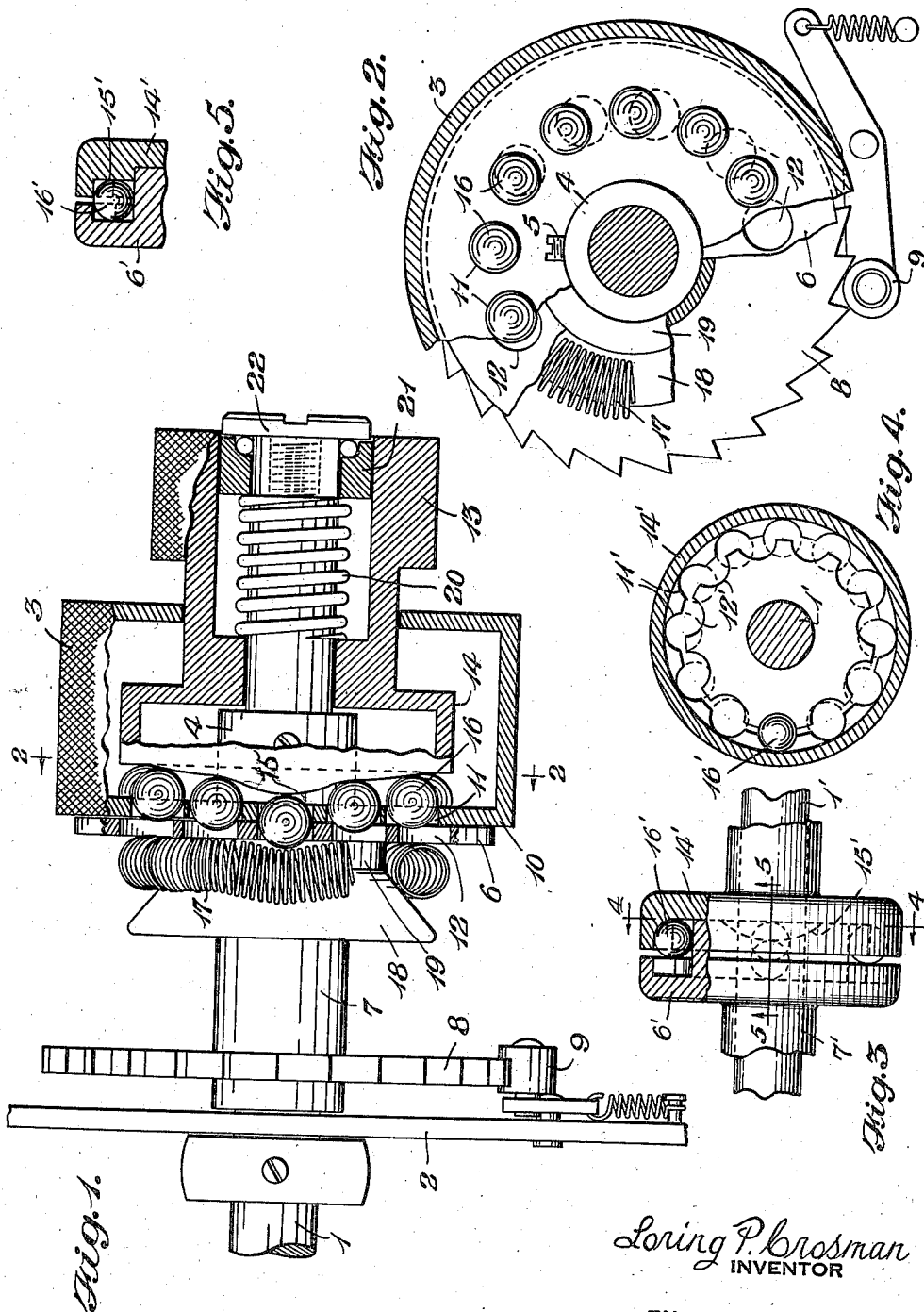


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L. P. CROSMAN
MECHANICAL MOVEMENT
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Loring P. Crosman
INVENTOR

BY
C. W. Anderson & Son
ATTORNEY

UNITED STATES PATENT OFFICE

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MECHANICAL MOVEMENT

Loring Pickering Crosman, Maplewood, N. J., assignor to Monroe Calculating Machine Company, Orange, N. J., a corporation of Delaware

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7 Claims. (Cl. 74—122)

The invention relates to mechanical movements, and particularly to means for obtaining vernier adjustments, an object of the invention being to provide improved means for obtaining fractional adjustments of the platen of a listing adding machine, typewriting machine and the like to the exact printing line independently of the line spacing mechanism.

