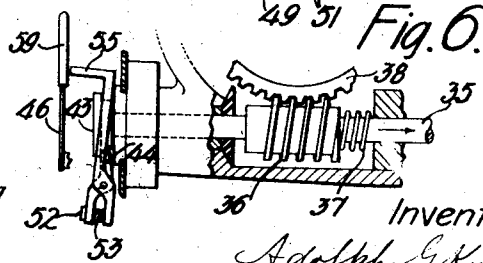
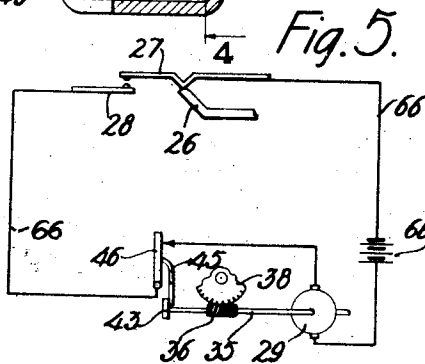
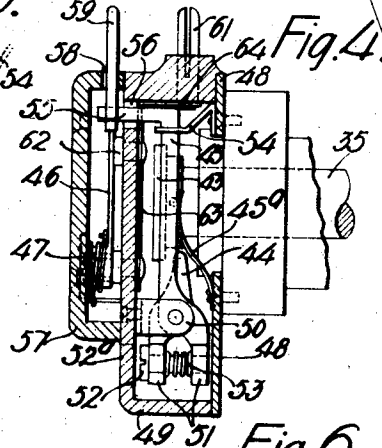
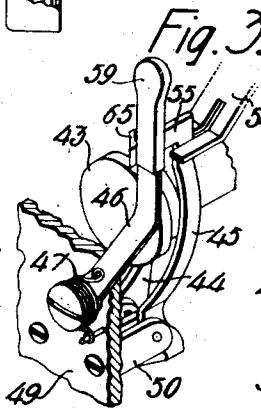
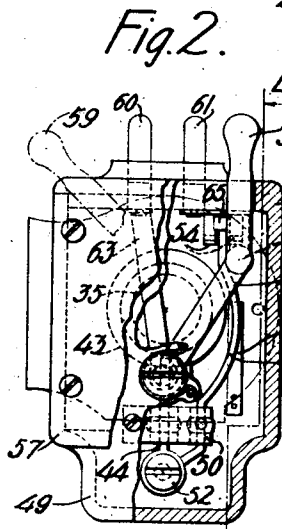
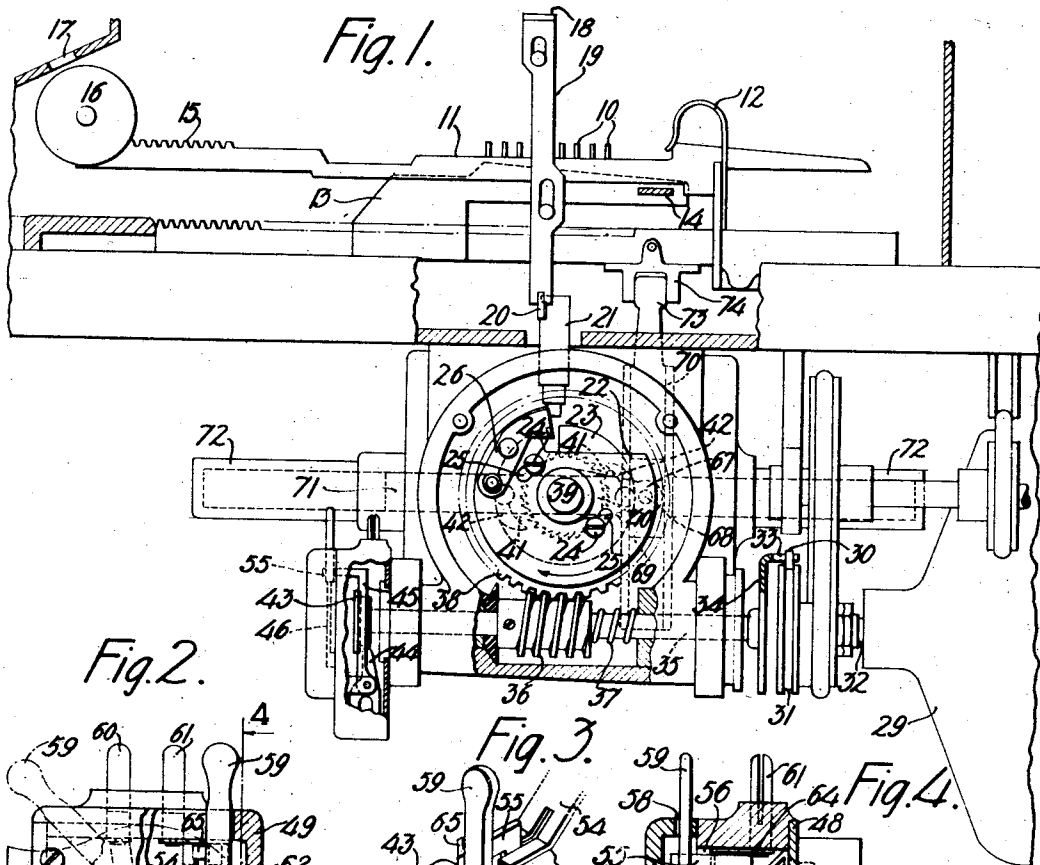


