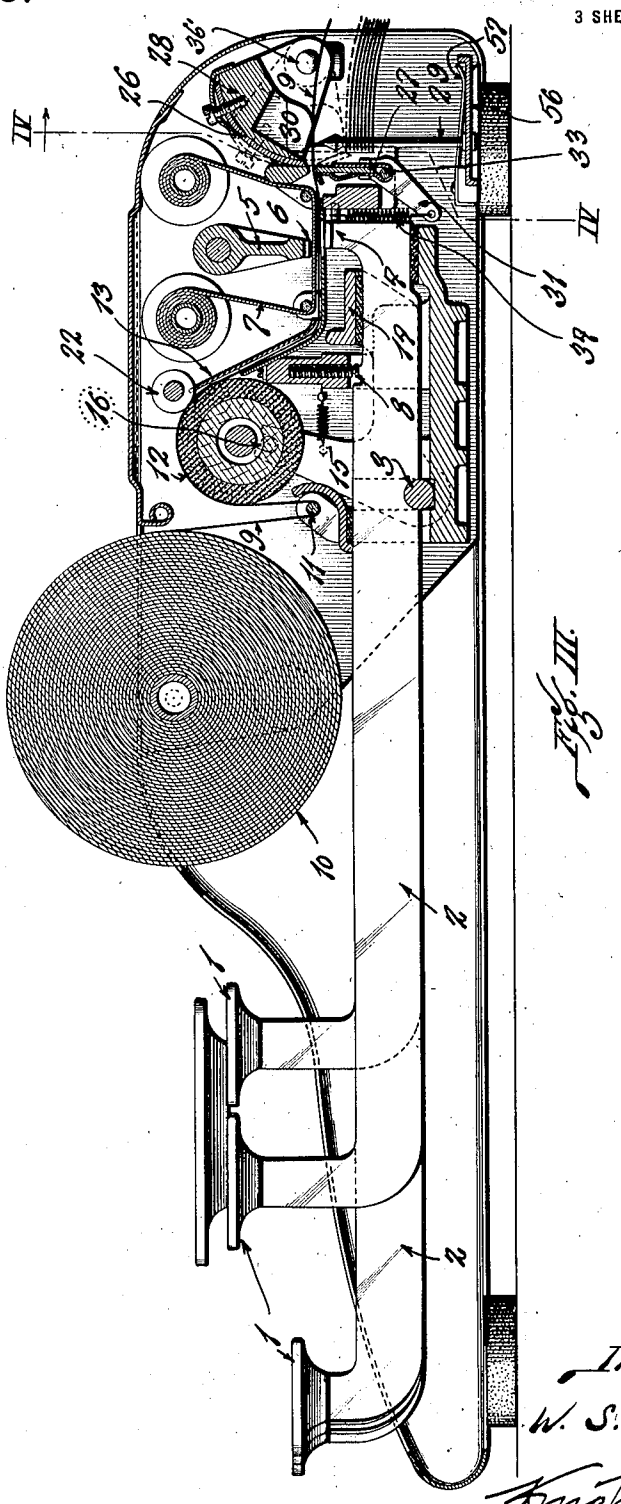


Fig. II.

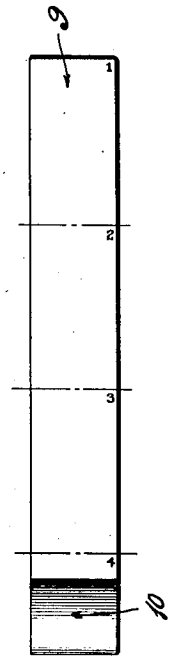


Fig. III.

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3 SHEETS—SHEET 3.

Fig. IV.

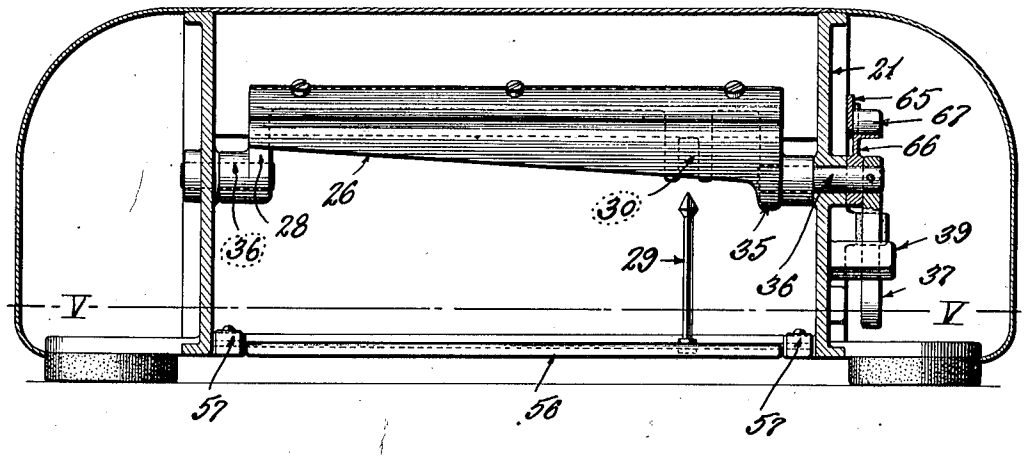


Fig. V.

