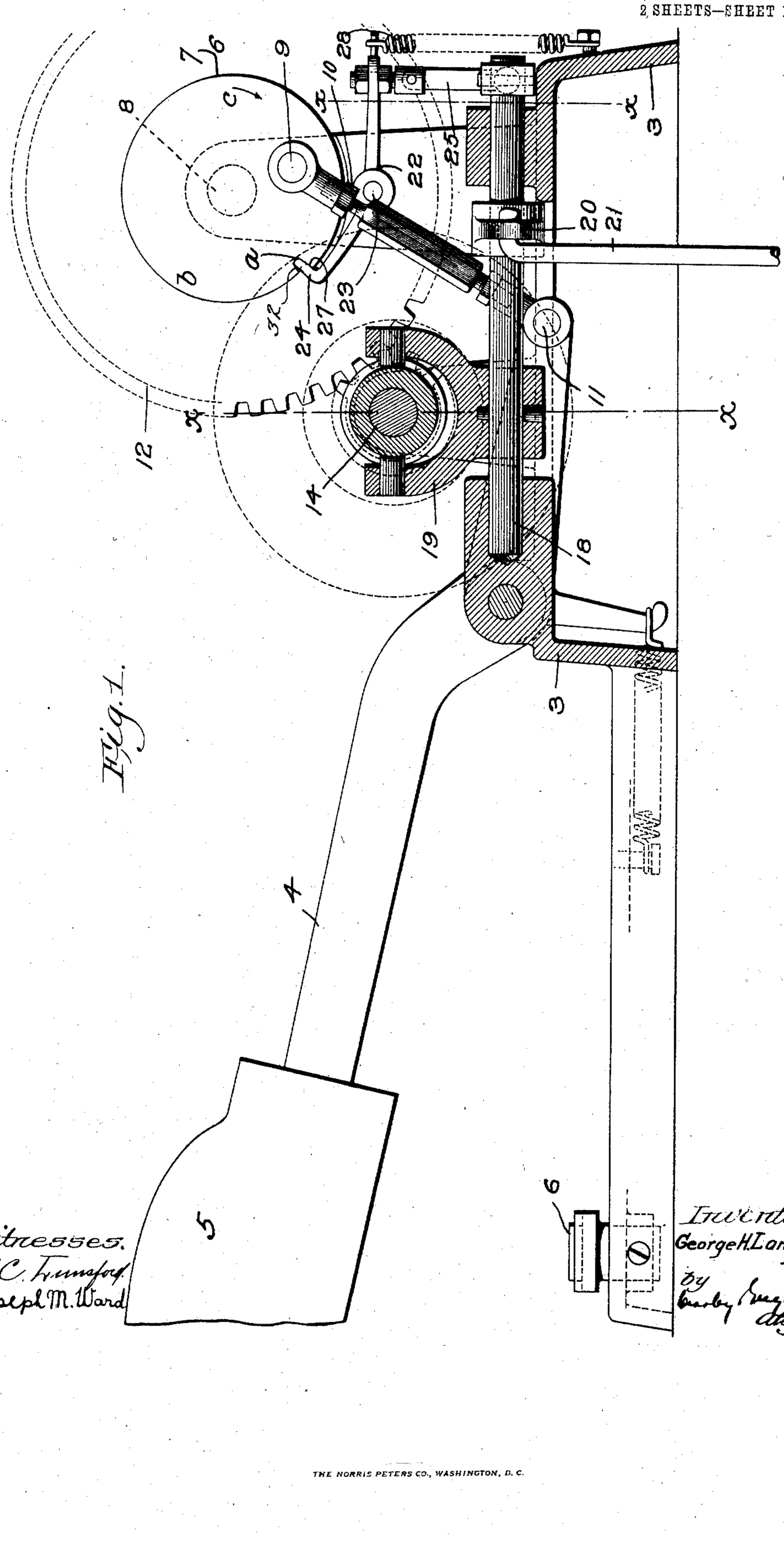
No. 864,849. PATENTED SEPT. 3, 1907.

G. H. LANG.

STOP MOTION.

