

June 28, 1938.

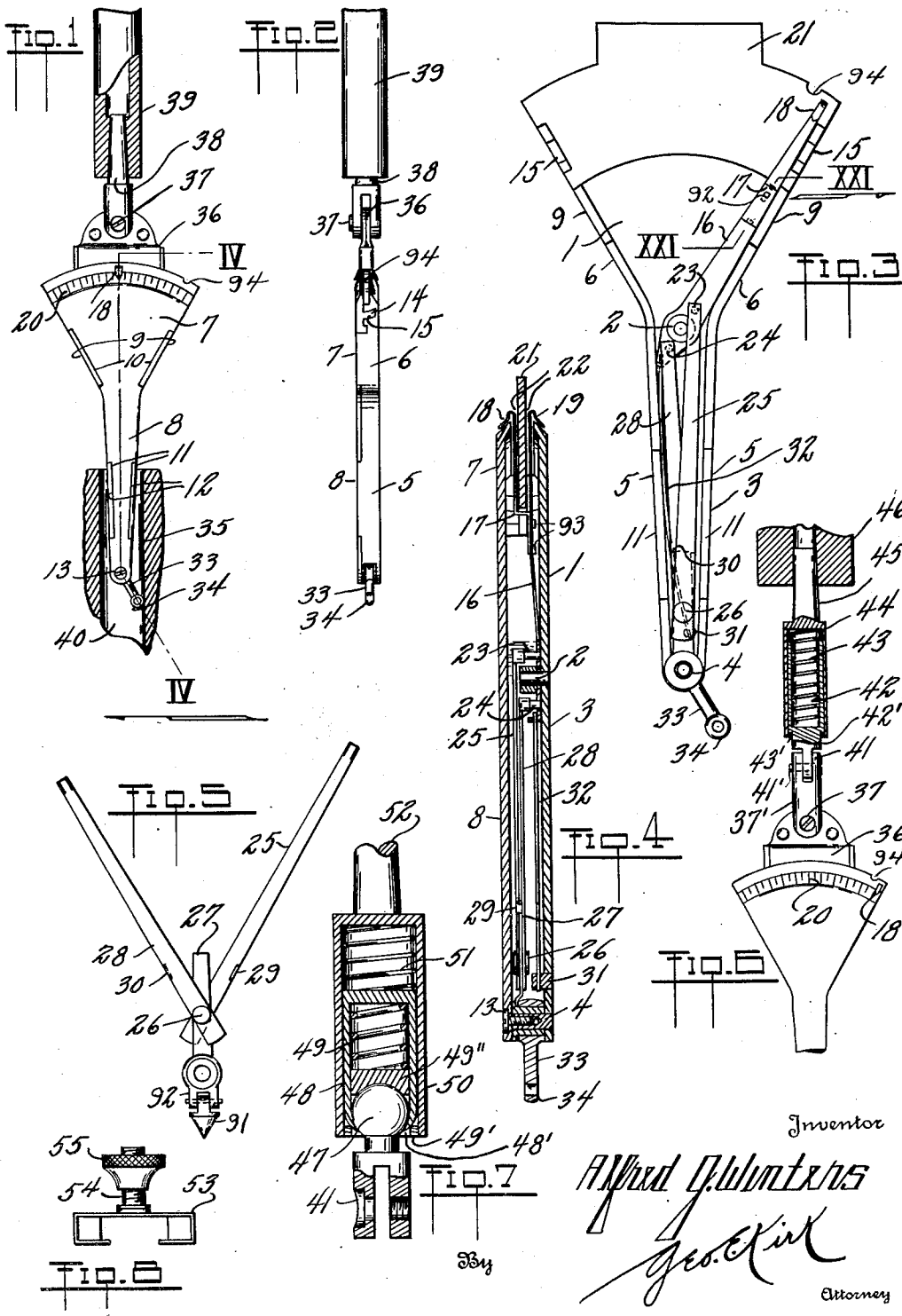
A. G. WINTERS

2,121,848

INDICATOR

Filed July 8, 1935

2 Sheets-Sheet 1



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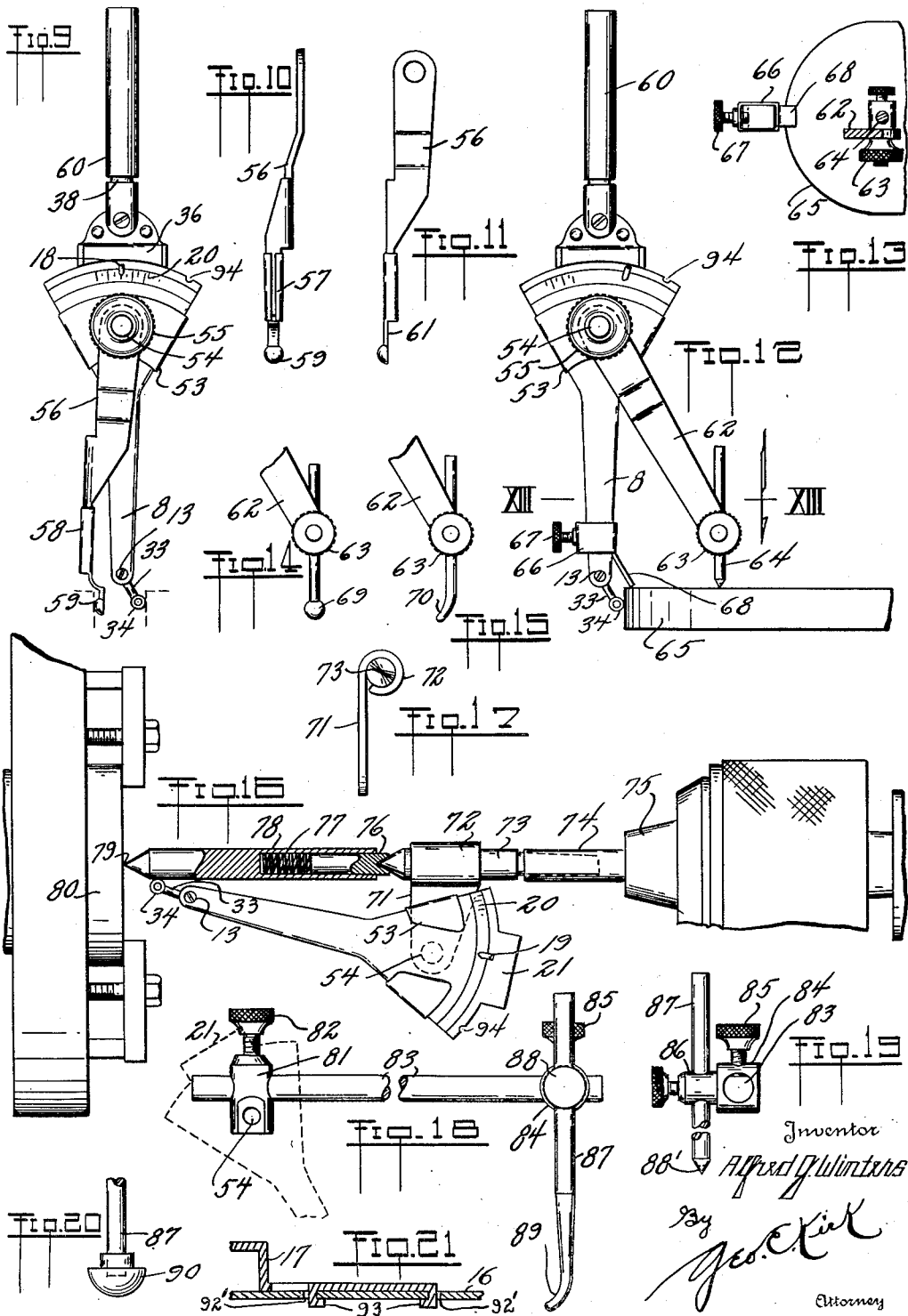
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2 Sheets-Sheet 2



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2,121,848

INDICATOR

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Application July 8, 1935, Serial No. 30,350

7 Claims. (Cl. 33—172)

This invention relates to testing and checking points, lines, and surfaces.