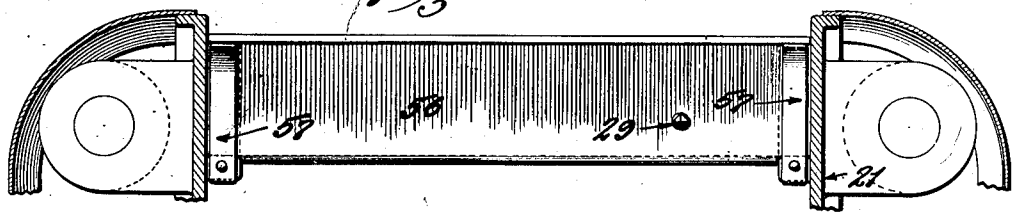


Fig. VI.

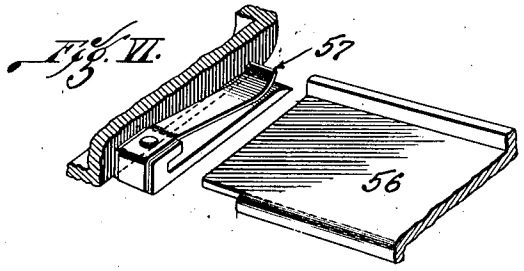


Fig. VIII.

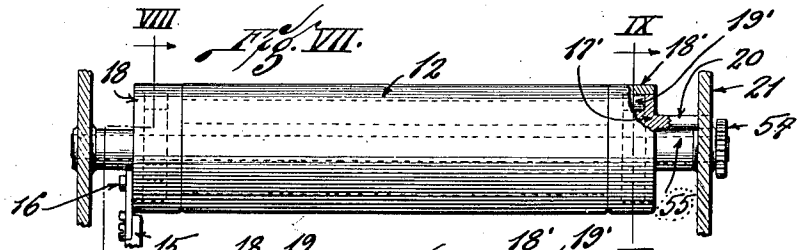


Fig. VIII.

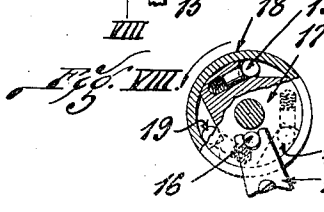
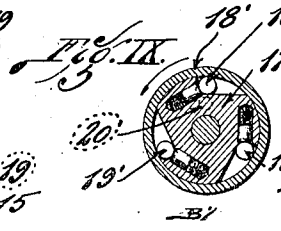


Fig. IX.



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UNITED STATES PATENT OFFICE.

WARD S. IRELAND, OF ST. LOUIS, MISSOURI, ASSIGNOR TO NATIONAL SHORTHAND MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

1,292,786. Specification of Letters Patent. Patented Jan. 28, 1919.

Application filed December 8, 1917. Serial No. 206,179.

To all whom it may concern:

Be it known that I, WARD S. IRELAND, a citizen of the United States of America, a resident of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in typewriting machines. Prior to this invention typewriting machines, especially shorthand machines, have been provided with means for feeding a continuous strip of paper which usually unwinds from a roll and passes to printing devices, whereby the characters are printed line by line. Owing to the peculiar requirements of a shorthand machine, it is a decided advantage to use a very long strip of paper so that the writing may be continued for a considerable period of time without frequent interruptions. However, considerable difficulty has been experienced in handling such paper after it passes from the machine. Shorthand machines have been provided with means for rewinding the paper after it passes from the printing devices, the paper being fed from a supply roll to a rewinding roll, and afterward fed from the rewinding roll while the shorthand notes are being transcribed by the stenographer. Other machines have not been provided with rewinding devices, the paper being torn from such machines in comparatively short strips which are irregular in length and usually difficult to handle on account of the tendency of the paper to recurl after passing from the supply roll. It has also been found difficult to retain the short strips of paper in the desired sequence. Therefore, the paper handling devices of shorthand machines have not been entirely satisfactory.

One of the objects of my invention is to produce a shorthand machine having a filing device whereby the long strip of paper is divided into relatively short sections and filed. In the preferred form of the invention, the strip of paper is severed and filed automatically, the relatively short sheets, or sections, being substantially uniform in length. These short sheets, or sections, are filed consecutively, one above the other, so as to form a compact, or orderly, collection of notes arranged in the desired sequence, so they may be readily transcribed and afterward placed in a permanent file for future reference. If desired, consecutive numbers may be printed at regular intervals on the long strip of paper, and these numbers will constitute page numbers for the filed sheets.

