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FIG. I.

This technical drawing, labeled FIG. I, shows a cross-section of a mechanical assembly. At the top, a rectangular frame (1) contains a large rectangular area defined by dashed lines. Below this frame, a horizontal bar (6) is positioned. On the left and right sides of the bar, there are vertical assemblies (17, 18, 19, 20, 21) that appear to be part of a carriage or support mechanism. A central vertical rod (7) passes through the bar (6) and is connected to a complex mechanism below. This mechanism includes two large circular components (5, 8) and a central vertical rod (3) that passes through them. The entire assembly is mounted on a base (2) which has a series of vertical rods (4) extending downwards. The drawing is labeled with various numbers (1, 2, 3, 4, 5, 6, 7, 8, 17, 18, 19, 20, 21) indicating different parts of the machine.

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Jan. 27, 1942.

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2,271,306

CONTINUOUS FORM FEEDING AND ALIGNING DEVICE

Filed April 29, 1941

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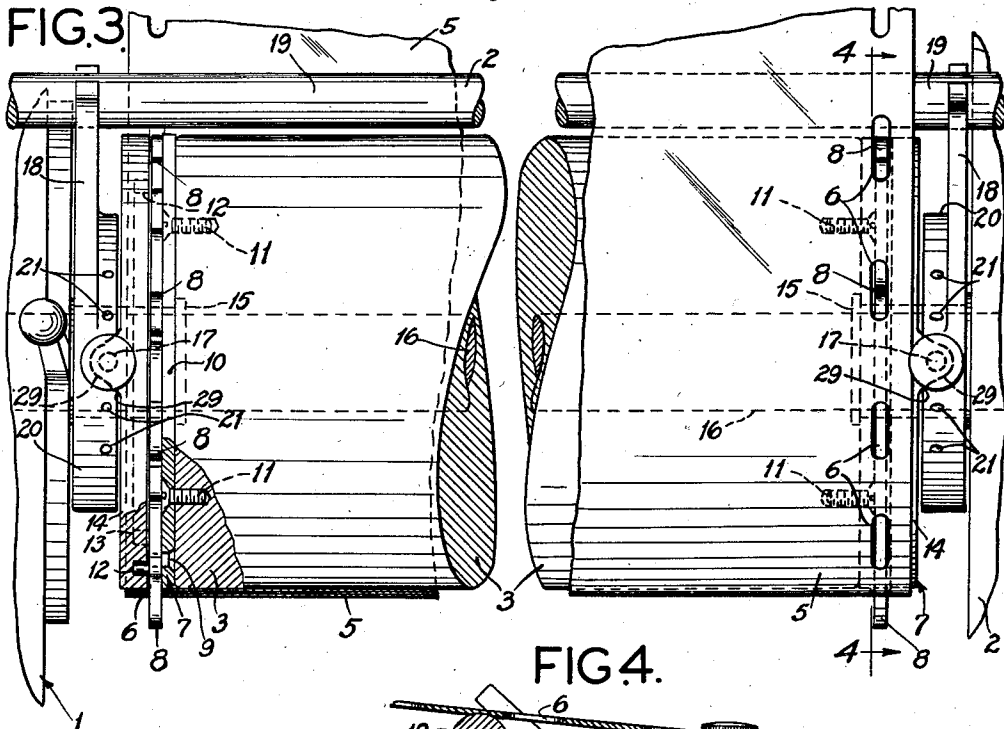
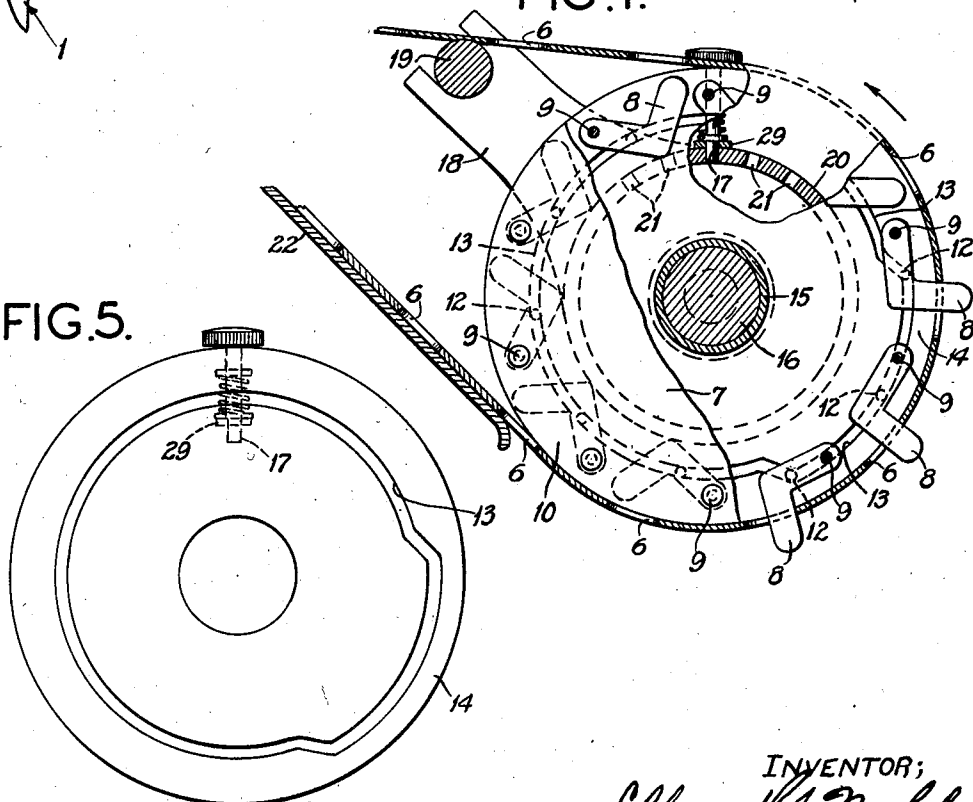


