J. C. DOANE.

TYPE WRITING MACHINE.

APPLICATION FILED MAR. 23, 1911.

1,196,529. Patented Aug. 29, 1916.

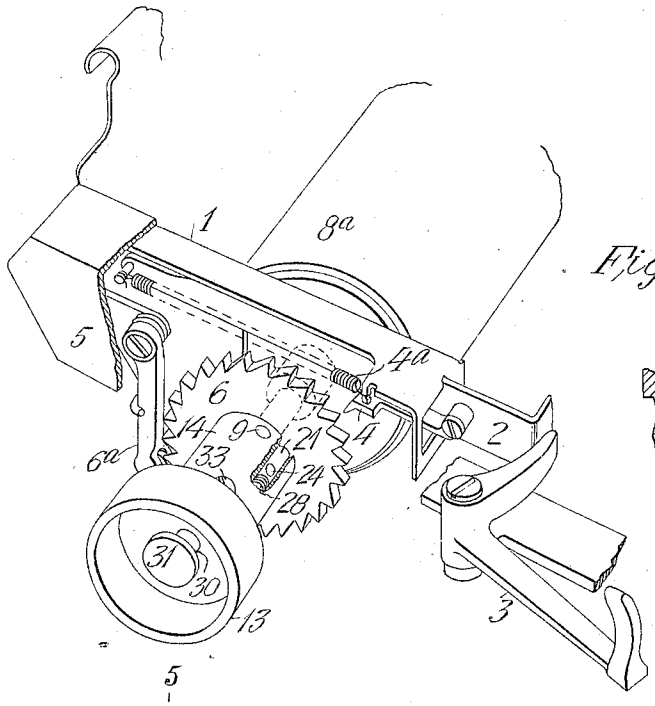


Fig. 1

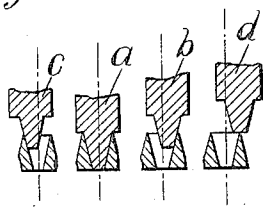


Fig. 8

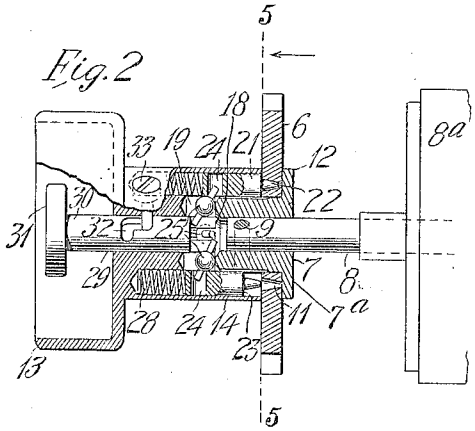


Fig. 2

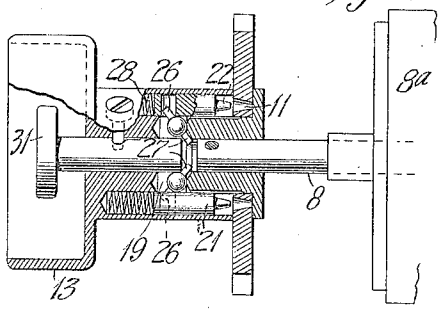


Fig. 3

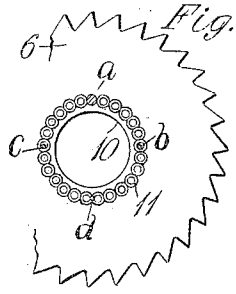


Fig. 4

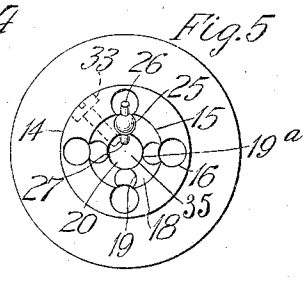


Fig. 5

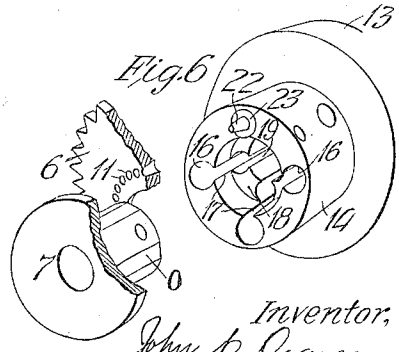


Fig. 6

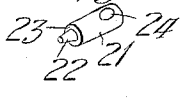


Fig. 7

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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

1,196,529. Specification of Letters Patent. Patented Aug. 29, 1916.