Since the long strip of paper is usually curled around the axis of a supply roll, the preferred form of the invention includes means for uncurling the paper after it passes from the supply roll, thereby straightening the paper before it is severed and attached to the filing device.

Another object of the invention is to produce an automatic filing device so constructed that it will operate in response to movements of key levers. With this object in view, the parts are preferably so constructed and arranged that the energy for driving the automatic filing device is transmitted from the printing keys to an operating spring. The power for operating the automatic filing device is thus gradually stored in the spring during the different key operations, so that the required power is obtained very gradually and without any appreciable effort on the part of the operator.

A further object is to produce a shorthand machine having an automatic filing device whereby the paper is divided into uniform sheets and filed after it passes from the printing device; in combination with means for rendering the automatic filing device ineffective to allow the machine to be operated continuously without actuating the filing device. This enables the machine to be used indefinitely without cutting or filing the paper. The machine herein shown is also provided with a filing key, under the control of the operator, whereby the filing device may be actuated to cut and file the paper at any time. The filing key may be actuated without in any way disarranging the automatic mechanism. It will be important to note that the filing key may be operated by hand when the automatic filing device is ineffective. The paper may then be cut and filed at the will of the operator, this being an advantage under some conditions. For example, in writing letters the paper may be cut and filed by actuating the filing key when the dictation of a letter is

completed. In this event, each letter will appear on an individual sheet, instead of being continued from one sheet to another.

With the foregoing and other objects in view the invention comprises the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention; however, it is to be understood that the invention comprehends changes, variations and modifications which come within the scope of the claims hereunto appended.

Figure I is a side elevation of a shorthand machine constructed in accordance with my invention, one of the side walls of the housing being broken away to show the means for actuating the filing device.

Fig. II is a longitudinal section of the machine.

Fig. III is a detail view, on a small scale, showing the paper supply, a portion of the strip of paper being unwound from the supply roll.

Fig. IV is a vertical section taken approximately on the line IV—IV, Fig. II, showing the filing device at the rear of the machine.

Fig. V is a fragmentary horizontal section taken on the line V—V, Fig. IV, showing the detachable holder to which the filing pin is secured.

Fig. VI is a fragmentary perspective view, showing a portion of the detachable holder and one of the springs whereby the holder is secured to the machine.

Fig. VII is a detail view of the paper feeding roll.

Fig. VIII is a section taken approximately on the line VIII—VIII, Fig. VII, showing the driving clutch whereby a step by step movement is imparted to the paper feeding roll.

Fig. IX is a section taken approximately on the line IX—IX, Fig. VII, showing the retaining clutch associated with the paper feeding roll to prevent retrograde movement.

To illustrate the invention, I have shown a shorthand machine provided with printing keys 1 secured to key levers 2, the latter being pivotally supported by a pivot rod 3. Each key lever 2 is provided at its rear end with an upwardly extending printing hammer 4 adapted to coöperate with a type bar 5 having type characters 6 on its bottom face. An inking ribbon 7 passes between the type bar 5 and the printing hammers 4. Each key lever 2 is arranged directly below a restoring spring 8 (Fig. II), and the restoring springs yieldingly hold the key levers in their non-printing positions. The strip of paper 9 passes downwardly from a supply roll 10, under a small paper straightening rod 11, thence upwardly and over a paper feeding roll 12, downwardly through an inclined passageway 13, and then rearwardly to a filing device near the rear end of the machine. The paper travels between the printing hammers 4 and inking ribbon 7 before it reaches the filing device.

When a printing key is depressed, its key lever 2 turns about the axis of the pivot rod 3 (Fig. II), and the printing hammer 4, at the rear of the key lever, moves upwardly to force a portion of the paper onto the inking ribbon 7, at the same time forcing the ribbon onto one of the type characters 6. The printing keys may be operated independently of each other to print selected characters, and several keys may be operated simultaneously to print a line of characters, as is well understood in this art. The characters are usually printed line by line, a complete word or syllable being printed during each key operation. The strip of paper is, therefore, advanced one step during each key operation.

The paper feeding device comprises a universal bar 14 arranged over the key levers at a point in front of the printing hammers 4 and fixed to a bell crank lever 15, the latter being pivotally supported by the pivot rod 3. The upwardly extending arm of this bell crank lever 15 is notched to receive a pin 16 (Figs. II, VII and VIII) projecting from the oscillatory drive member 17 of a paper feeding clutch. This drive member 17 is loosely mounted in a driven clutch member 18, the latter being secured to one end of the paper feeding roll 12. The drive member 17 oscillates freely in response to the movements of the universal bar, so as to impart a step by step movement to the paper feeding roll. When the oscillatory drive member 17 turns in the direction indicated by the arrow in Fig. VIII, the small spring pressed rollers 19 are firmly clamped in the tapering or wedge-shaped spaces between said drive member and the driven clutch member 18. Movement is then transmitted from the universal bar, through the drive member 17 and rollers 19, to the driven clutch member 18. The paper feeding roll 12 is secured to the driven clutch member 18 (Figs. VII and VIII), so as to advance one step when the oscillatory drive member 17 turns in the direction indicated by the arrow in Fig. VIII. During the reverse movement, when the drive member 17 moves oppositely to the direction indicated by the arrow in Fig. VIII, the small rollers 19 tend to move into the wide ends of the tapering spaces, and they do not transmit movement to the driven clutch member 18. In response to the oscillatory movements of the universal bar and drive clutch member 17, the paper feeding roll 12 turns step by step in the direction indicated by the arrow in Fig. VIII.

