

Feb. 28, 1939.

A. KÅLL

2,148,861

IMPRESSION MECHANISM

Filed Nov. 27, 1935

2 Sheets-Sheet 1

Fig. 1

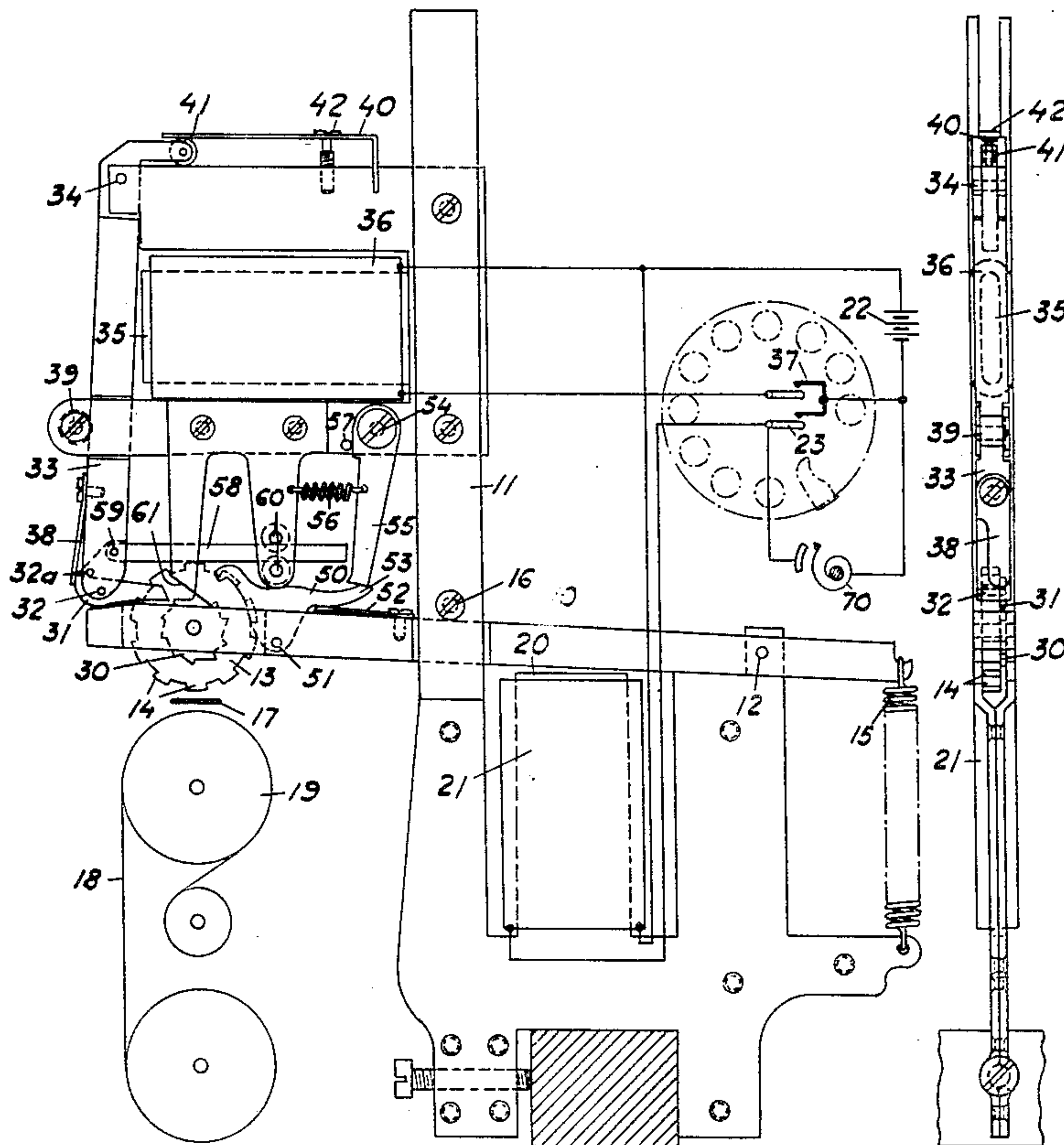


Fig. 2

