Nov. 22, 1938. C. H. BRADT ET AL 2,137,263

TOGGLE STOP DEVICE

Filed March 29, 1937

Fig. 1.

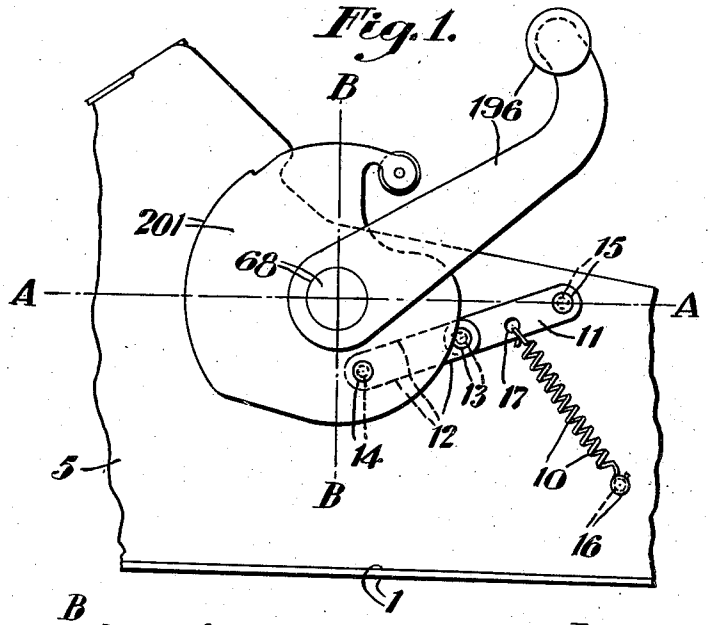


Fig. 2.

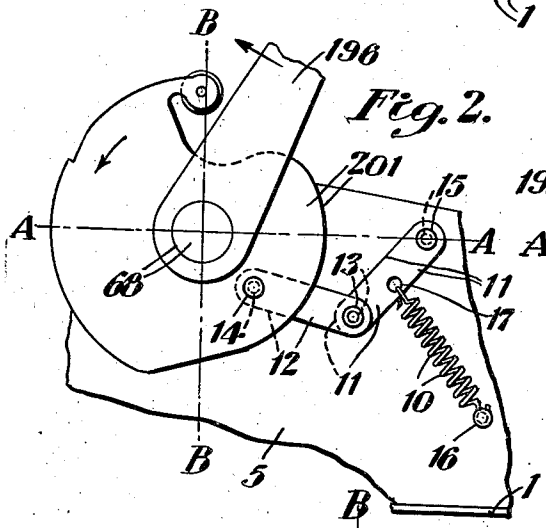


Fig. 3.

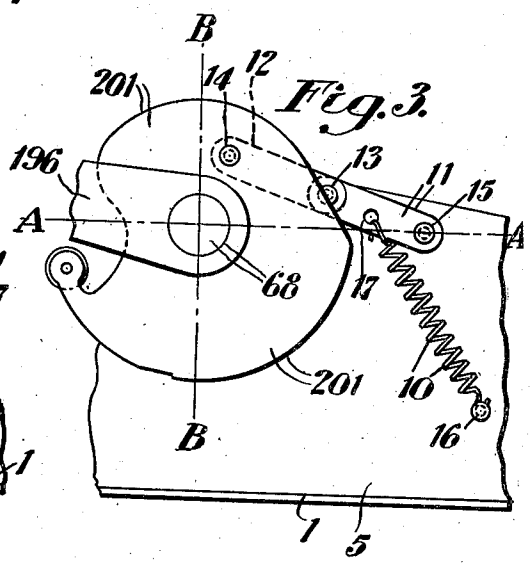
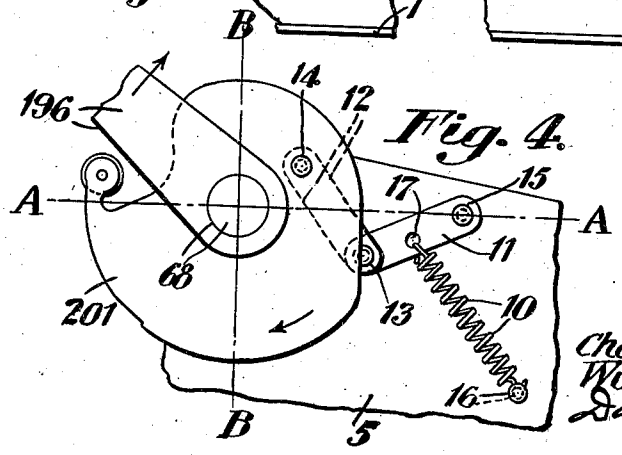


Fig. 4.



INVENTORS
Charles H. Bradt
William J. Higgins
ATTORNEYS

Patented Nov. 22, 1938 2,137,263

UNITED STATES PATENT OFFICE

2,137,263

TOGGLE STOP DEVICE

Charles H. Bradt and William J. Higgins, Groton, N. Y., assignors to L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y., a corporation of New York

Application March 29, 1937, Serial No. 133,567

7 Claims. (Cl. 74—526)

This invention relates to improvements in calculating machines.