To positively prevent retrograde movement, a stationary clutch member 17′ (Figs. VII and IX) is arranged within a rotary clutch member 18′, secured to one end of the paper feeding roll 12. A pin 20 extending from the stationary clutch member 17′, is secured to a stationary side frame 21. Spring pressed rollers 19′ are arranged in the wedge-shaped spaces between the stationary clutch member 17′ and the rotary clutch member 18′. These small rollers 19′ allow the feed roll to turn in the direction indicated by the arrows in Figs. VIII and IX, but if an effort is made to reverse the direction of movement, the small rollers 19′, by tending to move toward the points of the wedge-shaped spaces will coöperate with the stationary clutch member 17′ to prevent such retrograde movement.

The roll of paper 10 is formed around a core provided at each end with a trunnion or journal 23 (Fig. I). These trunnions are rotatably mounted in recesses, as shown in Fig. I. The roll of paper is held in the machine by means of dogs 24 which frictionally engage the trunnions 23. Each dog 24 is pulled into frictional engagement with a trunnion 23, by means of a spring 25. The dogs 24 tend to prevent the roll of paper from turning, and the strip of paper 9 is, therefore, placed under tension during the paper feeding operations. A paper feeding roll 22 (Fig. II) coöperates with the feed roll 12 to pull the strip of paper 9 from the supply roll 10. It will be observed that the strip of paper, in passing partially around the small uncurling rod 11, is turned very abruptly in a direction opposite to the direction in which it was wound on the supply roll, the object being to uncurl the paper before it passes from the machine. This is accomplished by turning the tensioned paper abruptly at the uncurling rod 11, as shown in Fig. II, and jerking the paper onto said rod by quickly feeding the paper step by step. Some of the fibers of the paper are strained and broken at the uncurling rod 11, and owing to the manner in which the paper is turned at this point, it is uncurled or strained before it reaches the filing device.

To illustrate the preferred form of the invention, I have shown an automatic filing device including blades 26 and 27 located at points on opposite sides of the path of the paper and adapted to sever the paper after it passes from the printing, uncurling and feeding device. The blade 26 is closely fitted to an arcuate seat on an oscillatory blade holder, or filing member, 28. The arcuate blade 26 is secured to the blade holder 28, as shown most clearly in Fig. II. A filing pin 29 (Figs. II, IV and V) located below the oscillatory blade holder, or filing member, 28 is arranged to receive the small sections of paper severed by the blades 26 and 27. The oscillatory blade holder 28 is preferably recessed at 30 (Figs. II and IV) to receive the filing pin 29. When this blade holder moves downwardly from the position shown in Fig. II, the blades 26 and 27 coöperate with each other to cut the paper, and the blade holder 28 forces the severed piece of paper onto the filing pin 29. The blade 27 is preferably secured to an arm 31 (Fig. II), the latter being pivoted at 33. A spring 34, (Fig. II) connected to the arm 31, tends to force the blade 27 into the path of the arcuate blade 26. When the blade 26 occupies the elevated position shown in Figs. II and IV, an extension 35 projecting downwardly from said blade, is engaged by the spring pressed blade 27.

The filing device may be operated in response to movements of the printing keys, and it is preferably constructed to automatically cut the paper into a series of short uniform sheets, and to file said sheets in consecutive order on the filing pin 29. It will be noted that the combination of the paper straightening device and the filing device produces a very desirable result, for if the paper was not straightened, the small sheets passing from the cutting device would, on account of their tendency to recurl, be difficult to handle and difficult to file.

Briefly stated, the automatic filing device comprises an operating spring for moving the blade holder 28, means for transmitting energy from the printing keys to said operating spring, so as to place the latter under the required degree of tension, and a restoring spring for returning the blade holder 28. The operation of the filing device is controlled by a timing device which moves step by step in response to movements of the printing keys, and upon the completion of a predetermined number of key operations, the timing device reaches a position wherein it will permit the operating spring to actuate the movable blade holder 28, at the same time placing the restoring spring under tension. During this operation, the movable blade holder is released from the operating spring, thus permitting the restoring spring to return said movable blade holder.