FIG.4.

FIG.5.



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FIG.6.

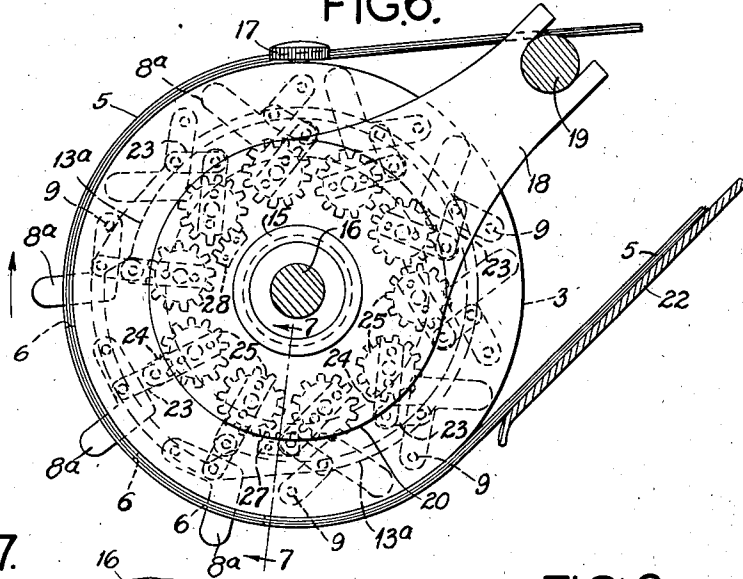


FIG.7.

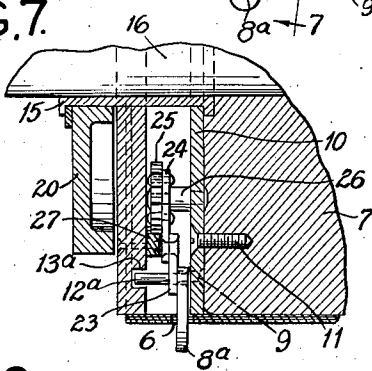


FIG.8.