ALFRED KALL
INVENTOR

PER *Josef Oppenheimer*

ATTORNEY

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A. KALL

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Fig. 3

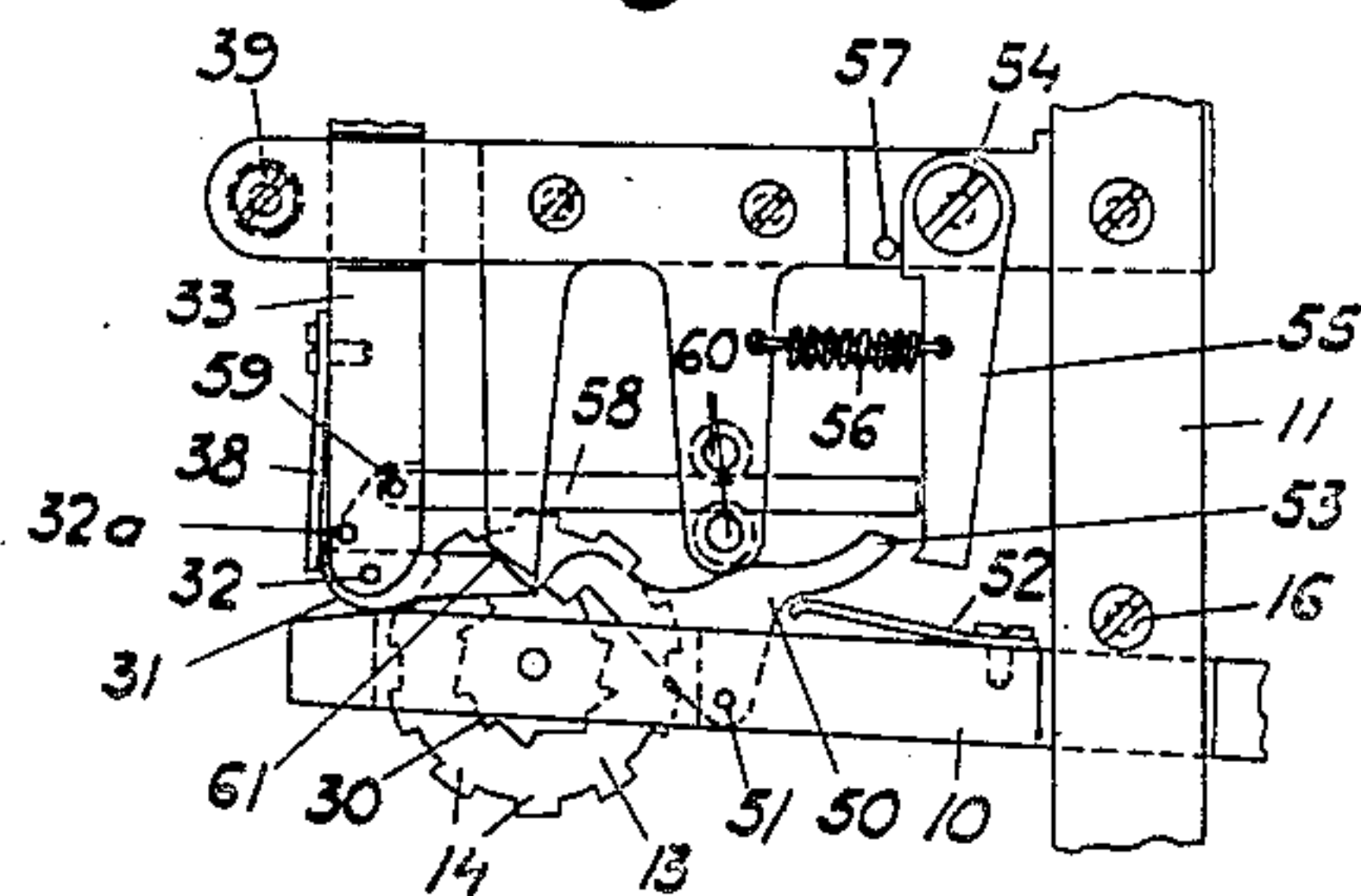


Fig. 4

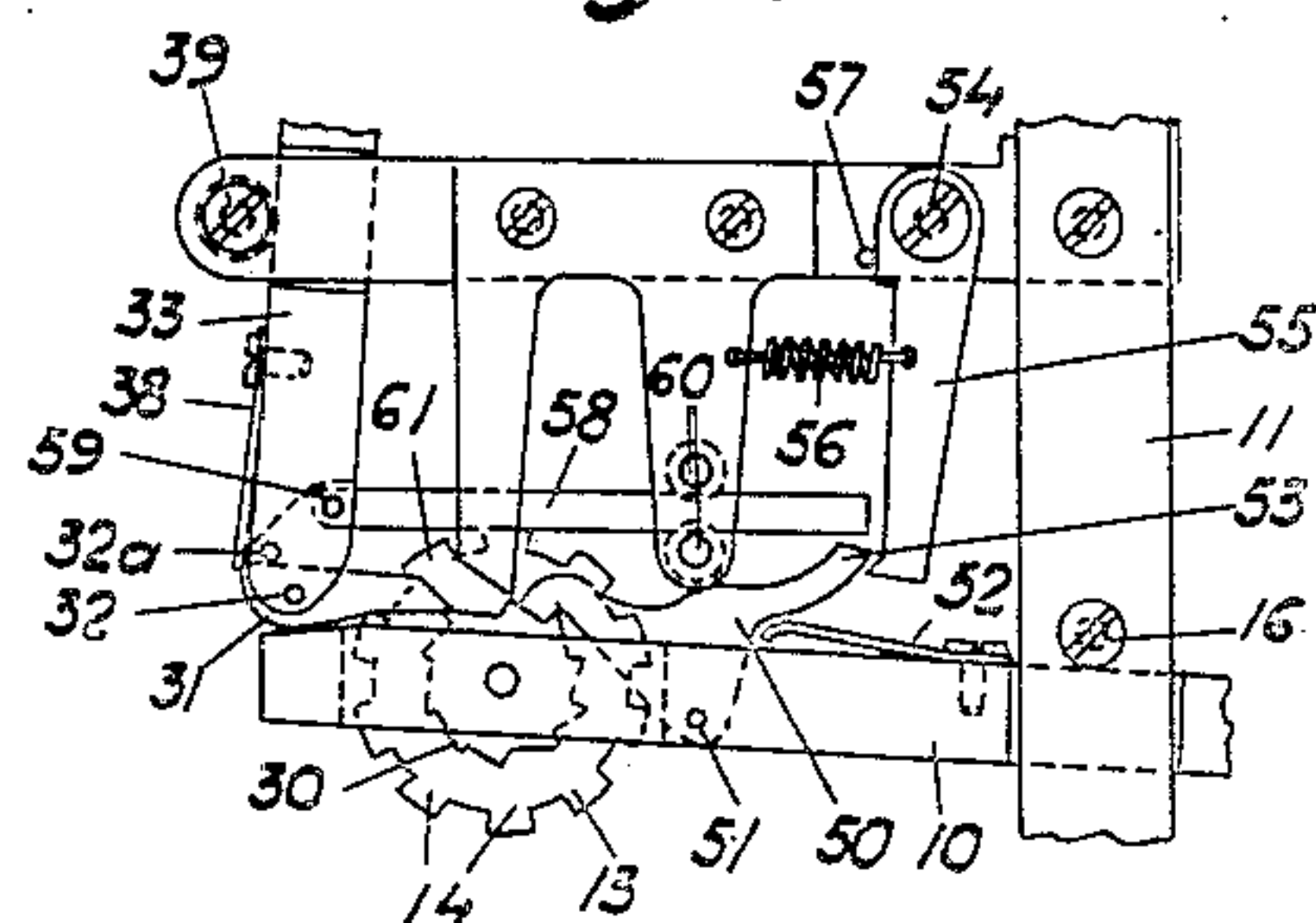
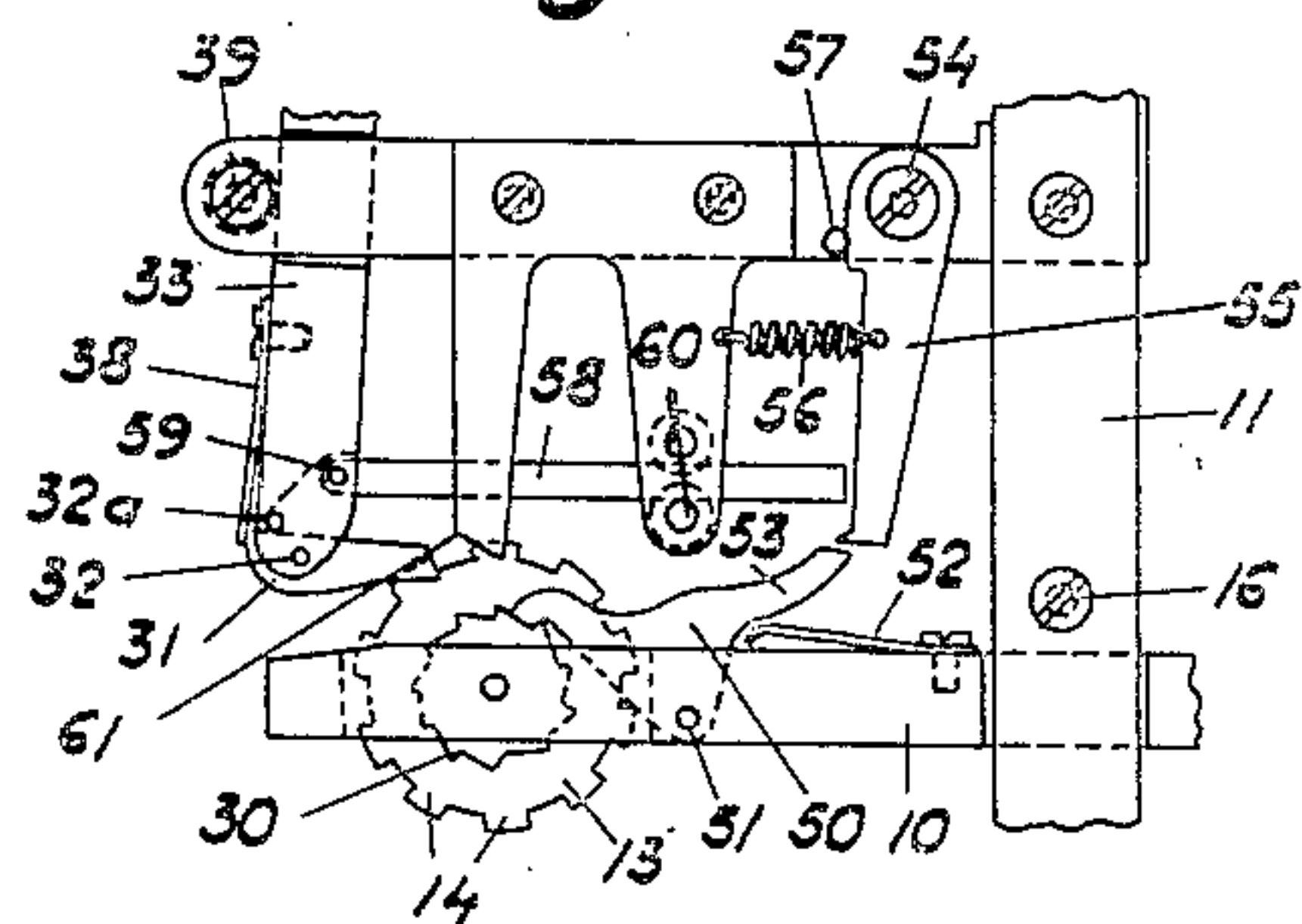