Journals 36 and 36′, extending from the ends of the oscillatory blade holder 28 (Figs. I, II and IV) are mounted in suitable bearings, and an operating arm 37 is secured to the journal 36. A restoring spring 38 (Fig. I) tends to retain the arm 37 in engagement with an abutment 39, and this restoring spring normally holds the oscillatory blade holder in an elevated position above the path of the paper. A trippable operating member 40 (Fig. I) is provided with a projection 41 adapted to strike an abutment 42 on the arm 37. This trippable member 40

is pivotally connected to a long lever 43, the latter being pivotally supported at 44 and provided with an abutment 45 which engages a timing cam 46. 47 designates an operating spring (Fig. I) connecting the lever 43 to a stationary part of the machine. The timing cam 46 moves step by step in response to operations of the printing keys, as will be hereinafter described, thereby moving the long lever 43 and placing the operating spring 47 under a gradually increasing tension. When the shoulder 46′, on the timing cam 46, reaches the corner 45′ of the abutment 45, the operating spring 47 pulls the trippable operating member 40 downwardly, thereby causing the projection 41 to strike the abutment 42 on the arm 37. This causes the arm 37 to turn about the axis of the journal 35 to which it is secured, and since the movable blade holder 28 is also fixed to said journal, the blade holder will move downwardly to sever the paper and to force the severed sheet onto the filing pin 29. The restoring spring 38 is placed under tension during the filing operation, however, this spring is not effective until the trippable operating member 40 is disengaged from the abutment 42 on the arm 37. The means for releasing the trippable member 40 comprises a cam face 48 formed on said member 40 and engaging a roller 49. 50 designates a spring connecting the trippable member 40 to a stationary part of the machine, and tending to force the cam face 48 into engagement with the roller 49. During the downward movement of the trippable member 40 its cam face 48 moves along the roller 49, so as to release said trippable member from the abutment 42 on the arm 37, thus permitting the restoring spring 49 to return the arm 37 and movable blade holder 28, the latter being provided with the journal 36 to which the arm 37 is secured. The operating spring 47 (Fig. I) is of sufficient strength to actuate the filing device and at the same time place the restoring spring 38 under tension.

Fig. I illustrates the automatic mechanism as it appears immediately before the filing operation, the shoulder 46′ on the timing cam 46 being located very close to the corner 45′ on the lever 43, and the trippable operating member 40 being so high that its projection 41 lies above the abutment 42. When this operating mechanism is released by the timing cam 46, the trippable operating member 40 is pulled downwardly by the operating spring 47 until the stop finger 51 (Fig. I) on the lever 43 engages a padded abutment 52. The trippable operating member 40 then occupies its lowest position, and the spring 38 is permitted to restore the arm 37 very quickly. Thereafter the timing cam 46 continues to turn in response to the key operations, and the long lever 43 is actuated to gradually lift the trippable operating member 40, the latter moving upwardly until its projection 41 lies directly above the abutment 42.

The means for actuating the timing cam 46 includes a large gear wheel 53 (Fig. I) fixed to the timing cam, and a pinion 54 meshing with said large gear wheel. The pinion 54 is secured to a shaft 55 projecting from one end of the paper feeding roll 12. This shaft 55 is shown in Figs. I and VII. It will now be understood that motion is transmitted from the key levers, through the universal bar, paper feeding device, pinion 54, and thence through the gear wheel 53 to the timing cam 46. The timing cam, therefore, advances one step in response to each key operation, and since said cam is operated through the medium of the paper feeding device, it will be apparent that the filed sheets will be uniform in length.

The filing pin 29 is preferably secured to a holder 56 arranged transversely of the machine and detachably secured thereto. Friction springs 57 bearing upon the end portions of the holder 56, yieldingly secure said holder in the machine. The filed sheets of paper may be readily removed when the holder 56 is withdrawn from the machine.

When it is desirable to operate the machine continuously without cutting and filing the paper, the operator can render the filing device ineffective by locking the long lever 43 (Fig. I) in an inoperative position. This is accomplished by forcing a hook-shaped latch 59 (Fig. I) into operative engagement with a pin 60 on the lever 43. A finger 61, extending downwardly from the lever 43, may be engaged and manipulated to locate the pin 60 at a point near the hook at the upper end of latch 59, and the latter may then be manipulated to coöperate with the pin 60 in holding the lever 43 in an inoperative position. The timing cam 46 may then be rotated continuously without in any way affecting the filing device. A spring 62 normally holds the latch 59 in the position shown in Fig. I, and when this latch is hooked onto the pin 60 it may be easily released by moving the finger 61 downwardly, thus moving the pin 60 downwardly and permitting the spring 62 to restore the latch 59 to the position shown in Fig. I.

A filing key 63 (Fig. I) may be operated at any time to cut and file the paper, without in any way disarranging the automatic mechanism. The filing key I have shown is in the form of a bell crank lever pivoted at 64 and connected by means of a link 65 to a crank 66, the latter being loosely mounted on the journal 36. The movable blade holder 28 is fixed to this journal 36. When the filing key 63 is depressed, motion is transmitted through the link 65 and crank

66 to the operating arm 37, thereby actuating the movable blade holder, as will be hereinafter more fully described, to cut the paper and to force the severed sheet onto the filing pin 29.