APPLICATION FILED OCT. 26, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

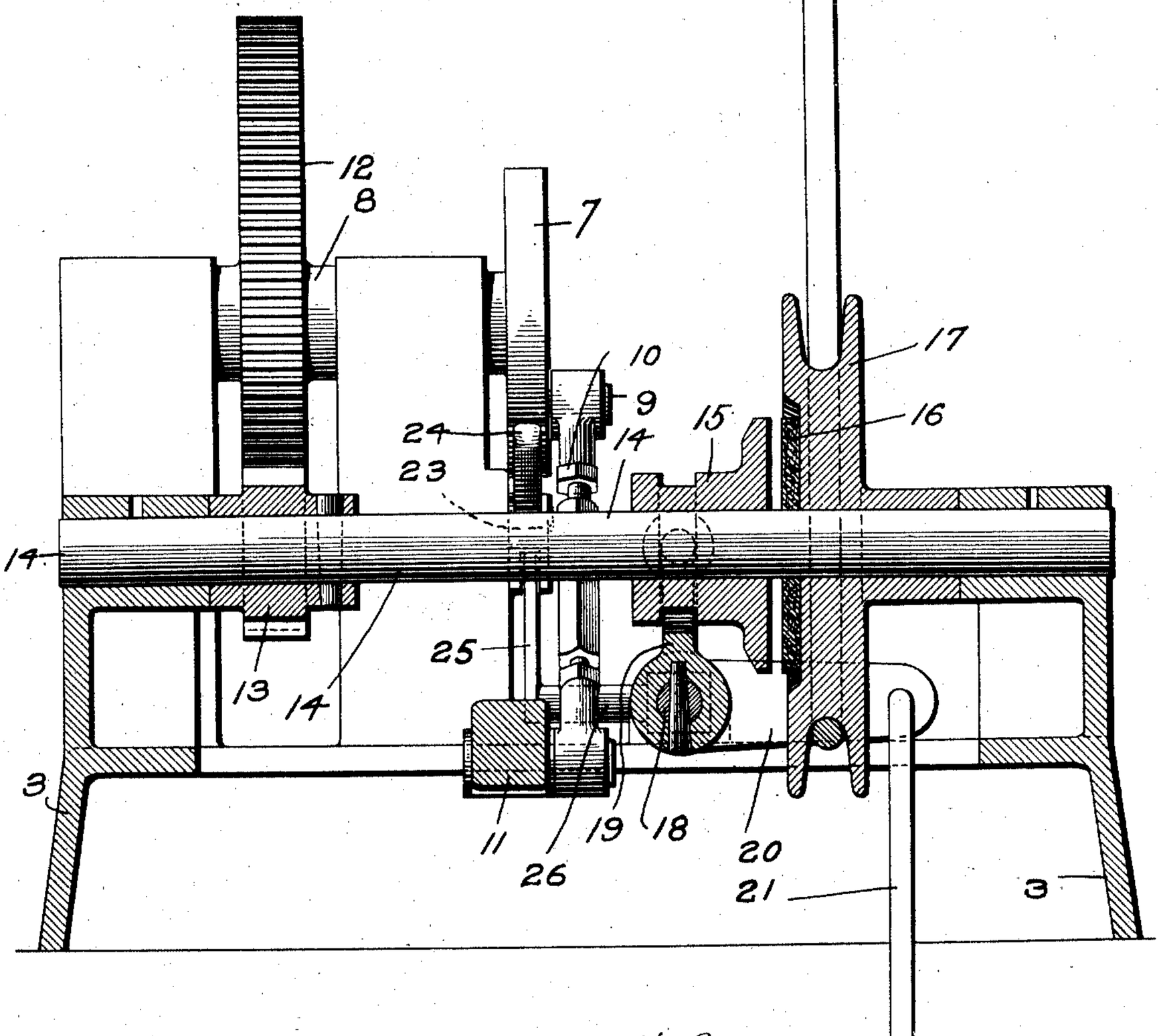
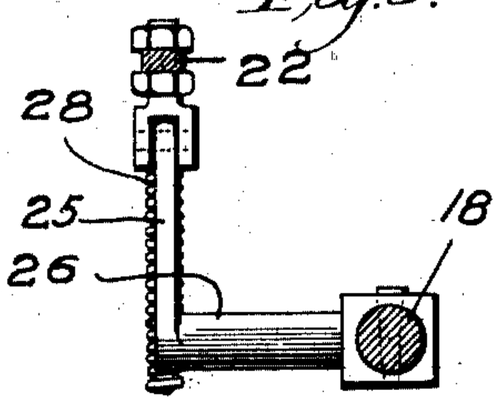


Fig. 3.



Witnesses.
W. C. Dunnaford.
Joseph M. Ward.

Inventor:
George H. Lang,
by Crosby Gregory Attys.

UNITED STATES PATENT OFFICE.

GEORGE H. LANG, OF BOSTON, MASSACHUSETTS.