Fig. 5



ALFRED KALL
INVENTOR

PER *Josef Oppenheimer*
ATTORNEY

UNITED STATES PATENT OFFICE

2,148,861

IMPRESSION MECHANISM

Alfred Käll, Stockholm, Sweden, assignor to
Telefonaktiebolaget L. M. Ericsson, Stockholm,
Sweden, a company of Sweden

Application November 27, 1935, Serial No. 51,824
In Sweden November 28, 1934

4 Claims. (Cl. 234—5.8)

The present invention relates to impression mechanisms of the kind in which characters or other markings are recorded on a record strip through impacts against the strip by an impression hammer provided with a corresponding character type. The invention has for its object to provide an impression mechanism of this kind by means of which different digits, letters or other markings can be impressed on the strip in accordance with a selection made at a distant point. The invention is substantially characterized therein that the types carried by the movable impression hammer are arranged to be set under control of electric impulses through the intermedium of one or more stationary electromagnets, the types being preferably arranged on a common member, for example a wheel, an endless ribbon or a rod which is movably supported by the hammer.

The invention will now be explained in detail with reference to the accompanying drawings, in which—

Figure 1 is a side view of an embodiment of the invention with the movable parts in their starting positions,

Figure 2 is a front view of the embodiment shown in Figure 1, and

Figures 3 to 5 are part views on a larger scale showing the movable parts in three other positions.