Application filed March 23, 1911. Serial No. 616,335.

To all whom it may concern:

Be it known that I, JOHN C. DOANE, a citizen of the United States, residing in Hartford; in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

The present invention relates to mechanism for clutching the platen of a typewriting machine to the line spacing device to provide for the usual uniform line-spacing of the platen; and for releasing the platen from the line-spacing device to permit of independent movement of the two, so that fractional or irregular adjustment of the platen may be effected when desired.

The object of the invention is to provide, for the purpose stated, a clutch which will grip the platen to the line-spacing device in substantially every position to which the platen may be turned; and which, in so gripping the platen, will not disturb the adjustment thereof, but on the contrary, will hold the platen positively in such manner that no play of the parts or disturbance of the adjustment can take place until the clutch is again operated to release the platen for another adjustment.

Other features and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective, showing a portion of the platen frame and platen, certain parts being broken away. Fig. 2 is a longitudinal central section through the platen releasing device, partly broken away, and showing a portion of the exterior of the mechanism. This view shows the releasing device in its locking position with the platen secured to rotate with the ratchet wheel. Fig. 3 is a view similar to Fig. 2, but showing the releasing device in its open or released position. Fig. 4 is a side elevation of the ratchet wheel, the inner face thereof indicating the arrangement of the perforations which cooperate with the pins to lock the platen to the ratchet wheel; a portion of the ratchet being broken away. Fig. 5 is a view in cross section on the line 5—5 of Fig. 2 looking in the direction of the arrow, certain parts being omitted. Fig. 6 is a perspective showing the inner end of the sleeve which carries the locking pins, and showing also a fragment of the ratchet wheel, and of the bushing or sleeve on which the ratchet wheel is mounted. Fig. 7 is a perspective of one of the pins for locking the platen to the ratchet or line-spacing wheel. Fig. 8 is a view illustrating the relative positions of locking pins and pin holes in one adjusted position of the platen.

Mounted in the carriage 1 is the platen shaft 8, carrying the platen 8^a, the hand wheel 13, and the line-spacing wheel 6. The line-spacing movement of wheel 6 is effected as in the Underwood machine by means of a pawl 4 carried by a slide 2 which is operated by a line-spacing lever 3. A spring 4^a returns the slide to normal position after each operation; and a spring detent 6^a holds the line-spacing wheel with the platen in the positions to which the same are fed.

The hand wheel 13 is made fast to the platen shaft by means of a pin 9 which engages the shaft and extends through a hub or sleeve 14 integral with the hand wheel. The line spacing wheel 6 is not mounted directly upon the shaft 8, but has its bearing upon a sleeve 7 fitted within the sleeve 14. The pin 9 passes through the sleeve 7 as well as the sleeve 14, so that the two sleeves are locked together and act as a unit with the platen and platen shaft in the operation of the device. The sleeve 7 projects beyond the end of the sleeve 14 and is provided with a flange 7^a between which and the end of the sleeve 14, the line-spacing wheel is held against lateral displacement.

The line-spacing wheel is normally locked to the sleeve 14, and consequently to the platen, by means of a number of detents in the form of lock pins or dogs 21 carried by the sleeve 14, and normally held by means of springs 28 in such position that their ends engage in corresponding pin holes or pockets 11 in the face of the line-spacing wheel. The lock pins or dogs 21 are mounted to have longitudinal movement in the sockets 16 in the sleeve 14 so that they may be moved to and from the face of the ratchet wheel.

To release the platen and the hand wheel from the ratchet wheel, the lock pins 21 are shifted longitudinally in the recesses or sockets 16, away from the ratchet wheel and against the action of the coil springs 28; and, to effect this shifting operation, the following means is provided: Held in recesses 19 in the sleeve 14, beyond the inner end of the sleeve 7, (see Figs. 2 and 6) are a number of rockers 25, one for each

lock pin. These rockers each comprises a central bearing or ball having a teat or arm projecting radially from each side thereof. The ball portion of each rocker is contained within one of the recesses 19. The outer teat 26 of each rocker projects through a slot 17 (see Fig. 6) and engages loosely in an eye or recess 24 in the opposing lock pin. The inner teats 27 of the rockers project through slots 19^a and converge into a central bore or plunger chamber 35. These rockers, in operation, are levers centrally fulcrumed on the end of sleeve 7.