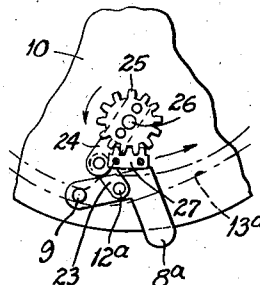
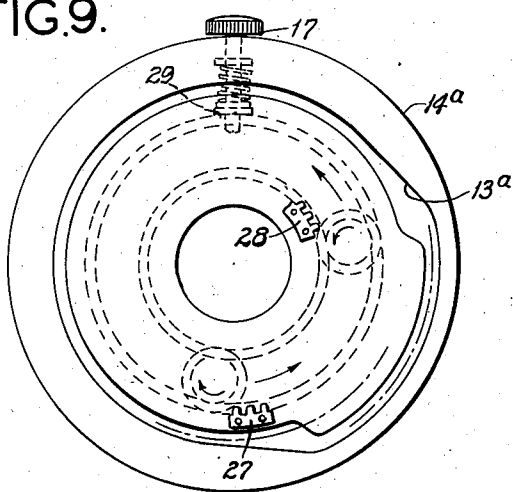


FIG.9.



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FIG.10.

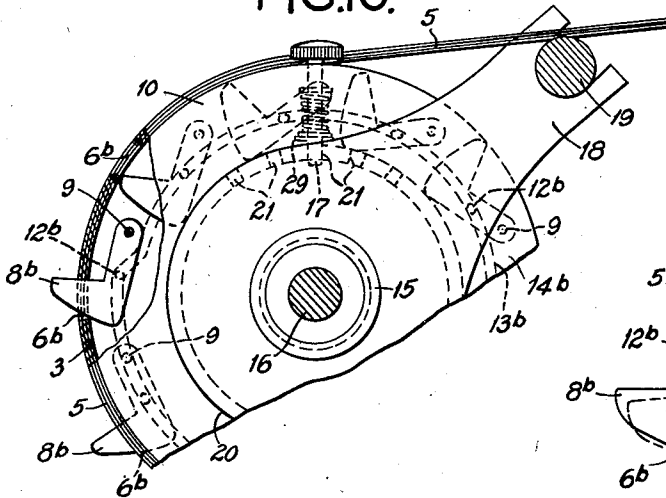


FIG.11.

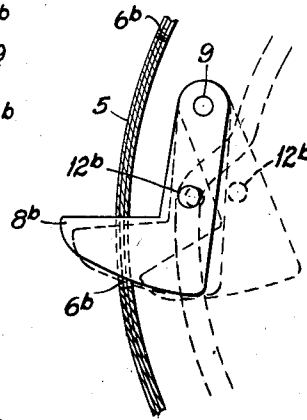
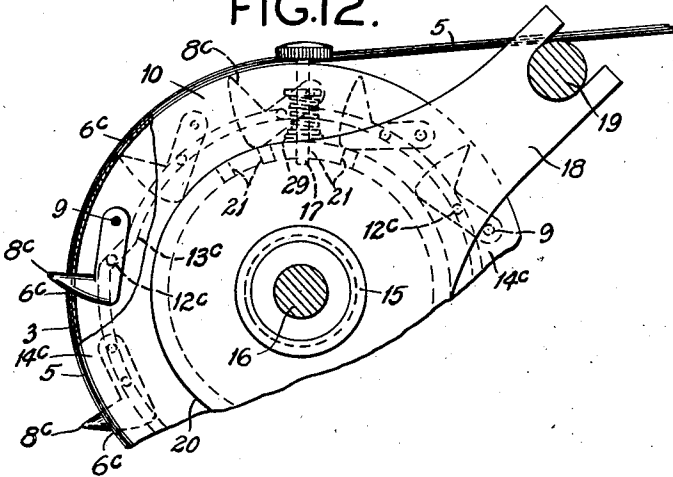


FIG.12.