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1,440,610.

A. G. KUPETZ.  
COMPUTING MACHINE.  
FILED OCT. 16, 1920.



Inventor:  
*Adolph G. Kupetz*  
by *B. B. Stickney*  
Attorney

## UNITED STATES PATENT OFFICE.

ADOLPH G. KUPETZ, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO UNDERWOOD COMPUTING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## COMPUTING MACHINE.

Application filed October 16, 1920. Serial No. 417,389.

*To all whom it may concern:*

Be it known that I, ADOLPH G. KUPETZ, a citizen of the United States, residing in New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Computing Machines, of which the following is a specification.

This invention relates to computing mechanism, and more particularly to cut-out means for the motor to prevent damage thereto in case the computing mechanism becomes obstructed. The invention is herein disclosed as applied to a combined type-writing and computing machine of the Underwood-Hanson type.

The main object of the invention is to provide a simple and effective cut-out means for the motor, so that in case the computing mechanism gets stuck, burning out of the motor will be avoided.

In carrying out the invention, the reciprocation of the general operator may be effected by means including a worm-gear actuated by a worm, which, while normally held against movement longitudinally of its axis, may be so moved in case the general operator gets stuck before returning to its normal position, and in such case will actuate suitable mechanism to break the motor-circuit.

Other features and advantages will hereinafter appear.

In the accompanying drawings,  
 35 Figure 1 is a sectional side view of portions of a motor-actuated Underwood-Hanson machine with my invention applied thereto, the parts being shown in their normal positions.

40 Figure 2 is a view, looking from the left of Figure 1, of the novel structure, portions being broken away to show the underlying structure.

Figure 3 is a fragmentary perspective view of certain parts shown in Figure 2.

Figure 4 is a view of a section taken along the line 4-4 of Figure 2, looking in the direction of the arrows.

Figure 5 is a diagram of the electrical connections through which the motor is controlled.

55 Figure 6 is a view in which certain of the parts shown in Figure 1 are shown in the positions assumed when the switch-lever is released to break the motor-circuit.