The lock pins are shifted simultaneously in releasing the platen from the ratchet wheel; and, to this end, there is provided a plunger 30 which is movable longitudinally in the chamber 35 and which is adapted at its inner end to engage the converging arms 27 of the several rockers 25. The outer end of the plunger 30 protrudes beyond the outer face of the hand wheel and carries a push button 31 by means of which the plunger may be pressed inward when it is desired to unlock the platen from the ratchet wheel. When the plunger 30 is so operated, it engages the converging rocker arms and swings the rockers to Fig. 3 position, thereby causing the lock pins to be withdrawn from the pin holes 11 in the ratchet wheel. So long as the plunger 30 is held in Fig. 3 position, the platen and hand wheel are free to be turned independently of the ratchet wheel.

In order that the released condition of the platen may be maintained without necessitating continued hand pressure on the plunger 30, there is provided a bayonet joint connection between the sleeve 14 and the plunger 30, consisting of a bayonet slot 32 in the side of the plunger stem, and a pin 33 carried by the sleeve 14 to engage with this slot. To hold the platen mechanically in released position to push button 31 after being pressed inward is given a part turn to cause the pin 33 to enter the offset portion of the bayonet joint slot.

To lock the platen to the line-spacing wheel after the adjusting operation, it is only necessary to release the pressure upon the push button; or, in event the bayonet joint is holding the push button, to give the latter a part turn to released position. When the pressure on the plunger is thus relieved, the springs 28 throw the lock pins into the opposing pin holes 11 in the ratchet wheel; and the lock pins in making this movement swing the rockers in such manner as to cause the arms 27 thereof to force the plunger outward to normal position. The end walls of the slot 32 by engagement with the pin 33 act as stops to determine the throw of the plunger.

The lock pins fit closely in their recesses 16 so that lateral play of the pins with the ratchet wheel, and consequent misadjustment of the platen, is prevented. The pin recesses 16 are shown as intersecting the counterbore 15, to form the slots 17; and the close fitting lock pins slightly protrude into the counterbore. In order that the sleeve 7 in the counterbore may not interfere with the lock pins, the side of the sleeve is chamfered as at 0 at points opposite the slots 17.

In the embodiment of the invention herein specifically described there are but four locking pins 21, whereas there are twenty-five lock pin holes 11. The latter are annularly arranged, the ring of perforations being concentric with the platen shaft, and have their centers at precisely equal angular distances from each other. The diameters of the pin holes at the face of the wheel are preferably such that the peripheries of two adjacent holes are tangential. The locking pins 21 are positioned 90° apart on the sleeve 14. Since the number "four" representing the pins is divisible $6\frac{1}{4}$ times, and not evenly, into the number "twenty-five" representing the pin holes, it is obvious that, whatever may be the adjusted position of platen with respect to the ratchet wheel, one only of the lock pins can in any particular instance be truly centered in its opposing pin hole 11; if any one of the pins is so centered, the other three pins must each be more or less off center according to its distance from the centered pin. The ends of the pins, as well as the pin holes, are of conical formation as shown in the drawings, so that even though a locking pin may not be truly centered with one of the pin holes, it may nevertheless, protrude to some extent into the opposing pin hole; except when, as in the case of the lower pin in Fig. 2, the end of the pin bears against the ratchet wheel between two adjacent pin holes.

From a careful examination of the disposition of the pins with respect to the pin holes (see Figs. 7 and 8) it will be noted that if one pin (*a*) is fully centered, then the pins (*b*) and (*c*) immediately to the right and left of (*a*) will both be off center in their respective pin holes an amount equal to one fourth of the distance between two adjacent pin hole centers; and the pin (*d*), which is 180° from the centered pin, will be off center a distance equal to one half the distance between adjacent pin holes, or in other words, the pin (*d*) will bear upon the face of the ratchet wheel between two pin holes (see lower pin Fig. 2). The pins *b* and *c* each protrude to some extent into their opposing pin holes 11, and engage the pin holes on opposite sides of the center thereof. The Fig. 2 position illustrates only one particular adjustment; and it may be that the adjustment will be such that none of the pins will precisely center with a pin hole, in which event each of the pins will engage its

opposing pin hole to a greater or less depth according to the distance the pin may be off center by reason of the adjustment.

It will be apparent that if but a single pin were employed, it would hold the platen in adjusted position only in event it should happen to be precisely centered in its pin hole. At other times it would permit the platen to be disturbed sufficiently to cause the pin to center in its hole; and in fact, the spring pressure of the pin on the tapered side of the pin hole might tend to cause this disturbing movement of the platen. Similarly if there were two or more pins, so spaced that with certain platen adjustment they could all be off center in the same direction, there would be the same insecure hold on the platen, and liability of the latter to disturbance. Where, however, as in the present invention, the relative number and position of the pins and pin holes is such that there will invariably be a pin on one side of one hole and another pin on the other side of another hole, there can be no disturbing movement of the platen. The pin off center on the right hand side of one hole acts conjointly with pin off center on the left hand side of another hole to hold the platen positively against movement in either direction; the platen is actually clamped between the two pins, and nothing except the releasing operation can disturb the adjustment.