This invention has utility when incorporated in instruments for quickly disclosing alignment and measurements.

Referring to the drawings:

Fig. 1 is a side elevation of an embodiment of the invention in an internal dimension checking tool having a directing mounting therefor;

Fig. 2 is a side elevation of the device of Fig. 1;

Fig. 3 is an enlarged view of the tool with the cover removed for showing the throw-multiplying actuator;

Fig. 4 is a section on the line IV—IV, Fig. 1;

Fig. 5 is a detail view in spread position of the connecting arms between the work contactor and the pointer lever, the contactor being a modified construction from the contactor of Fig. 1;

Fig. 6 is a fragmentary view of the tool having a directing take-up mounting therefor;

Fig. 7 is a detail view of a jointed mounting and a differential take-up;

Fig. 8 is a plan of an arm mounting clamp for the tool;

Fig. 9 is a side elevation of the tool having a directing handle and an arm attached thereto by the arm clamp of Fig. 8;

Fig. 10 is a side elevation of the arm and extension terminus of Fig. 9;

Fig. 11 is a side view of the arm of Fig. 9 with a straight instead of an offset terminus attached therewith;

Fig. 12 is a view of the tool of Fig. 9 having an arm with a clamp-connected point instead of a telescopic terminus, as well as additionally having a rest for locating the contactor as to the work;

Fig. 13 is a partial section on the line XIII—XIII, Fig. 12, the frame being removed;

Fig. 14 is a fragmentary view of a clamp-connected terminus, herein shown as ball instead of point as in Fig. 12;

Fig. 15 is a view similar to Fig. 14, with an offset terminus for the point;

Fig. 16 is a fragmentary view of the tool in center checking position, say as in a horizontal power tool of the lathe type;

Fig. 17 is a detail view of the special arm or bracket for positioning the tool as to the axial extending means shown in Fig. 16;

Fig. 18 is a view of an extension arm or bar for mounting this tool;

Fig. 19 is a view of the terminus of the arm having a pointed instrument instead of an offset

terminus at the arm remote from the tool;

Fig. 20 shows a round nose or spherical terminus for the instrument as used on an extension bar; and

Fig. 21 is an enlarged section on the line XXI—XXI, Fig. 3.

The main frame is shown with fan-shaped portion 1 (Fig. 3) at the narrow portion of the fan having fulcrum 2 and therefrom narrowed portion 3 to terminal fulcrum 4. Side walls 5 from the fulcrum 4 to adjacent the fulcrum 2 form the portions from the frame member 3 as a channel, while side flanges 6 along the widening portion 1 provide walls effective in cooperation with companion frame member 7, 8, in completing the housing for this indicator tool. Interlocking tongues 9 from the side flanges 6 of the frame member 1, 3, enter recesses 10 in the frame member 7, 8. Tongues 11 from the flanges 5 of the member 1, 3, extend into openings 12 in the member 7, 8. Fulcrum screw 13 is helpful in completing this assembly together with curved tongues 14 from the member 7 entering recesses 15 in the member 1.

Mounted on the fulcrum 2 is pointer lever 16 having offset 17 thereby carrying pointer terminus 18 on one side and 19 on the other side of graduations 20 on the members 1, 7, adjacent tongue member 21, mounted in the frame with openings 22 on each side thereof for clearance in allowing the pointers 18, 19, to shift as the lever 16 rocks on its fulcrum 2. This lever 16 on the side of the fulcrum 2 toward the pointers has pin 23 and on the opposite side, pin 24. From the pin 23 as transmission engagement means, there extends arm 25 to pivot mounting 26 on arm 27 of contactor lever mounted on the fulcrum 4 coaxial with the screw 13. From the pin 24 as transmission engagement means, there extends adjacent the arm 25, arm 28 to the common pivot mounting 26. These arms 25, 28, have terminal channels at the pins 23, 24, directly rocking the lever 16. In the other direction, the arms 25, 28, extend beyond the pivot mounting 26 toward the fulcrum 4. However, the arm 25 has offset 29 more remote from the fulcrum 4 than the pivotal mounting 26, to be engaged by the lever 27 in its swing in one direction on the fulcrum 4, thereby to serve as transmission engagement means for the arm 25 as acting therethrough upon the lever 16. Likewise, the arm 28 has offset 30 to be engaged by the lever 27 in the reverse movement from that effecting the arm 25 in thus providing transmission engagement means for the arm 28 to the lever 16.