Referring to the drawings, 10 designates the impression hammer which near one of its ends is supported in the frame 11 on a pivot 12 and carries at its other end a rotatably supported wheel 13. The latter is provided on its circumference with a number of different types 14, for instance representing the digits 0-9. A spring 15 one end of which is secured in the frame 11 and the other end of which is fastened to that end of the impression hammer which is nearest to the pivot 12, normally holds the impression hammer against a stop pin 16, whereby the type wheel 13 is held away from the coloured ribbon 17 and the record strip 18. The latter is moved in a suitable manner over a roller 19 serving as an anvil for the impression hammer 10. By means of an electromagnet, the core 20 of which is rigidly secured to or made integral with the frame 11, and the winding 21 of which is connected to a current source 22 through two parallel connected impulse contacts 23 and 70 positioned in a control station, the impression hammer can be attracted to strike against the roller 19, the type 14 which for the moment is in operative position then making a corresponding

impression on the record strip 18 through the intermedium of the coloured ribbon 17.

The impulse contact 70 is arranged to be actuated by one of the machines to be supervised (not shown) at regular intervals of speed of rotation or other performance of the machine. The impulse contact 23 is actuated automatically on actuation of a dial 71 containing an impulse contact to be referred to below. Said dial can be positioned for instance near an associated machine in a locked-up box to which a controller may have the key.

The type wheel 13 rotatably supported by the impression hammer 10 is provided with a pin (not shown) which normally bears against a stop on the hammer 10 under the action of a tensioned clock spring (not shown) which endeavours to turn the wheel counter-clockwise. It is assumed that in said position of the type wheel the short transverse stroke is in operative position in relation to the record strip 18. Rigidly connected with the type wheel 13 is a ratchet wheel 30 which co-operates with a feed pawl 31 when the impression hammer is in its upper limit position as shown in Figures 1, 3 and 4. The feed pawl 31 is pivoted on a pin 32 at the free end of an armature 33 which in turn is pivotally supported in the frame 11 on a pin 34 and co-operates with an electromagnet, the core 35 of which is secured to the frame 11 and the winding 36 of which is connected to the current source 22 by way of an impulse contact 37 in the control station. The impulse contact 37 is coupled mechanically in such a manner with the impulse contact 23 for controlling the impression movement that after a series of impulses corresponding to the dialled number has been transmitted by means of the impulse contact 37 another impulse is sent by means of the impulse contact 23. The feed pawl 31 is normally kept in the position shown in Figures 1, 4 and 5 in which its left end bears against a stop pin 32a on the armature 33 under the influence of a flat spring 38 secured to the armature. The armature 33 is normally held against a pin 39 in the frame by a spring 40 one end of which presses against a roller 41 at one end of the armature and the other end of which is supported on a portion of the frame 11 and embraces said portion in the manner of a fork. A screw 42 passing through the flat spring 40 intermediate its ends and secured in the frame 11 maintains the spring tensioned. By turning the screw the tension of the spring can be regulated as desired.

The ratchet wheel 30 cooperates not only with

the feed pawl 41 but also with a detent 50 which is pivotally supported on a pin 51 projecting from the impression hammer 10 and which normally engages the ratchet wheel under the action of a flat spring 52 secured to the hammer, as shown in Figures 3 to 5. When the detent 50 occupies the position shown in said figures a striking arm 55 pivotally supported in the frame 11 at 54 bears against an extension 53 of the detent 50 under the action of a tensioned draw spring 56. When the detent 50 is in its starting position out of engagement with the ratchet wheel 30 (Figure 1), the striking arm 55 is pressed by the spring 56 against a stop pin 57. The striking arm 55 can be brought out of said latter position by a rod 58, which at its left end is pivotally connected with the armature 33 by means of a pin 59 and near its right end is guided between two pins 60 secured in the frame and provided with heads extending over the rod.

It will be immediately understood that the angle at the centre between two adjacent teeth on the ratchet wheel 30 is equal to the angle at the centre between two types on the type wheel 13, so that when the ratchet wheel is moved one step another type 14 on the type wheel is moved to operative position. In order to prevent the ratchet wheel from being moved too far an abutment surface 61 is provided on a portion projecting from the frame against which abutment surface the upper side of the feed pawl is pressed by the ratchet wheel when the latter has been moved a full step, as is clear from Figure 3, whereby an additional movement of the ratchet wheel on account of its inertia is prevented.