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2,271,306

CONTINUOUS FORM FEEDING AND
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7 Claims. (Cl. 197—133)

My invention relates to feeding and aligning devices for continuous forms as they pass through a writing machine and, more particularly, to such devices which may be embodied in the platen of an ordinary typewriter or tabulator and including pins arranged to be projected from the platen surface into successive engagement with the marginal portions of the form contiguous to each of a longitudinally extending series of punched holes.

In devices of this type it is necessary, if the superposed parts of the form are to be maintained in proper alignment and registry as they are passed through the writing machine, that the pins engage the forward side of the punched holes so that, as the platen is rotated, the parts of the form will be moved evenly and simultaneously without any jogging or twisting which would tend to carry the various parts out of predetermined superposed position, particularly when a comparatively large number of parts are included in a single form.

The objects of my invention are to provide a pin type aligning device which may be embodied in the platen of a writing machine with efficacy; to provide such a device which will operate efficiently to move continuous forms through the machine and maintain the various parts thereof in proper alignment and registry; to provide a device which will be cheap to manufacture and easy to operate; and to provide a device of this kind which will have many points of superiority over those heretofore used.

In the accompanying drawings, wherein similar characters are used to designate similar parts, several different embodiments of devices including my invention have been shown. In these drawings: Fig. 1 is a plan view of a typewriter with the pin type feeding device as a component part of the platen; Fig. 2 is a section along the line 2—2 in Fig. 1; Fig. 3 is an enlarged view of the platen and its included device and with a continuous form threaded therearound, all as shown in Fig. 1; Fig. 4 is a staggered section taken generally along the line 4—4 in Fig. 3; Fig. 5 is a side view of one of the parts, as will be fully explained below; Fig. 6 is a view, similar to Fig. 2, of a modified embodiment of the device; Fig. 7 is a section along the line 7—7 in Fig. 6; Figs. 8 and 9 show details of the construction of this embodiment; Figs. 10 and 11 show details of a third embodiment; and Fig. 12 shows a variation of the embodiment of Figs. 10 and 11 wherein the feeding and aligning pins have been changed somewhat in shape.

Referring to the figures, and particularly to Figs. 1 to 5, inclusive, the typewriter 1 upon which my new and improved device is mounted has the usual carriage 2 for the platen 3 rotated by the knurled hand knobs 4. While, in the different embodiments shown and described in this application, my invention has been included in the platen of a typewriter, it should be understood that it may be adapted readily and easily for use with any kind of writing machine, such as tabulators, billers, or others having a platen around which passes a continuous form or other paper to receive written indicia.

In this instance, however, the continuous multipart form 5 is threaded around the platen 3 in the manner shown in Figs. 2 and 4 and has at each marginal edge thereof a longitudinally extending series of punched holes 6 which are elongated and, preferably, are otherwise shaped as illustrated in Figs. 1 and 3. At each end of the platen 3 is included an aligning unit 7 having an orbitally disposed and moving series of pins 8 adapted, when the platen is rotated, to enter successively into the holes 6 of a series and engage the forward or leading side of each hole to move the form 5 with the platen's surface.

As clearly shown in Figs. 2 and 4, the outer ends of the pins 8 throughout most of their orbital movement lie within the circumference of the platen 3 but for a portion of their orbit these pins are projected outwardly from the platen's circumference so as to enter the holes 6, as described. The mechanism for causing this projection and withdrawal of the pins comprises the following parts: Each of the pins 8, preferably, as shown, is shaped like a bell-crank and has one end pivotally mounted on a stud 9 carried by a plate 10 secured to an end of the platen 3 by any suitable means, such as screws 11, and, of course, rotating therewith. Extending from each pin 8 on the face thereof removed from the plate 10 is a knob 12, in this embodiment positioned between the end of the pin mounted on the stud and the elbow or curved portion thereof, but which may be positioned at other points in the pin's length. The knob 12 is arranged to move in and engage the side walls of a cam race or channel 13 formed in the plate 14 mounted, as on a hub 15 carried by the platen shaft 16, to remain stationary relative to the platen 3 as it rotates. That is, the plate 14 remains stationary relative to the fixed writing point of the machine. Obviously, when the platen is rotated the pins 8 will move orbitally and when the knobs 12 move in the portion of