Fixed by pin 31 with the frame portion 5 is

spring 32 as of wire extending to the lever 16, thereby serving as normal recovery or resistance means in bringing the pointers 18, 19, to neutral or zero position as that effective when the contactor lever is centered or idle.

Frictionally mounted by the fulcrum 4 with lever arm 27 is contactor arm 33 of this lever 27, 33. This lever 33 may have a curved or slightly spherical terminus portion 34 for its effective working face in the use of the tool as engaging surface 35 (Fig. 1).

The tongue member 21 as extending or protruding beyond the scales of graduations 20 and therebetween may be engaged by friction pocket 36 (Fig. 1) having connection by pivot screw 37 with tapered stem 38, which may enter directly an adaptor or shank 39, wherein may have been used the tool for developing opening 40 having the surface 35.

In the instance that there be a question of irregularities to be met in the opening 40, which should not be harmful to the indicator 2 herein, friction pocket 36 may have on its stem 38, assembled by clamp mounting 41, tubular member 42 having therein spring 43. The member 42 may be retained by friction ring 43'. This tubular member 42 is in sleeve 44 against which the spring 43 acts when thrust into tapered terminus 45 from the sleeve 44 of chuck 46. There is thus provided a yieldable longitudinal take-up for the instrument or tool hereunder in the work with occasion for directional side adjustment through pivot screw 41' between stem 37' and stem 42'.

Instead of assembling tubular member 42 with the clamp mounting 41, there may be spherical head 47 (Fig. 7) as an element of a universal joint to take care of adjusting or centering to a degree in any direction by tubular member 48 having major spring 49 housed therein and substantially force fit retained by friction ring 49'. Disk 49'' is thrust by the spring 49 to hold the head 47 seated in reduced dimension flange 48'. This tubular member 48 is in sleeve 50 and houses minor or weaker spring 51 in spacing the tubular member 48 from tapered chuck engaging terminus 52.

The fan-shaped portion of the tool may have embracing member 53 (Fig. 8) effective as a clamp carrying threaded stem 54 with knurled nut 55 thereon. This knurled nut 55 may serve as a clamp for arm 56 (Figs. 9, 10), herein shown as having terminal stem portion 57 with which split tubular member 58 may telescopically frictionally coact in mounting cupped terminus 59 offset toward the axis of the stem 54, shown as close to the medial line on the graduations 20 and the line therefrom through the fulcrum 2, 4.

This means that, with this type of instrument provided, say with directing handle 60 on the stem 38, this caliper or measuring device may function in a small opening in work. In practice, with the device having a frame of nearly three inches in length and approximately one-quarter inch in width adjacent the fulcrum 2, operations may be in an opening of as small as three-sixteenths inch internal diameter. The terminal stem portion 57 provides a readily attachable mounting for different types of work-engaging portions or extensions, and instead of offset extension 59, there may be different type as straight extension 61 (Fig. 11).

Furthermore, from the knurled nut 55 on the screw or threaded portion 54, there may be arm 62 having terminally thereof clamping screw 63 for mounting auxiliary instrument 64 (Fig. 12),

herein shown as a pointer. In this use it is desirable that the contactor 34 in some instances, as when surface 65 being measured may have irregularities, be determined from the instrument 64 while maintained at a determined position. This is accomplished by clamp 66 embracing the main frame and adjusted by knurled screw 67. From this clamp there is finger 68 to contact the work 65. Thus the location of the contactor 34 is against shifting relatively to the auxiliary instrument 64 when the tool has its position directed by the operator engaging the directing handle 60 and is thus steadied.