The manner of operation of the impression mechanism above described will now be explained. Normally the contact 70 is actuated by the associated machine, not shown, at regular speed or performance intervals. For each closing of the contact a current impulse of short duration flows from the source of current 22 through the winding 21 of the printing magnet causing the printing hammer 10 to strike against the roller 19. The type which is in operative position then prints, through the intermedium of the coloured ribbon 17, a short transverse stroke on the record strip 18. During the downward movement of the printing hammer 10 the detent 50 engages the ratchet wheel 30, but it is brought back to the position shown in Fig. 1 out of engagement with the ratchet wheel during the following return movement of the printing hammer under the action of the spring 15.

Let it now be assumed that the machine is stopped, for instance due to lack of material. The controller is sent for, to record the cause of the interruption. He then first satisfies himself that the cause of the working interruption actually is lack of material and thereafter opens the box in which the dial is positioned to send the digit code as agreed upon between the manager's office and the workshop. If the digit 5 means working interruption on account of lack of material, the controller dial's the digit 5, six current impulses of short duration being then sent by the impulse contact 37 from the current source 22 through the winding 36 of the type setting magnet. As a consequence the armature 33 is attracted six times in sequence. At the first attraction the armature pushes, through the intermediary of the rod 58, the striking arm 55 out of engagement with the extension 53 of the detent 50, the latter being then brought into engagement with the ratchet wheel 30 under the action of the blade spring 52. At the same time the armature steps the ratchet

wheel 30 forward one step through the intermediary of the feed pawl 31. The parts thereafter occupy the position shown in Figure 3. When during the return movement of the armature 33 under the action of the blade spring 40, the rod 58 is brought out of engagement with the striking arm 55, the latter is moved against the stop pin 57 under the action of the spring 56, whereafter the parts occupy the position shown in Figure 4. As a result of the following four attractions of the armature 33 the ratchet wheel 30 and together therewith the type wheel 13 is moved five more steps so that after receipt of the fifth setting impulse the type 5 on the type wheel is in operative position. The impulse contact 23 is there- after closed, and a current impulse of short duration passes from the current source 22 through the winding 21 of the impression magnet, and the impression hammer 10 is attracted and strikes against the roller 19. The type 5, which is in operative position, then prints the digit 5 on the record strip 18 through the intermediary of the coloured ribbon 17. At the same time the detent 50 is pulled downwards and its extension 53, in passing by the projection on the striking arm 55, pushes away the latter against the action of the spring 56. After the extension 53 has passed by, the striking arm 55 returns to bear against the stop pin 57 under the action of said spring. When the impression hammer 10 is in the attracted position, the parts occupy the position shown in Figure 5. When the impression hammer 10 returns under the action of the spring 15, the striking arm 55 is in the path of the extension 53 on the detent 50, wherefore the detent is rocked by said arm out of engagement with the ratchet wheel 30. The latter then returns under the action of the clock spring (not shown) to its starting position in which the short transverse stroke is in operative position. The parts now again occupy the position shown in Figure 1 and the mechanism is prepared to receive a new series of impulses for recording a new character.

If the mechanism is employed for recording the performances of a plurality of machines it may in some instances be suitable to arrange a plurality of impression mechanisms according to the invention side by side on a common frame and arrange the mechanisms to record the indications on a common record strip in mutually parallel columns. To obtain a good comparison between the different columns it is then necessary that the columns are placed sufficiently close together. For this purpose the electromagnets should be made as thin and flat as possible and all parts appertaining to one unit be arranged between two parallel planes located as close together as possible as is the case in the embodiment of the impression mechanism according to the invention shown on the drawings, see particularly Figure 2.

The setting and impression magnets need, of course, not be arranged in the same manner as in the shown embodiment.

A number of impression mechanisms according to the invention can also be used for recording at a distance the depressed number in cash registers.

The impression mechanism according to the invention can, of course, be designed otherwise than above set forth, within the scope of the appended claims.