The invention consists in the novel construction and combinations of parts as hereinafter set forth in the claims.

In the accompanying drawing, wherein the invention is shown as applied to the platen shaft of a listing adding machine,

Figure 1 is a side view of the invention as applied, with parts in section and parts broken away.

Figure 2 is a section on the line 2—2, Figure 1, with parts broken away.

Figure 3 is a detail side view of a modification, with parts broken away.

Figure 4 is a section on the line 4—4, Figure 3.

Figure 5 is a section on the line 5—5, Figure 3.

In the drawing, the numeral 1 designates the platen shaft, having bearings in the stationary framing 2, said shaft carrying a recessed handle knob 3, provided with an intumed inner sleeve 4, said sleeve having a threaded perforation engaged by a set screw 5 contacting said shaft to make said knob fast thereto.

Loosely mounted upon the platen shaft 1 is a circular plate 6, having a hub 7, provided with a detent wheel 8, engaged by a spring detent 9, pivoted on said framing.

The circular plate 6 has the outer lateral face thereof contacting the inner lateral face of the circular end plate 10 of said handle knob from which said sleeve 4 projects inwardly, said end plate having an endless series of twelve equally spaced perforations or recessed seats 11, and said plate 6 having an endless series of eleven equally spaced perforations or recessed seats 12, the two series of perforations being both concentric with and equidistant from the shaft 1 and the perforations being all of the same diameter. The extent of the intervals between the perforations of the two plates therefore differs in the two series. The end plate 10 of the handle knob 3 is hereinafter referred to as the primary plate and the circular plate 6 as the vernier plate.

Loosely mounted upon the platen shaft 1 is a secondary handle knob 13, the inner end portion of which extends within the recessed main handle knob 3 and terminates inwardly in a recessed portion or cup 14 the inner circumferential edge

of which is formed into a cam 15, an endless series of balls or plungers 16, equal in number to and engaging the perforations of said primary plate being, in cooperation with a spring thrust member to be described, in the rotation of said secondary handle knob and its cam in either direction, successively thrust into engagement with the offset margins of the related perforations of the vernier plate, the latter being held stationary by the detent means stated, to accomplish vernier adjustment of said primary plate and of said platen in either direction. In this vernier adjustment of the primary plate the perforations of the two plates become successively aligned and said balls successively engaged with the aligned perforations to thereby laterally distort said spring thrust member.

This spring thrust member comprises an annular coiled spring 17, engaging an annular recess formed by the annular beveled surface 18 and said vernier plate, said annular beveled surface 18 forming part of a collar 19 fast upon the hub 7 of the vernier plate. This spring thrust member 17 is caused to hug the vernier plate due to its engagement with said beveled surface 18 and acts to thrust said balls successively outwardly of the aligned perforations of the two plates in the vernier adjustment of the primary plate.

Since there are twelve of the balls 16 and only eleven perforations of the vernier plate, any movement rotatively of the secondary handle knob will impart one-twelfth of one-eleventh of its degree of movement to said main handle knob and the platen shaft; that is to say, for each complete rotation of said secondary handle knob the main handle knob and the platen shaft will be rotated one-eleventh of a rotation.

Primary adjustment of the platen shaft 1 is initiated directly by twirling the main handle knob 3 to any position determined by the detent wheel 8.

The secondary handle knob 13 and its cam are adapted to yield against the pressure of a coiled spring 20 located on the platen shaft within a recess of said knob, said spring abutting at its outer end against a thrust bearing 21, located on the outer end of said platen shaft and held against outward movement by a screw 22 engaging a threaded perforation of the end of said shaft, the secondary handle knob having slidable engagement with said thrust bearing and with the platen shaft, said spring holding said cam to its work and providing for smooth easy action in case of inaccuracies of manufacture.

While the invention as described accomplishes an adjustment ratio of one-eleventh, other ratios may be obtained; for instance by substituting a twenty-one hole and ball primary plate co-

operating with a twenty hole vernier plate, the ratio would be one-twentieth of a rotation of the platen shaft 1 for each complete rotation of the secondary handle knob.