The taper or pitch of the cones formed by the pins and pin holes is steep, so that no effort to turn the platen relatively to the ratchet can result in crowding the pins out of the pin holes. A positive locking is therefore obtained without the use of other means for holding the pins in locking position. The pins are preferably not pointed, but are squared off at their ends, thus being strong and substantial notwithstanding the pitch of the cones. The arrangement and number of the pins and pin holes makes it unnecessary to point the pins in order to obtain a sufficient number of locking positions; for as illustrated in Fig. 8, a positive locking will be obtained even though one of the pins rides on its squared end without entering any hole. The pin holes preferably extend entirely through the ratchet wheel (see Fig. 2), and a long bearing is therefore provided for the pins. The conical portion of each pin terminates at a shoulder 23, which by engagement with the face of the ratchet wheel may serve as a positive stop for the pin, as indicated by the upper pin in Fig. 2.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a platen release, in combination, a platen, a line-space wheel co-axial therewith and having a plurality of annularly disposed perforations, a pin-carrier adjacent to said ratchet wheel, a plurality of pins guided longitudinally therein and adapted to engage said perforations, a plunger mounted in said pin-carrier and adapted to slide inwardly, and rockers engaging said pins and said plunger to withdraw said pins.

2. In a platen release, in combination, a platen, a line-space wheel co-axial therewith and having a plurality of perforations, a sleeve mounted adjacent to said wheel, said sleeve having a pin socket, a pin guided longitudinally in said socket and adapted to engage said perforations, said sleeve having a bore therein, a plunger mounted to slide longitudinally in said bore, said sleeve having a pocket between said socket and said bore, and a rocker received in said pocket engaging said pin and projecting into the path of said plunger, whereby the longitudinal movement of said plunger may withdraw said pin.

3. In a platen release, in combination, a platen, a wheel co-axial therewith and having a plurality of perforations, a sleeve mounted adjacent to said wheel, said sleeve having a pin socket adapted to be brought into alinement with said perforations, a pin guided longitudinally in said socket and adapted to engage said perforations, said sleeve having a bore therein, a plunger mounted to slide longitudinally in said bore, said sleeve also having a pocket between said socket and said bore, a rocker received in said pocket engaging said pin and projecting into the path of said plunger, whereby the longitudinal movement of said plunger may withdraw said pin, and means tending to hold said pin in engagement with said wheel.

4. In a platen release, in combination, a platen, a wheel co-axial therewith and having a plurality of annularly disposed perforations, a sleeve having a plurality of guide sockets formed therein which may aline with said perforations, pins mounted to slide in said sockets, means tending to force said pins into engagement with said perforations, said sleeve having a bore therein, and a plurality of pockets formed in the wall of said bore, rockers mounted in said pockets engaging said pins, and a plunger mounted in said bore to withdraw the same.

5. In a platen release, in combination, a platen, a wheel co-axial therewith and having a plurality of annularly disposed perforations, a sleeve co-axial with said wheel and having a plurality of guide sockets formed therein, pins sliding in said guide sockets and having eyes formed therein, a plurality of rockers mounted in said sleeve and having arms engaging said eyes to with-

draw said pins, and a plunger mounted to slide in said sleeve to engage said rockers and withdraw said pins.

6. In a platen release, in combination, a platen, a wheel co-axial therewith and having a plurality of annularly disposed perforations, a sleeve co-axial with said wheel and having a plurality of guide sockets formed therein, pins sliding in said guide sockets and having eyes therein, a plurality of rockers mounted in said sleeve and having arms engaging said eyes to withdraw said pins, a plunger mounted to slide in said sleeve and engaging said rockers to withdraw said pins, and springs behind said pins forcing the same toward said wheel.

7. In a platen release, in combination, a platen, a wheel, a sleeve co-axial therewith, said wheel having a plurality of annularly disposed perforations, a plurality of pins mounted to slide in said sleeve and adapted to engage said perforations, said sleeve having a plurality of pockets formed therein and having a central bore communicating with said pockets, rockers mounted in said pockets having enlarged bodies with outwardly projecting arms engaging said pins to withdraw the same, and having inwardly projecting arms extending into said bore, and a sliding plunger mounted in said bore and engaging said last named arms for withdrawing said pins.