In computing mechanism of the Underwood-Hanson type, digits of various denominations may be indexed by depressing the proper pin 10 of each of the pin-bars or members 11 of the proper denominations. 60 The pin-bars or denominational members 11 are normally held in their rearward positions by means of springs 12, and the pin-bars on which digits have been indexed may be actuated by a general operator 13 when given its forward movement, a bar 14 of the general operator engaging the depressed pins and driving the denominational members 11 in accordance with the pins depressed. 70

Each of the members 11 is provided with a rack 15, which forms part of a one-way driving connection with a corresponding dial wheel 16, the reading of the dial wheels at any time being taken through a sight-opening 17. 75

The mechanism by which the indexing is effected may be substantially the same as that disclosed in the patent to Frederick A. Hart, No. 1,287,301, dated December 10, 80 1918.

When it is desired to actuate the general operator, the person operating the machine will press down an offset portion 18 of a vertically slidable bar 19, the lower forked 85 end of which embraces the right-hand end of a lever 20, which is connected at the other side of its pivot with a pin 21, so that depression of the bar 19 will lift the pin 21 and cause operation of the motor-driving 90 means for the general operator. Upon lifting of the pin 21, a disk 22 will be moved in clockwise direction with reference to disk 23, by means of springs (not shown), the extent of such movement being determined 95 by screws 24 passing through slots 25 in disk 22 and screwed into disk 23. In such movement of the disk 22, a finger 26 thereon will be moved sufficiently to permit a spring contact 27 (Figure 5) to engage a fixed contact 100 28, thereby completing a circuit through the motor 29 and starting the same. Upon such movement of the motor, a lug 30 on a disk 31 carried by the motor-shaft 32 and extending into a slot in a projection 33 on a 105 member 34 carried by shaft 35 will actuate the latter and a worm 36 fixed thereon.

The worm 36 and the shaft 35, on which it is mounted, are held in their normal positions by a spring 37, as shown in Figure 1, 110

the connection between the motor and shaft 35 being such that the latter may be shifted to the right in Figure 1 without affecting the driving relation of the motor therewith.

5 The direction of rotation of the worm 36 is such as to drive in clockwise direction a worm-gear 38 mounted on shaft 39, the worm-gear 38 and a ratchet-wheel 40 fixed thereto being loosely mounted on said shaft 39. The slight relative movement of disk 22 with reference to disk 23 also causes pins 41 projecting rearwardly from disk 22 to release pawls 42 pivoted on 23, permitting said pawls to engage ratchet-wheel 40 and thereby connect the worm-gear with shaft 39, since disk 23 is fixed on the latter. After starting the motor 29 by depressing the slide 19, the latter may be released and the pin 21 permitted to return to its original position. As the worm-gear approaches the end of a complete rotation, finger 26 will cam spring contact 27 away from fixed contact 28 and break the motor-circuit. At substantially the same time, disk 22 will be stopped by pin 21 and disk 22 will be shifted to its normal position relative to disk 23, thereby causing pins 41 to withdraw pawls 42 from ratchet-wheel 40 and break the connection between worm-gear 38 and shaft 39. The mechanism just described is, in general, the same as that disclosed in the patent to Alfred J. Wood, No. 1,299,646, dated April 8, 1919, the only substantial difference residing in the provision of means whereby, in applicant's device, the worm 36 and shaft 35 may be shifted to the right, as shown in Figure 1.

The spring 37 is of sufficient strength so that in the ordinary operation of the computing mechanism, the worm 36 will be held in its normal position in engagement with the fixed bearing to the left thereof, as shown in Figure 1, but in case of stoppage of the general operator or the worm-gear 38, the worm 36 and shaft 35 will be moved to the right against the resistance of the spring 37, thereby causing a disk 43 on shaft 35 to engage and actuate a finger 44 and shift a latch-lever 45 connected therewith, so as to release a switch-lever 46 and permit it to be moved by a combined compression and torsion spring 47 to a position such as to break the motor-circuit. The switch-lever 46 may be of any suitable conducting material.

55 The circuit-breaking means just described is mounted on a plate 48 secured by suitable means such as screws to a fixed part of the machine. Suitably supported on plate 48 is a housing 49, and finger 44 and lever 45 are pivotally supported in lugs 50 projecting to the rear from the forward wall of housing 49 and attached thereto in any suitable manner. The lugs 50 for both finger 44 and lever 45 may be formed on a single plate secured to 65 the forward wall of housing 49.