The principal purposes of the invention are to provide improved, simple and efficient means for determining the limits of oscillating motion of the general operator in a calculating machine controlled through an oscillating general operator such as an oscillating main shaft or oscillating crank handle; to provide improved stop means for limiting motion of such a general operator with a minimum of shock and noise; and to provide a single silently acting means connected with such an operator to arrest motion thereof in both directions about its axis without any noise-producing impact.

Other purposes and advantages of the invention will appear from the following description of the preferred embodiment of the invention which is illustrated in the accompanying drawing, and it is a purpose of the invention to attain any such additional advantages as are inherent in the invention as embodied in the construction illustrated in said drawing.

The drawing illustrates the invention in the preferred form and as applied to the calculating machine shown and described in the patent to Barrett, No. 1,811,840, granted June 30, 1931. Only so much of the machine of said patent is shown in the drawing and will be described as is necessary for a clear understanding of the present invention and reference should be had to said patent for other details of said machine.

In the drawing:

Fig. 1 is a fragmentary side elevation of the machine with the main operating handle rocked rearward into its normal idle position, or arrested at the rearward limit of throw of the handle;

Fig. 2 is a similar view showing the handle started on its forward throw;

Fig. 3 is a similar view showing the handle rocked forward to, and arrested at, the limit of its forward throw; and

Fig. 4 is a similar view showing the handle started rearward from its position of Fig. 3 toward its normal idle position of Fig. 1.

The recording calculating machine shown and described in said patent has a horizontally disposed main operating shaft 68 journalled in suitable bearings on the stationary supporting main frame of the machine, which frame includes frame members 1 and 5. This main shaft or general operating shaft 68, protrudes from frame member 5 at the right hand side of the machine and, in the machine shown in said patent is manually oscillated in its bearings by means of a main operating crank-handle 196 which has a throw of 135 degrees and is fixedly held to the outer right hand end of shaft 68 for oscillation of the handle and shaft in unison. Fixed on shaft 68 of said machine to oscillate in unison with the shaft is a control cam 201.

To actuate said machine, the handle 196 is pulled forward from its normal idle position through an arc of 135 degrees to its forward limit of throw and is then reversely swung back to its idle position or rearward limit of throw. To limit the oscillation of the handle and shaft about the shaft axis there is provided, in the machine of said patent, a stop stud (designated 203 in said patent) fixed on frame member 5, which stud protrudes through an arcuate slot (designated 202 in said patent) formed in cam 201, and preferably also a stop pad (designated 204 in said patent) and held to said cam at one end of said slot 202 to engage said stud at the rearward limit of throw of the handle, said stud being engaged with the cam at the other end of said slot 202 at the forward limit of throw of the handle.

The stop means disclosed in said patent, and above briefly described, for determining the limits of oscillation of the general operator of the machine of said patent have been found to cause objectionable shock and noise.

While the improved stop means of the present invention in the preferred form thereof has been shown as applied to the machine of said patent it will be obvious that the invention may be applied to other calculating machines. The construction and arrangement of the stop means shown may also be varied.

In applying the preferred construction of the improved stop means to the machine of said patent, the stop means (designated as 202, 203 and 204 in said patent) for the general operator of the machine of said patent are eliminated, and there is substituted therefor the improved stop means now to be described.

This improved stop means comprises a light toggle-breaking spring 10, and a toggle which consists of two rigid toggle links 11 and 12, preferably formed of stiff sheet metal, the adjacent ends of which toggle links are pivotally held together by a suitable pivot 13. The two ends of the toggle are pivotally anchored respectively to cam 201 and member 5 of the stationary supporting main frame 1—5 of the machine by suitable pivots 14 and 15.

The axes of the pivots 13, 14 and 15 extend

horizontally transversely of the machine parallel to the axis of shaft 68. The axes of the shaft 68 and the pivot 15 both lie in the same horizontal plane designated in each view of the drawing by the dot and dash line A—A. The pivotal anchorage 14 of link 12 to cam 201 is so spaced radialy outward from the common axis of the said cam and the shaft 68 to which the cam is fixedly held that the toggle will fully straighten out to limit oscillation of the shaft 68, cam 201 and handle 195 about the shaft axis to the same 135 degree arc as in the machine of the Barrett patent above referred to. The toggle in the construction shown, will fully straighten to arrest rearward throw of the handle in its normal idle position with the straightened toggle extending forwardly and downwardly from its pivotal anchorage 15, as shown in Fig. 1, and said toggle will fully straighten to arrest forward throw of the handle (when the latter is rocked forward 135 degrees from its idle position) with the straightened toggle extending forwardly and upwardly from its fixed pivotal anchorage 15 on the frame. The anchorage 14 of the toggle to cam 201 is located the same distance above plane A—A at the forward limit of throw of the handle as it is below said plane at the rearward limit of throw of the handle, the two positions of the pivot anchorage 14 at the two limits of handle throw being located in a plane which is parallel to, and in rear of, a vertical plane through the axis of shaft 68, which vertical plane is designated in each view of the drawing by the dot and dash line B—B.