When the latch 59 (Fig. I) is engaged with pin 60 to hold the lever 43 in an inoperative position, the trippable operating member 40 is located in an elevated position, where it will not prevent the filing device from being actuated by the filing key 63. The filing key can also be actuated at any time when the automatic mechanism is in its operative condition. The operating arm 37 on the journal 36 (Fig. I) is actuated by the filing key 63, and the restoring spring 38 is utilized to restore the movable blade holder when the filing key is released. A restoring spring 65′ tends to retain the filing key in the position shown in Fig. I.

If the filing key is actuated when the projection 41, on the trippable operating member 40, is in the path of the abutment 42, the latter in moving downwardly will strike the projection 41 and force it out of the way. During the return stroke of the oscillatory arms 37 and 66, a cam 67 carried by the crank arm 66 will move upwardly in advance of the abutment 42 so as to prevent the latter from being stopped by the projection 41. When the filing key is actuated, the lower portion of cam 67 engages the abutment 42 to transmit movement to the operating arm 37. It is to be understood that the cam 67 on the loose crank arm 66 performs no useful function when the filing device is actuated by the automatic mechanism, and if the filing key 63 is actuated when the automatic mechanism is in the position shown in Fig. I, the cam 67 will perform no useful function. However, if the filing key is actuated when the projection 41 lies below and in the path of abutment 42, the abutment 41 must be shifted and held out of the way to permit the abutment 42 to return to its normal position, and this shifting operation is performed by the cam 67.

The strip of paper 9 which unwinds from the roll may be provided with consecutive numbers at regular intervals, as shown in Fig. III. The dotted lines in this view do not appear on the paper; they merely indicate the points at which the paper is to be severed by the automatic filing device. The consecutive numbers on the paper serve as page numbers for the filed sheets, and if the sheets are accidentally disarranged, the page numbers will clearly indicate the order in which they are to be replaced. When the paper is properly arranged in the machine, the cutting elements of the automatic filing device will sever the paper at the points indicated by dotted lines (Fig. III) as previously suggested, and a page number will appear on each filed sheet. It is sometimes desirable to cut the paper by hand, while the automatic device is in its operative condition, and this hand operation may be performed by means of the filing key 63 without moving the timing cam 46. When the timing device is set to cut the paper at the predetermined points, the filing key may be actuated at irregular intervals, and these cutting operations will not prevent the automatic device from continuing to cut the paper at the predetermined points. The filing key can be actuated at any time without changing the relation between the numbered strip of paper and the timing device.

The automatic cutting device herein disclosed is claimed in an application for patent filed by me on Nov. 18, 1916, Serial Number 132,071; and also in an application filed by me on Dec. 8, 1917, Serial Number 206,180, the broadest claims being in the earlier application. The hand operated cutting means, whereby the cutting elements are actuated independently of the printing keys, is claimed in an application filed by me on Dec. 8, 1917, Serial Number 206,181. The paper feeding device is claimed in an application for patent filed by me on May 19, 1917, Serial Number 169,621. The paper straightener is claimed in an application filed by me on May 19, 1917, Serial Number 169,620. The printing elements including the key levers and the details of construction in the key lever mounting are claimed in an application filed by me on Dec. 8, 1917, Serial Number 206,182.

I claim:—

1. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, a keyboard provided with keys whereby both of said devices are actuated, a filing device for dividing the paper into sections and filing said sections, and operating means under the control of the operator for actuating said filing device, said filing device and said operating means being so constructed and arranged that the printing device and paper feeding device may be actuated to print lines of characters on the paper without actuating said filing device, and said operating means being operable at the will of the operator to file sections of paper having a number of lines of characters printed thereon.

2. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, a keyboard provided with keys whereby both of said devices are actuated; and a filing device including a cutter for

dividing the strip of paper into relatively small sections after it passes from said printing device, a file whereby said sections are held in consecutive order, and operating means for actuating said filing device, said operating means being operable independently of said keys and the latter being operable independently of said filing device.

3. In a shorthand machine adapted to receive a strip of paper, a printing device including printing keys for printing lines of characters on the paper, a paper feeding device for feeding the paper step by step, said paper feeding device being operable by said printing keys, a filing device for filing the paper after it passes from said printing device, and a filing key whereby said filing device is actuated.

4. In a shorthand machine adapted to receive a strip of paper, a printing device including printing keys for printing lines of characters on the paper, a paper feeding device for feeding the paper step by step, said paper feeding device being operable by said printing keys, a filing device for filing the paper after it passes from said printing device, and a filing key whereby said filing device is actuated, said filing key being operable independently of said printing keys.