I claim:

1. A system for supervising the operation of a remote machine comprising, in combination, a

record strip movable at a uniform speed, a printing hammer, an electromagnet adapted to cause upon energization printing operation of said hammer, a printing type wheel having a printing type of particular shape, such as a transverse stroke, adapted to record a selected condition of said machine and a plurality of other printing types of particular shape, such as digits or other symbols, different from the first mentioned shape and adapted to record other conditions of said machine, a spring device for normally holding said wheel with said first mentioned printing type in operative position, a first contact device arranged in the circuit of said electromagnet adapted to be operated at intervals, thereby causing the first mentioned printing type to print on said record strip, an electromagnetic stepping mechanism associated with said wheel, an impulse sender adapted to send different trains of impulses through said stepping magnet for moving the associated type wheel against the action of said spring device and to bring said other types selectively into operative position, a detent carried by said printing hammer adapted to hold said wheel in a set position, means for causing printing operation of said printing hammer upon completed setting of said type wheel, thereby printing said selected type upon said record strip, a spring operated movable arm adapted to move into the path of said detent during the return movement of said printing hammer and to move said detent into inactive position, said stepping mechanism comprising a stepping pawl and a member adapted to keep said arm out of engagement with said detent during the stepping movement of said pawl.

2. A system for supervising the operation of a remote machine, comprising, in combination, a movable record strip, a printing hammer, a plurality of printing types associated with said hammer, a first one of said types of particular shape, such as a transverse stroke, and normally held in operative position with respect to said record strip, while the other types of different shapes, such as characters or digits, are in inoperative position, an electromagnetic stepping mechanism adapted to be operated by selective current impulses and to move said latter types selectively into operative position in place of said first one, means for restoring a thus selected type into inoperative position after completion of a printing operation, and an electromagnet for causing printing operations of said hammer; an electric circuit including said electromagnet and said mechanism, a contact means in said circuit arranged to be actuated upon normal operation conditions of the supervised machine and to cause printing operation of said electromagnet and hammer with said first type in operative position, and a transmitter of electric impulses in said circuit adapted to inject upon selective actuation a selected number of current impulses into said electromagnet, causing thereby setting of a selected one of said other types indicative of another than normal condition of the supervised machine and printing operation of said electromagnet.

3. A system for supervising the operation of a remote machine, comprising, in combination, a movable record strip, a printing hammer, a plurality of printing types associated with said ham-

mer, a first one of said types of particular shape, such as a transverse stroke, and normally held in operative position with respect to said record strip, while the other types of different shapes, such as characters or digits, are in inoperative position, an electromagnetic stepping mechanism adapted to be operated by selective current impulses and to move said latter types selectively into operative position in place of said first one, means for restoring a thus selected type into inoperative position after completion of a printing operation, and an electromagnet for causing printing operations of said hammer; an electric circuit including said electromagnet and said mechanism, a contact means in said circuit arranged to be actuated upon normal operation conditions of the supervised machine and to cause printing operation of said electromagnet and hammer with said first type in operative position, and a transmitter of electric impulses in said circuit adapted to inject upon selective actuation a selected number of current impulses into said mechanism, causing thereby setting of a selected one of said other types indicative of another than normal condition of the supervised machine, and a contact means associated with said transmitter and adapted to cause printing operation of said electromagnet upon completion of said setting operation.

4. A system for supervising the operation of a remote machine, comprising, in combination, a record strip movable at a uniform speed, a printing hammer, a printing type wheel comprising a plurality of different printing types, a first one of said types of particular shape, such as a transverse stroke, indicative of a normal operation condition of the supervised machine while other types of different shapes, such as characters or digits, are indicative of other conditions, a spring device for normally holding said wheel with said first type in an initial operative position, an electromagnetic stepping mechanism associated with said wheel and adapted to be actuated by selective current impulses and thereby to set said wheel, a detent associated with said printing hammer adapted to hold said wheel in a set position, and an electromagnet for causing printing operation of said hammer; an electric circuit including said electromagnet and said mechanism, a contact means in said circuit arranged to be actuated at regular intervals upon normal operation condition of the supervised machine and to cause printing operation of said electromagnet and wheel with said first type in operative position, a transmitter of electric impulses in said circuit adapted to inject upon selective actuation a selected number of current impulses into said mechanism, thereby rotating said wheel against the action of said spring device and setting a selected one of said other types into operative position, contact means associated with said transmitter for causing printing operation of said printing hammer upon completed setting of said type wheel; and a spring operated movable arm adapted to move during the printing movement of said hammer into the path of said detent and to displace during the return movement of said hammer said detent into its inactive position, thereby permitting said wheel to return to its initial position.

ALFRED KALL.