STOP-MOTION.

No. 864,849. Specification of Letters Patent. Patented Sept. 3, 1907.

Application filed October 26, 1906. Serial No. 340,629.

To all whom it may concern:

Be it known that I, GEORGE H. LANG, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Stop-Motions, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

The object of the present invention is to provide a novel stop motion which can be used with a machine to stop the latter and bring it to rest at a predetermined point in the cycle of operations.

The invention is herein illustrated as used in connection with a numbering machine in which the numbering mechanism is carried by a vibrating arm, and in which the mechanism for vibrating said arm includes a friction clutch.

The stop motion is so arranged that at a suitable interval before the mechanism is to be brought to rest the clutch will be thrown out of engagement, the parts continuing in operation through momentum until the desired predetermined point has been reached when said stop motion acts to positively bring said mechanism to rest.

One embodiment of the invention will first be described and then the novel features thereof will be pointed out in the claims.

In the drawings, Figure 1 is a vertical section through a numbering machine having my improved stop motion applied thereto; Fig. 2 is a section on substantially the line *x*—*x*, Fig. 1; Fig. 3 is a detail hereinafter referred to.

The numbering machine in connection with which my invention is herein illustrated comprises a bed or base piece 3 on which is pivoted a vibrating arm 4, which arm carries at one end a numbering head designated generally by 5. This head carries the numbering mechanism of any suitable construction, but which is not herein shown as it forms no part of my present invention.

The material to be numbered is placed on a rest or pad 6, and the arm 4 vibrated to bring the numbering head against the material supported by the platen or rest 6. The arm 4 is given its vibration by means of an actuating member 7, herein shown as a crank disk mounted upon a suitable shaft 8 carried by the frame. This crank disk 7 has extending therefrom a crank pin 9 to which is connected one end of a link or pitman 10, the other end of said link being pivoted to the extended end of the vibrating arm 4, as at 11.

The shaft 8 may be driven in any suitable way, and is herein shown as having fast thereon a gear 12 which meshes with and is driven by a pinion 13 fast on the driving shaft 14.

Splined to the driving shaft 14 is one member 15 of a friction clutch, the other member 16 of which is carried by the driving pulley 17 that is loosely mounted on the shaft 14.

In the machine herein shown it is desirable to provide for stopping the movement of the actuating member 7 when the arm 4 is raised, as shown in Fig. 1, and the means I have herein shown for doing this is so constructed that when the friction clutch is thrown into engagement said means will hold the clutch in engagement until the crank disk 7 has made nearly a complete revolution, when said means will permit the clutch to be disengaged and will then bring the parts to rest at a predetermined point.

For actuating the clutch a rock shaft 18 is provided which has fast thereto a forked arm 19 that engages the clutch member 15 and has also extending therefrom another arm 20 to which is connected a link 21 leading to a suitable treadle or other manually manipulated device. When the treadle is depressed to draw downward on the link 21 the rock shaft 18 will be turned to throw the clutch members into engagement thereby to set the mechanism in operation. For maintaining the clutch in operation the desired length of time and then for discontinuing it at the proper point I have provided a stop member 22, shown as a lever pivoted to the frame, as at 23, and having at one end a nose 24 to bear against the periphery of the crank disk 7, and having its other end connected by a link or thrust member 25 to an arm 26 extending from the rock shaft 18.

The periphery of the disk 7 is concentric or circular for the greater portion of its length but for a short distance, as for instance between the points *a* and *b* it is eccentric, and at the point *a* it has a shoulder 27. The stop member 20 is acted upon by a suitable spring 28 which tends to keep the nose 24 thereof in engagement with the disk 7.

In the operation of the machine the operator starts the mechanism by depressing a treadle, as above described, thereby throwing the clutch members into engagement. The rocking of the rock-shaft 18 necessary to cause the clutch members to be thrown into engagement acts through the arm 26 and strut or thrust member 25 to turn the stop member 22 about its pivot sufficiently to disengage the nose 24 from the shoulder 27. The actuating member 7 is thus unlocked simultaneously with the throwing of the clutch into engagement. As soon as the clutch is in engagement the disk 7 is turned in the direction of the arrow *c*, Fig. 1, and of course the machine will continue in operation as long as the treadle is held in its depressed position. Whenever it is desired to stop the machine however the treadle is released, and when this is done the spring 28 throws the nose 24 into engagement with the periphery of the disk 7. The size of the concentric portion of said disk is such that so long as the nose 24 is in engagement therewith the clutch is held in engagement

so that the concentric portion of the disk acts as a means for maintaining the clutch in engagement. When the crank disk 7 has reached such a point in its rotation that the eccentric portion of the periphery is engaged by the nose 24 the rock shaft 18 is permitted to turn sufficiently to permit the clutch to be disengaged. Owing to the momentum of the parts however the crank disk and the vibrating arm 4 will continue their movement, although with a progressively decreased speed, until the nose 24 brings up against the shoulder 27 when the movement will be arrested.