In order to adjust the finger 44 and lever 45 relatively to each other, they may be extended downwardly below their pivots and furnished with disks 51 in alignment from front to rear, as shown in Figure 2, and a flat-headed screw 52 passed through an opening in the disk 51 of finger 44 and screwed into the disk 51 of latch-lever 45, a compression spring 53 urging said disks 51 apart, so that the distance between said disks may be varied by means of said screw 52. A suitable opening 52<sup>a</sup> is provided in the front wall of housing 49 to permit access to the head of screw 52.

As will be seen by inspection of the drawings, lever 45 is curved so as not to interfere with the movement of disk 43, and is guided near its upper end in a slotted bracket 54 secured to the plate 48, the bracket 54 furnishing a proper support to maintain in proper position the latch 55 projecting through an opening 56 in the front wall of the housing 49. Also, the switch-lever 46 is mounted on the front wall of housing 49 and is enclosed by an outer housing 57, through a slot 58 in which the handle 59 at the end of said switch-lever 46 projects. Preferably the handle 59 is of suitable non-conducting material such as fibre. The connections between the switch in the housings 49 and 57 and the motor-circuit are made through terminals 60 and 61 carried by the housing 49 and connected with the pivot of the switch-lever 46 and with terminal 62 on the front wall of housing 49 by means of conductors 63 and 64, respectively.

It will be evident that, after switch-lever 46 has been released and swung to its ineffective position and upon restoration of the machine to normal condition, disk 43 would be moved to the left in Figure 1 and the latch 55 restored to its normal position by suitable means, such as a leaf-spring 45<sup>a</sup> acting on latch-lever 45. In order then that the switch-lever 46 may be restored to its normal position by means of its handle 59, provision is made of an inclined portion 65 on latch 55, which will enable the switch-lever 46, when brought into engagement therewith, to force back the latch sufficiently to enable the switch-lever to be carried therepast and again latched thereby.

Obviously, the current for the motor-circuit 66 may be drawn from any suitable source, but, for convenience, the source is indicated as a battery 66<sup>a</sup> in the diagram in Figure 5.

The means for actuating the general operator 13 from the shaft 39 comprises a crank-arm 67, having thereon a pin 68 extending into a block 69 slidable in a vertical groove in a member 70 carried by a horizontal shaft 71 supported in fixed bearings 72. Rotation of shaft 39 will obviously effect reciprocation of member 70 in a horizontal 130

path and this motion will be transmitted to the general operator 13 by means of an extension 73 of member 70 projecting into a yoke 74 secured to the general operator.

5 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:

10 1. In combination, a motor, a worm driven thereby, a worm gear engaged by said worm, a shaft on which said worm is mounted, spring means normally holding the worm shaft against the thrust resulting from driv-  
15 ing the worm gear, but adapted to yield in case of excessive resistance by the worm gear, a contact device including a member movable to and from its circuit-closing position, means urging said member away from such  
20 position, a pivoted latch-lever having a portion to engage said member to hold the same in circuit-closing position, a second lever

pivoted coaxially with the first, means for connecting said levers, whereby the position of one relative to the other may be adjusted, 25 and a disk on the worm shaft positioned so that upon longitudinal movement of the latter, due to excessive resistance of the worm gear, the disk will engage said second lever and thereby shift the other so as to release 30 the movable contact member.

2. In combination, computing mechanism including means in which digits may be indexed, a motor, motor-actuated means to ac-  
35 tuate the computing mechanism in accordance with the digits indexed, and means whereby, upon stoppage of the computing mechanism before completing its action, the motor circuit will be broken and the motor thereby rendered ineffective.

ADOLPH G. KUPETZ.

Witnesses:

CATHERINE A. NEWELL,  
JENNIE P. THORNE.