the channel 13 having the smaller radius the free ends of the pins will remain in withdrawn position below or within the circumference of the platen. However, when the knobs 12 move into the comparatively short portion of the channel having the greater radius, the pins 8 will be rocked outwardly to cause the free ends thereof to project beyond the circumference of the platen and to swing into the elongated holes 6 in the continuous form 5 threaded around the platen. As shown in Figs. 2 and 4, the free ends of the feeding and aligning pins do not move radially outwardly but, as just described, swing into projected position and the leading edges of the pins do not contact the forward side of the holes 6 until the leading edges have assumed a radial position in which they engage simultaneously the contiguous edges of the registering holes in the various parts of the form. This manner of engagement is very important and is a step forward since it obviates the tendency, created by the other pin feeds heretofore used, to draw one or more of the superposed parts of the continuous form ahead of the other parts and, thereby, to carry the parts out of registry as the form moves around the curved platen.

Sometimes it may be desired to vary the relative point in the platen's circumference at which the pins 8 are projected therefrom and, of course, such variations may be effected by rotating the plate 14 and its included cam channel 13 in relation to the platen. The means for maintaining the plate 14 in such adjusted position may include the spring impelled detent 17 carried by and extending through the flange 29 fixed to the plate 14. The lower end of this detent is adapted to extend into one of a series of holes 21 in the cylindrical portion 20 of the part 18 which has a bifurcated arm engaging the tie rod 19 of the typewriter and through such engagement is prevented from rotating about the platen shaft 16. It will be evident, that when the detent 17 is lifted out of one of the holes 21 the plate 14 may be moved relative to the part 18 and to the platen 3 so that the portion of the cam channel having the larger radius will be moved to cause the pins 8 to be projected outwardly at the desired relative point on the platen's circumference as it is rotated. When the adjustment has been effected the detent is released and the spring thereon will cause the lower end thereof to enter the adjacent hole 21 in the cylindrical portion 20 of the part 18 and further movement of the plate 14 about the platen shaft will be prevented, as the device is operated.

Although the operation of this embodiment of my new and improved feeding and aligning device should be understood from the above description, particularly when taken with the accompanying drawings, for the sake of clarity a brief statement of such method of use and operation will be given here. After each unit 7 has been adjusted through the detents 17, as just described, to cause the pins 8 to be projected at the proper points in the platen's circumference, a multi-part continuous form 5 is threaded through the typewriter or other writing machine in which my device has been embodied and around the platen 3. A usual guard 22 may be provided to support the form as it approaches the platen, as shown in Figs. 2 and 4. At all times, of course, several of the pins 8 of each unit 7—in this embodiment three of the pins—will be projected from the circumference of the platen and, as the form 5 is threaded through

the machine, the holes 6 at each marginal portion of the form are registered with the projecting pins so that the forward side of each of the registering holes in each form part is engaged by the leading edge of a pin. When the form has been moved through the machine into proper position for writing, the desired indicia is typed thereon and then the knurled knobs 4 are manipulated to turn the platen to carry the form into the next writing position. When the platen is rotated the co-operating knobs 12 and cam channel 13 will cause the pins 8 to swing outwardly to enter successive holes 6 in the marginal portions of the form and the form will be carried with the platen and the various parts thereof during such movement will be maintained in proper registry and alignment. As stated above, in this embodiment the pins 8 swing outwardly as they are projected from the platen's surface and, therefore, the holes 6 must be elongated to accommodate the free ends of the pins during such swinging movement. It is desired to change the point on the circumference of the platen at which the pins 8 are projected, the detent 17 is lifted away from the cylindrical portion 20 of each unit 7 and the plate 14 is rotated relative to the fixed writing point of the machine to effect the wanted adjustment. If the feeding and aligning device is included in a power driven platen of a writing machine of a different type the operation will be the same. It should be noted that in the embodiment of my device shown in Figs. 1 to 5, inclusive, the feed pins 8 are both projected into form engaging position and withdrawn by the action of the knobs 12 in the cam channel 13.