In Figures 3, 4 and 5 of the drawing a modification is shown wherein the primary and vernier plates are provided with notches or recessed seats instead of perforations, the same reference characters being used differentiated by the exponent 1.

In this modification the margins of the notches of the vernier plate act to successively thrust the balls outwardly of the aligned notches.

I claim:

1. In means for obtaining vernier adjustment, a primary plate having a series of equally spaced recessed seats, a vernier plate having a series of equally spaced recessed seats, the extent of the intervals between the recessed seats of the two plates differing in the two series, a series of plungers equal in number to and engaging the recessed seats of the primary plate, means for holding said vernier plate against movement, and means for thrusting said plungers successively into engagement with the offset margins of the related recessed seats of the vernier plate to accomplish vernier adjustment of said primary plate.

2. In means for obtaining vernier adjustment, a primary plate having an endless series of equally spaced recessed seats, a vernier plate having an endless series of equally spaced recessed seats, the extent of the intervals between the recessed seats of the two plates differing in the two series, an endless series of plungers equal in number to and engaging the recessed seats of the primary plate, means for holding said vernier plate against movement, and means including a cam for thrusting said plungers successively into engagement with the offset margins of the recessed seats of the vernier plate to accomplish vernier adjustment of said primary plate.

3. In means for obtaining vernier adjustment, a primary plate having an endless series of equally recessed seats, a vernier plate having an endless series of equally spaced recessed seats, the extent of the intervals between the recessed seats of the two plates differing in the two series, an endless series of plungers equal in number to and engaging the recessed seats of the primary plate, means for holding said vernier plate against movement, means including a cam for thrusting said plungers successively into engagement with the offset margins of the related recessed seats of the vernier plate to accomplish vernier adjustment of the primary plate whereby the recessed seats of the two plates are successively aligned and the plungers successively engaged with the aligned recessed seats, and means for thrusting said plungers successively outwardly of said aligned recessed seats.

4. In means for obtaining vernier adjustment, a primary plate having an endless series of equally spaced recessed seats, a vernier plate

having an endless series of equally spaced recessed seats, the extent of the intervals between the recessed seats of the two plates differing in the two series, an endless series of plungers equal in number to and engaging the recessed seats of the primary plate, means for holding said vernier plate against movement, means including a cam for thrusting said plungers successively into engagement with the offset margins of the related recessed seats of the vernier plate to accomplish vernier adjustment of the primary plate whereby the recessed seats of the two plates are successively aligned and the plungers successively engaged with the aligned recessed seats, and means including a spring for thrusting said plungers successively outwardly of said aligned recessed seats.

5. In means for obtaining vernier adjustment, a primary plate having an endless series of equally spaced recessed seats, a vernier plate having an endless series of equally spaced recessed seats, the extent of the intervals between the recessed seats of the two plates differing in the two series, an endless series of plungers equal in number to and engaging the recessed seats of the primary plate, means for holding said vernier plate against movement, and means including a cam for thrusting said plungers successively into engagement with the offset margins of the related recessed seats of the vernier plate to accomplish vernier adjustment of the primary plate whereby the recessed seats of the two plates are successively aligned and the plungers successively engaged with the aligned recessed seats, the margins of the recessed seats of the vernier plate acting to successively thrust said plungers outwardly of said aligned recessed seats.

6. In means for obtaining vernier adjustment, a primary plate having a series of equally spaced recessed seats, a vernier plate having a series of equally spaced recessed seats, the extent of the intervals between the recessed seats of the two plates differing in the two series, a series of plungers equal in number to and engaging the recessed seats of the primary plate, means for holding said vernier plate against movement, and means including a member movable in either direction for thrusting said plungers successively into engagement with the offset margins of the related recessed seats of the vernier plate to accomplish vernier adjustment of the primary plate in either direction.

7. In means for obtaining vernier adjustment, a primary plate having an endless series of equally spaced recessed seats, a vernier plate having an endless series of equally spaced recessed seats, the extent of the intervals between the recessed seats of the two plates differing in the two series, an endless series of plungers equal in number to and engaging the recessed seats of the primary plate, means for holding the vernier plate against movement, and means including a cam movable in either direction for thrusting said plungers successively into engagement with the offset margins of the related recessed seats of the vernier plate to accomplish vernier adjustment of the primary plate in either direction.

LORING PICKERING CROSMAN.