It will be seen from the drawing that, by this arrangement, the toggle is located to the rear of plane B—B in all positions of the handle and that the toggle can be folded, broken or buckled in the same direction (downwardly in the construction shown) during both the forward and reverse swings of the handle. By connecting a spring of light or weak force to one or the other of the links of the toggle, breaking or folding of the toggle in the same direction is insured upon exertion of effort on the handle to swing the latter either forward from its rearward limit of movement or backward from its forward limit of movement.

The light spring 10, shown for insuring such starting of the folding or breaking movements of the toggle, is a coiled tension spring which extends in an up and down direction and is connected at its lower end at 16 to member 5 of the frame and at its upper end at 17 to link 11 of the toggle intermediate the pivots 13 and 15. The tension of spring 10 is such that said spring is incapable of rocking the handle, but is sufficient to initially break the toggle upon exertion of actuating force on the handle by a person using the machine.

The angle which the toggle makes to plane A—A when fully straightened, is the same at both limits of oscillation of the general operating shaft 68, as is shown in Figs. 1 and 3; but in Fig. 1 the toggle is inclined downwardly and forwardly relatively to plane A—A, while in Fig. 3 the toggle is inclined upwardly and forwardly relatively to said plane, from the fixed toggle anchorage on the frame.

The described construction is such that a forward pull on the handle from its Fig. 1 position will result in the handle swinging forward, and in the toggle first breaking or folding downward (as shown in Fig. 2) and thereafter finally straightening (as shown in Fig. 3) to arrest forward swing of the handle with very little noise and shock after the handle has swung forward through an arc of 135 degrees. Upon reverse swing of the handle from Fig. 3 position, the toggle will first fold downward (as shown in Fig. 4) and thereafter finally straighten (as shown in Fig. 1) to arrest the handle when the handle is restored to its normal idle position shown in Fig. 1.

It will be observed that the same means arrests the oscillation of the shaft and handle at both limits of motion, and that the arrest is effected at both limits by said means without noise and shock producing impact or collision between relatively movable parts.

What we claim is:

1. The combination of an element supported for oscillation thereof about a fixed axis, and a toggle having a stationary anchorage and also having an anchorage which oscillates with said element and connects the toggle with said element at a distance so spaced radially from the axis of oscillation of the element that movement of said element in each direction about its axis will be positively and quietly limited with little shock by straightening of the toggle.

2. The combination of an element supported for oscillation thereof about a fixed axis, and a toggle having a fixed anchorage and also anchored to said element eccentrically of the axis of said element to straighten upon movement of said element in both directions about its axis through an arc not exceeding 180 degrees.

3. The combination of an element supported for oscillation thereof about a fixed axis, and a toggle stop device for said element constantly biased to fold in one and the same direction and having a fixed anchorage and an anchorage to said element, which latter anchorage is so spaced radially from the axis of said element as to cause the toggle to straighten and arrest said element upon movement of said element about its axis in both directions.

4. The combination of an element supported for oscillation thereof about a fixed axis, a toggle anchored to said element eccentrically of the axis of the latter and having a fixed anchorage, the toggle anchorages being so located relatively to the axis of said element that the toggle will straighten upon movement of the element in both directions about its axis and arrest movement of said element when straightened, and spring means having a fixed anchorage and anchored to said toggle to constantly bias the toggle to fold or break in one and the same direction.

5. The combination of an element supported for oscillation thereof about a fixed axis, a toggle anchored to said element eccentrically of the axis of the latter and having a fixed anchorage, the toggle anchorage and the axis of said element being so arranged that movement of said element in both directions will be arrested by straightening of the toggle, and means constantly biasing the toggle to fold in one and the same direction and ineffective to move said element about its axis.

6. Actuating mechanism for machines, such as calculating machines, comprising, in combination, an actuating element supported for oscillation thereof about a fixed axis, a toggle having a stationary anchorage and also having an anchorage which oscillates in unison with said actuating element and connects the toggle with said element at such a distance radially from the axis of said element that movement of the actuating element in both directions about its axis will

be arrested by straightening of the toggle, and means constantly effective on the toggle to bias the latter to fold in a single direction, said biasing means and toggle being ineffective to oscillate the actuating member.

7. Actuating mechanism comprising an actuating shaft journalled for oscillation about a fixed axis, a handle fixed to said shaft to oscillate the shaft, a toggle having a fixed anchorage and also having an anchorage which oscillates with said shaft and is so spaced radially from the shaft axis that oscillation of the shaft will be restricted to an arc of less than 360 degrees by straightening of the toggle incident to movement of the shaft in each direction about its axis by the handle, and a light pull spring anchored to a fixed anchorage and the toggle to constantly bias the toggle to fold in one and the same direction after straightening of the toggle by movement of the shaft in either direction about the shaft axis, said spring being too light to oscillate the shaft and handle through pull of the spring on the toggle.

CHARLES H. BRADT.
WILLIAM J. HIGGINS.