In the modified form of device shown in Figs. 6 to 9, inclusive, however, the pins 8a are projected into form engaging position and are withdrawn therefrom by a positive gear drive and the cam action only guides them after they have been projected or withdrawn. Each pin 8a has a knob 12a co-operating with a cam race or channel 13a formed in the adjustable plate 14a. As clearly shown in Fig. 9, this cam channel is widened at the connections between the portions of smaller and larger radius so that the knobs at these transition points in their paths of travel are not moved outwardly or inwardly by the channel as the platen is rotated. In this embodiment the outward and inward movement of the pins 8a is effected in the following manner: Each pin 8a has extending therefrom a pivoted link 23 connected at its other end to a finger 24 fixed to a face of a small gear 25 mounted on a stud 26 on the plate 10. Fixed to the adjustable plate 14a at the outer periphery of the orbit of the pins 8a, is a rack 27 and at the inner periphery of the orbit is a rack 28. These racks are arranged and positioned to engage and mesh with the gears 25 as the platen on which they are carried rotates relative to the plate 14a on which the racks are mounted. When the platen is rotated in the direction indicated by the arrow in Fig. 9 the rack 27 will mesh successively with the gears 25 and will turn or rock them to cause the finger 24 to move the link 23 to swing the pins 8a into projected position, as shown in Fig. 8. Then, as rotation of the platen continues, the gears 25 will be carried successively into engagement with the rack 27 and the gears will be turned or rocked in a reverse direction to cause the pins 8a to be withdrawn. Complete rotation of the gears 25 in either direction is prevented by the knob 12a moving in the channel 13a. Except for this variation in the motivating mecha-

nism for the feeding and aligning pins, the operation of the embodiment illustrated in Figs. 6 to 9, inclusive, is the same as that of the previously described embodiment.

In the embodiment shown in Figs. 10 and 11 each of the pins 8b has the form engaging shank thereof arranged at substantially a right angle to the shank pivoted to the plate 10; each has the leading and rearward edges of the form engaging shank tapered to a blunt point; and each knob 12b and the co-operating cam channel 13b formed in the plate 14b are arranged and positioned so that when a pin is swung into projected position the end thereof passes through an arc including a round hole 6b in the multi-part form 5. In other words, with this embodiment of my invention it is not necessary to use elongated holes in the marginal portions of the form since the pins swing so that the tapered free shank will pass through the round hole 6b, as shown in Fig. 11 where the progressive movement of a pin has been illustrated. However, as also shown in this figure, it should be noted that the leading edge of the free shank of each pin 8b, even though it passes through a round hole 6b, does not engage the edges of the contiguous portions of the multi-parts of the form at the forward side of a hole until the pin has been projected fully outwardly and the leading edge of the free shank is extending radially of the platen.

The variation of the device shown in Fig. 12 is the same as that just described except that the form engaging shank of each pin 8c is tapered from all directions so as to be cone shaped but, otherwise, the pins 8c and the co-operation of the knobs 12c and the cam channel 13c in the plate 14c is such that the free shank of the pin will swing outwardly into engaging position within the area of a round hole 6c formed in the marginal portion of the continuous form 5, in the same manner as in the embodiment of Figs. 10 and 11.

In the accompanying drawings, as stated hereinbefore, I have shown several embodiments of feeding and aligning devices including my invention but, of course, I do not intend to limit myself to the embodiments shown herein. The shape of the pins, the method used for motivating them into projected and withdrawn positions, and the size, shape and arrangement of the other parts of the device may be varied within wide ranges without deviating from the spirit of my invention as bounded by the ambit of the appended claims.