8. In a platen release, in combination, a platen, a wheel co-axial therewith, and having a plurality of annularly disposed perforations therein, a sleeve having a counter-bore co-axial with said wheel, and having a plurality of guide sockets therein, cutting through the wall of said counter-bore to form slots, said sleeve having pockets therein opposite said slots, pins slidable in said sockets, rockers mounted in said pockets and having arms projecting through said slots and engaging said pins to withdraw the same, and means for actuating said rockers to withdraw said pins.

9. The combination with a platen, of a line-space wheel therefor, pins spaced apart and movable along the axis of said platen to engage seats differently spaced in the line-space wheel to lock said platen to said line-space wheel at intervals equal to small fractions of a line-space, a button to move said pins, and means to lock said button by rotating it.

10. The combination with a platen fixed on its axle, of a line-space wheel loose on said axle, a collar fixed on said axle, pins closely fitting holes bored in said collar, and arranged to engage in seats in said line-space wheel, and a button for releasing said pins.

11. In a typewriting machine, the combination of a platen and a line-space wheel, means to connect said wheel to the platen comprising an annular series of tapered openings and a series of pins adapted to be projected into said openings, said pins being separately movable in a direction parallel with the platen axis into and out of holding position, said tapered openings permitting a differential movement of the pins to holding position.

12. In a typewriting machine, the combination of a platen and a line-space wheel, means to connect said wheel to the platen comprising an annular series of frusto-conical openings with their axes parallel with the platen axle, said openings forming inclined holding surfaces, and a plurality of pins having inclined surfaces to engage said first-named surfaces, and means to project said pins to bring said surfaces into engagement, the parts being so spaced that the pins are projected different engaging distances when in holding position.

13. In a typewriting machine, the combination with a platen, and a line-space wheel adapted for rotation relatively thereto, of means to connect said wheel to the platen comprising an annularly arranged series of frusto-conical openings and independently movable locking pins operable to engage said surfaces and lock said parts against relative rotation from any position of adjustment, and means to move said locking pins in a direction parallel with the platen axis into and out of locking position.

14. In a typewriting machine, the combination with a platen and a line-space wheel rotatable relatively thereto, of means to connect the said wheel to the platen comprising an annular series of tapered openings forming holding surfaces, and holding pins adapted for independent movement in a direction parallel with the platen axis into and out of engagement with said holding surfaces, said holding pins being so positioned relatively to each other and to said surfaces that when one holding pin engages an opening to hold said parts against relative rotation in one direction another of said pins holds the parts against relative rotation in the opposite direction.

15. In a typewriting machine, the combination with a platen and a line-space wheel, of means to connect the said wheel to the platen comprising an annular series of uniform tapered openings forming holding surfaces and locking pins movable into and out of engagement with said openings and positioned to engage different relative portions of said openings, and means for moving said pins in a direction parallel with the platen axis into engagement with said openings.

16. In a typewriting machine, the combination of a platen, a line space wheel connected therewith, means for connecting the line-space wheel to the platen comprising an odd number of pockets and an even number

of lock pins, and means for moving said pins relatively to and from said pockets, the said pockets being tapered so that the pins may enter into the same a distance depending upon the amount by which the pins may be off center with respect to the pockets, said taper being sufficiently steep to effect a positive engagement between said pin and pocket to connect the line-space wheel to the platen, and shoulders to hold said pins from jamming in said pockets.

17. The combination with a platen, of a line-space wheel therefor, pins for locking said platen to said line-space wheel, a hollow hand wheel for turning said platen, a button movable in and out in the direction of the platen axis within the confines of said hand wheel and operable by said movements to control said pins, and a bayonet slot and pin connection between said wheel and button for locking said button.

18. The combination with a platen fixed on its axle, of a line-space wheel loose on said axle, a collar fixed on said axle, said collar having cylindrical holes bored therein parallel with said axle, pins closely fitting said holes, tapered ends on said pins arranged to extend unequally into fixed tapered seats in said line-space wheel, springs seating said pins, and a button for releasing said pins.

19. The combination with a platen, of a line-space wheel therefor provided with locking surfaces, pins carried with the platen and movable into and out of holding contact with said locking surfaces for locking said platen to said line-space wheel, a hollow hand-wheel for turning said platen, a button located within said hand-wheel and manually movable to control said movements of the pins, and a bayonet slot and pin connection between said hand-wheel and button for locking said button.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."