The length of the eccentric portion of the periphery of the disk is such that the friction of the parts will very nearly bring them to rest before they are positively stopped by the nose 24, and thus the positive stopping is effected without any material jar or vibration. I have also provided means for locking the crank disk 6 from backward rotation after it has been brought to rest, and in the present embodiment of my invention this is accomplished by providing said disk with a notch 32 adjacent the shoulder 27 into which the nose 24 is thrown by the action of the spring 28 when the disk has been brought to rest. This notch locks the disk from backward rotation and prevents any rebound.

The form of the stop member herein shown is capable of use with various machines having a vibrating arm, and I wish it understood that the invention is not limited in its application to a numbering machine such as herein shown. Furthermore, I would state that while the embodiment of the invention herein shown is the preferred embodiment, and has, therefore, been selected to illustrate the invention yet said invention is not limited to the construction illustrated.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a stop motion, a vibrating arm, a crank disk to actuate said arm, a clutch for driving the crank disk, means tending normally to disengage said clutch, and means acted upon by said disk to maintain the clutch in engagement.

2. In a stop motion, a vibrating arm, a crank disk to actuate said arm, a clutch for driving the crank disk, means having continuous engagement with the disk to maintain the clutch in engagement, and means for disengaging the clutch.

3. In a device of the class described, a vibrating arm, a crank-disk to actuate it, a clutch for driving the crank disk, and means acted on continuously by the disk to maintain the clutch in engagement.

4. In a stop motion, a vibrating arm, a crank disk connected thereto, a clutch independent of said crank disk for driving the latter and means to maintain the clutch in engagement during a predetermined length of time.

5. In a stop motion, a vibrating arm, a crank disk connected thereto, a clutch for driving the crank disk, a spring to disengage the clutch, and disk-controlled means to maintain the clutch in engagement during a predetermined length of time.

6. In a device of the class described, a crank disk, a clutch for operating said disk, a rock-shaft for actuating the clutch, means acted on by the disk to maintain the clutch in engagement, and means to disengage the clutch when released by the disk.

7. In a stop motion, an actuating member having a cam surface, a clutch for actuating said member, a rock-shaft for operating the clutch, a member connected to the rock-shaft and bearing against the cam surface and acting to maintain the clutch in engagement, and automatically-operative means to disengage the clutch when such action is permitted by the cam surface.

8. In a device of the class described, a rotary member having a cam surface provided with a high portion and a low portion, a clutch for driving said member, a rock-shaft for operating the clutch, a member connected to the rock-shaft and bearing against said cam surface, said member operating to maintain the clutch in engagement when it bears against the high portion of the cam, and automatically-operative means to disengage the clutch when said member bears against the low portion of the cam surface.

9. In a device of the class described, a vibrating arm, a crank disk to actuate it, said disk having a stop shoulder, a clutch for driving the crank disk, and disk-controlled means to maintain the clutch in operation, and means to disengage the clutch, said disk-controlled means coacting with the stop shoulder to stop the crank disk after the clutch has been disengaged.

10. In a stop motion, a vibrating arm, a crank disk to actuate said arm, said crank disk having a portion of its periphery concentric and a portion eccentric and also having a stop shoulder, a clutch for driving said disk, clutch actuating mechanism, and a stop member connected to the clutch-actuating mechanism and provided with a nose yieldingly held against the periphery of the disk.

11. In a device of the class described, a rotary actuating disk member having a portion of its periphery concentric and the remainder eccentric and also having a stop shoulder, a clutch for driving said member, a rock shaft for operating the clutch, and a spring pressed stop member connected to the rock shaft and engaging the periphery of the disk, the latter having a locking notch adjacent the shoulder with which the stop member engages when the disk is brought to rest.

12. In a stop mechanism, a vibrating arm, a crank disk to actuate said arm, a clutch for driving the crank disk, and means controlled by the disk to govern the operation of the clutch and to lock said disk from backward rotation after the disk has been brought to rest.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGE H. LANG.

Witnesses:
LOUIS C. SMITH,
MARGARET A. DUNN.