5. In a shorthand machine adapted to receive a strip of paper, a printing device including printing keys for printing lines of characters on the paper, a paper feeding device for feeding the paper step by step, said paper feeding device being operable by said printing keys, a filing device for filing the paper after it passes from said printing device, and a filing key whereby said filing device is actuated, said filing key being operable independently of said printing keys, and said printing keys being operable independently of said filing key.

6. In a typewriting machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step to and from said printing device, and an automatic filing device whereby the paper is divided into sections and filed, said automatic filing device including a universal bar through which movement is transmitted from said keys.

7. In a typewriting machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step to and from said printing device, a filing device for dividing the paper into sections and filing said sections, and means for actuating said filing device automatically upon the completion of a number of key operations, said means including a universal bar through which movement is transmitted from said keys to said filing device.

8. In a typewriting machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step to and from said printing device, a filing device for dividing the paper into sections and filing said sections, means for transmitting movement from said keys to said paper feeding device, and means for transmitting movement from said paper feeding device to said filing device, so as to actuate said filing device automatically in response to movements of said keys and paper feeding device.

9. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, finger keys whereby both of said devices are actuated, and an automatic filing device for filing the paper, said automatic filing device being operable in response to movements of said finger keys.

10. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, finger keys whereby both of said devices are actuated, and means whereby the paper is divided into substantially uniform sections and filed after it passes from said printing device, said means including a filing device operable automatically upon the completion of a predetermined number of key operations.

11. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, finger keys whereby both of said devices are actuated, and means whereby the paper is divided into sections and filed after it passes from said printing device, said means including a filing device, and means for transmitting movement from said finger keys to said filing device.

12. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, finger keys whereby both of said devices are actuated, and means whereby the paper is divided into sections and filed after it passes from said printing device, said means including a filing device, and means for transmitting movement from said finger keys to said filing device, the last mentioned means including an operating member mov-

able step by step in response to movements of said keys, so as to actuate the filing device upon the completion of a predetermined number of key operations.

13. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a timing device movable step by step in response to movements of said keys.

14. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a timing device movable step by step in response to movements of said keys, said keys being movable simultaneously to print a line of characters, and said timing device being movable only one step in response to each printing operation irrespective of the number of keys used in performing the printing operation.

15. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including an operating spring, and means for transmitting energy from said keys to said operating spring.

16. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including an operating spring, and means for transmitting energy from said keys to said operating spring, the last mentioned means including a transmission member movable step by step in response to operations of said keys.

17. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including an operating spring and means for gradually stretching said spring, the last mentioned means being movable step by step in response to operations of said keys.

18. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including an operating spring, and means for transmitting energy from said keys to said spring, the last mentioned means including a controlling device whereby the operating spring is permitted to become effective upon the completion of a predetermined number of key operations.

19. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device comprising a movable filing member, a spring tending to move said filing member, and means for releasing said spring upon the completion of a predetermined number of key operations.

20. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device comprising a movable filing member, a spring tending to move said filing member, and means for releasing said spring upon the completion of a predetermined number of key operations, the last mentioned means including a controlling device movable step by step in response to the movements of said keys.

21. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device comprising a movable filing member, a spring tending to move said filing member,

and means for releasing said spring upon the completion of a predetermined number of key operations, the last mentioned means including a cam movable step by step in response to movements of said keys.

22. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device comprising a movable filing member, and a trippable actuating member therefor adapted to be released during the operation of said movable filing member.

23. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device comprising a movable filing member, an actuating member for shifting said filing member, and means for releasing said actuating member after it has shifted said filing member.

24. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including an operating spring and a restoring spring.

25. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a movable filing member, an operating spring for actuating said filing member, and a restoring spring for returning said filing member.

26. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a movable filing member, an operating spring for actuating said filing member, and a restoring spring for returning said filing member, and means for placing said operating spring under greater tension than said restoring spring.

27. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a movable filing member, an operating spring for actuating said filing member, and a restoring spring for returning said filing member, said operating spring being adapted to place the restoring spring under tension during the filing operation.

28. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a movable filing member, a drive member for operating said filing member, an operating spring for actuating said drive member, a restoring spring for returning said filing member, and means for releasing said drive member to permit the restoring spring to return said filing member after the filing operation.

29. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a movable filing member, an operating spring for actuating said movable filing member and restoring spring for returning said filing member, and means for transmitting energy from said keys to both of said springs.

30. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, keys for actuating said printing device, a paper feeding device for feeding the strip of paper step by step, and an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device including a movable filing member, an operating spring for actuating

said movable filing member and restoring spring for returning said filing member, and means for transmitting energy from said keys to both of said springs, the last mentioned means including a transmission member movable step by step in response to operations of said keys.

31. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, and a filing device whereby the strip of paper is divided into sections and filed after it passes from said printing device, said filing device including a filing member whereby the sections of paper are attached to the machine, and said filing member being movable so that the strips of paper may be readily detached therefrom.

32. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, and a filing device whereby the strip of paper is divided into sections and filed after it passes from said printing device, said filing device including a file to which the paper sections are secured, and said file being detachably secured to the machine.

33. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, and a filing device whereby the strip of paper is divided into sections and filed after it passes from said printing device, said filing device including an oscillatory cutter at one side of the path of the paper, a filing pin at the opposite side of said path, and means for actuating said cutter to sever the paper and to force the severed paper sections onto said filing pin.

34. In a typewriting machine adapted to receive a strip of paper, a printing device, keys for operating said printing device, and an automatic filing device for dividing the paper into sections and filing said sections after the paper passes from said printing device, said automatic filing device being operable independently of said keys, and said automatic filing device being movable in response to movements of said keys.

35. In a shorthand machine adapted to receive a strip of paper, a printing device for printing lines of characters on the paper, a paper feeding device for feeding the strip of paper step by step to and from said printing device, a keyboard provided with keys whereby both of said devices are actuated, a filing device for dividing the paper into sections and filing said sections, means for transmitting movement from said keys to said filing device, so as to actuate the latter automatically upon the completion of a number of key operations, and means under the control of the operator for actuating said filing device, the last mentioned means being operable independently of said keys.

36. In a typewriting machine adapted to receive a strip of paper, a paper feeding device, a printing device, keys for operating said printing device to print lines of characters on the paper, an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, and means for rendering said automatic filing device ineffective.

37. In a typewriting machine adapted to receive a strip of paper, a paper feeding device, a printing device, keys for operating said printing device, a filing device whereby the strip of paper may be divided into sections and filed after it passes from said printing device, automatic operating means for actuating said filing device, means for rendering said automatic operating means ineffective, and an auxiliary operating device whereby said filing device may be actuated to divide and file the paper when the automatic operating means is ineffective.

38. In a typewriting machine adapted to receive a strip of paper, a paper feeding device, a printing device, keys for operating said printing device, a filing device whereby the strip of paper may be divided into sections and filed after it passes from said printing device, automatic operating means for actuating said filing device, means for rendering said automatic operating means ineffective, and an auxiliary operating device whereby said filing device may be actuated to divide and file the paper when the automatic operating means is ineffective, said automatic operating means being movable in response to movements of said keys, and said auxiliary operating device being operable independently of said keys.

39. In a typewriting machine adapted to receive a strip of paper, a paper feeding device, a printing device, keys for operating said printing device to print lines of characters on the paper, an automatic filing device whereby the paper is divided into sections and filed after it passes from said printing device, said automatic filing device being provided with operating means including a transmission member whereby power is transmitted from said keys, and means for retaining said transmission member in an inoperative position, so as to render the automatic filing device ineffective.

40. In a typewriting machine adapted to receive a strip of paper, a paper feeding device, a printing device, keys for operating said printing device to print lines of characters on the paper, an automatic filing device whereby the paper is divided into sec-

tions and filed after it passes from said printing device, said automatic filing device being provided with operating means including a transmission member whereby power is transmitted from said keys, and a latch for retaining said transmission member is an inoperative position, so as to render the automatic filing device ineffective.

41. In a typewriting machine adapted to receive a strip of paper, a printing device, keys for operating said printing device, a filing device for cutting the strip of paper into sections and filing said sections, automatic means, operable by said keys, whereby the filing device is actuated at regular intervals, and auxiliary operating means whereby the filing device may be actuated without disarranging said automatic means.

42. In a typewriting machine adapted to receive a strip of paper, a printing device, keys for operating said printing device, a filing device for cutting the strip of paper into sections and filing said sections, automatic means, operable by said keys, whereby the filing device is actuated at regular intervals, and auxiliary operating means whereby the filing device may be actuated without disarranging said automatic means, said automatic means including a timing device movable step by step in response to the key operations, and said auxiliary operating means being free to move independently of said timing device.

43. In a typewriting machine adapted to receive a strip of paper, a printing device, keys for operating said printing device, a filing device for cutting the strip of paper into sections and filing said sections, said filing device including an operating member provided with an abutment, automatic means, operable by said keys, whereby the filing device is actuated at regular intervals, said automatic means including a trippable operating member adapted to strike said abutment, and auxiliary operating means whereby the filing device may be actuated independently of said automatic means, said auxiliary operating means including a device whereby the trippable operating member is shifted away from the path of said abutment.

44. In a typewriting machine adapted to receive a roll of paper, a printing device, a filing device, a paper feeding device for feeding the paper from the roll to said printing device and then to said filing device, and a paper straightener coöperating with said paper feeding device to straighten the paper before it reaches said filing device.

45. In a typewriting machine adapted to receive a roll of paper, a printing device, a filing device, a paper feeding device for feeding the paper from the roll to said printing device and then to said filing device, a paper straightener coöperating with said paper feeding device to straighten the paper before it reaches said filing device, and keys whereby said printing, filing, and paper feeding devices are actuated.

In testimony that I claim the foregoing I hereunto affix my signature.

WARD S. IRELAND.