What I claim as new and desire to secure by Letters Patent, is:

1. A continuous form feeding and aligning unit adapted to be included in the platen of a writing machine and comprising a plurality of form engaging pins pivotally mounted on said platen, each of said pins having a knob extending therefrom at a point removed from said pivot, a plate associated with said pins and being stationary relative to said platen, said plate having a cam channel formed therein and arranged to receive said knobs, and said pins and said plate being formed and positioned whereby said pins will be projected successively beyond the circumference of said platen into form engaging position and will be withdrawn therefrom as said platen is rotated.

2. A continuous form feeding and aligning unit adapted to be included in the platen of a writing machine and comprising a plurality of

form engaging pins pivotally mounted on said platen, each of said pins having a knob extending therefrom at a point removed from said pivot, a plate associated with said pins and being stationary relative to said platen, said plate having a cam channel formed therein and arranged to receive said knobs, and said channel having a portion of smaller radius and a portion of larger radius and being otherwise positioned and formed whereby said pins will be projected successively beyond the circumference of said platen into form engaging position and will be withdrawn therefrom as said platen is rotated.

3. A continuous form feeding and aligning unit adapted to be included in the rotatable platen of a writing machine and comprising a plurality of form engaging pins pivotally mounted on said platen, each of said pins having a knob extending therefrom at a point removed from said pivot, a plate associated with said pins and being normally stationary relative to the axis of the platen, a cam on said plate to engage said knobs whereby said pins will be projected successively into form engaging position and will be withdrawn therefrom as said platen is rotated, and adjustable means for moving said plate relative to the axis of said platen whereby the point on the circumference of said platen at which said pins are projected may be varied.

4. A continuous form feeding and aligning unit adapted to be included in the rotatable platen of a writing machine and comprising a plurality of form engaging pins pivotally mounted on said platen, each of said pins having a knob extending therefrom at a point removed from said pivot, a plate associated with said pins and being normally stationary relative to the axis of the platen, said plate having a cam channel formed therein and arranged to receive said knobs, said channel having a portion of larger radius and a portion of smaller radius and being otherwise positioned and formed whereby said pins will be projected successively beyond the circumference of said platen into form engaging position and will be withdrawn therefrom as said platen is rotated, and adjustable means for moving said plate relative to the axis of said platen whereby the portion of larger radius of said channel may be moved relative thereto and the point on the circumference of said platen at which said pins are projected may be varied.

5. A continuous form feeding and aligning unit adapted to be included in the rotatable platen of a writing machine and comprising a plurality of form engaging pins pivotally mounted on said platen, each of said pins being hooked shape and being pivoted near one end, a knob extending from each pin at a point between said pivoted end and the elbow of said hook, a plate associated with said pins and being normally stationary during the rotation of the platen, and a cam on said plate to engage said knobs whereby the free ends of said pins will be projected successively into form engaging position and will be withdrawn therefrom as said platen is rotated.

6. A continuous form feeding and aligning unit adapted to be included in the platen of a writing machine and comprising a plurality of pivotally mounted form engaging pins arranged to be swung outwardly beyond the circumference of said platen and then withdrawn from said projected position as said platen is rotated, each of said pins being shaped whereby in normal opera-

tion it does not engage said form until it has been projected fully, and positively acting motivating means actuated by rotation of said platen for swinging said pins successively both into and out of said projected, engaging position.

7. A continuous form feeding and aligning unit adapted to be included in the platen of a writing machine and comprising a plurality of form engaging pins pivotally mounted on said platen, each of said pins being hooked shape and having the free end thereof formed to swing outwardly

beyond the circumference of said platen into projected, form engaging position and to be withdrawn from said position, each of said pins being arranged whereby the leading edge thereof will extend radially of said platen when said pin is in full projected position, and a single, positively acting motivating means actuated by rotation of said platen for swinging said pins successively both into and out of said projected, engaging position.

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