Clamping screw 63 may mount, instead of pointed instrument 64, a ball terminus instrument 69 (Fig. 14) or offset terminus 70 (Fig. 15). Upon screw stem 54 instead of the arm 56, the nut 55 may clamp in position bracket member 71 (Figs. 16, 17) having terminal loop 72 embracing centering stem 73 having connection through member 74 with chuck 75.

This bar 73 is shown in engagement with plunger 76, yieldably thrown by spring 77 in sleeve 78 of yieldable take-up device or wiggler having centering point 79 remote from the bracket 71. This pointer 79 is desirably located to find center of relatively rotating work 80 opposing the chuck 75 of the tall stock, for a grinder, drill press, lathe, boring mill, milling machine, or other type of power tool or locator in horizontal or other set-up.

Laterally contacting this wiggler 78 adjacent the centering point 79 is the contactor 34, thus in throw-multiplying responsive position as to this tool. The operator is thus enabled accurately to locate a point for centering on work in a machine set-up. Location of the tool in a position may be determined upon a surface of work and is conveniently had by assembling on the screw stem 54 block 81 (Fig. 18) having adjusting screw 82 to engage bar 83 as an extension, such bar having a flat side as a key against angular shifting when locked in position. This bar 83 may have supplemental block 84 anchored therewith through set screw 85. This block 84 has opening 86 for minor instrument 87 locked by set screw 88. This instrument 87 may have centering point 88' (Fig. 19). In other practices it may be desired to provide offset point 89 (Fig. 18). Additionally, in certain classes of work it may be desired to use a spherical terminus 90 (Fig. 20).

In lieu of the contactor 34, there may be provided cone-shaped actuator 91 (Fig. 5) on lever arm 92 substituted for the arm 33. Use of the take-up (Fig. 6) may be effective when the work is adjusted into contact with the actuator 91.

The device of the disclosure herein is one, accordingly, having a range of ready adaptability for accuracy in caliper, measuring, or determining calibration accuracies. This practical use is in a wide range for accuracy or minute measuring, even as to the instrument being remote in its positioning as to a point of control as through the bar 83. The accuracy is for use in quite small places but with a pointer movement responsive to ready observation by the operator of the tool.

The pointers 18, 19, may be assembled into a unit (Fig. 21) by providing openings 92' in the arm 16, and ears extending therethrough from adjacent the offset 17 and clamping the termini 70 of the ears 93 against the opposite side of the arm 16. The plate 21 may be provided with notch 94 adjacent the zero markings on the indicator. This provides a visible indication especially while the indicator is rotating.

What is claimed and it is desired to secure by Letters Patent is:

1. An indicating instrument comprising a main frame, an indicator mounted thereby including a pointer lever, a pivotal mounting for the lever in the frame, a throw-multiplying actuator for the pointer lever embodying a contactor lever, a fulcrum mounting for the contactor lever remote from the pointer lever pivotal mounting, a pair of arm means between the levers having common pivotal connection to the contactor lever on the side of its fulcrum toward the pointer lever, said arm means each having transmission means in position for engagement with one of said levers away from the pivotal mounting and fulcrum, the transmission engagement means for one arm being effective in one direction of contactor movement and the means for the other arm being effective in the opposite direction of contactor movement.

2. An indicating instrument comprising a main frame providing a housing, an indicator mounted thereby including a pointer lever, a pivotal mounting for the lever in the frame, a throw-multiplying actuator for the pointer lever embodying a contactor lever, a fulcrum mounting for the contactor lever remote from the pointer lever pivotal mounting, said housing fully enveloping the mountings, and multiple transmission means including two alternatively operable arms wholly within the housing each pivoted to the actuator lever, one of said arms actuable from the contactor lever in one direction of movement to throw the pointer lever and the other of said arms operable from the contactor lever reverse movement to throw the pointer lever.

3. An indicating instrument comprising a main frame providing a housing, an indicator mounted thereby including a pointer lever, a pivotal mounting for the lever in the frame, a throw-multiplying actuator for the pointer lever embodying a contact lever, a fulcrum mounting for the contactor lever remote from the pointer lever pivotal mounting, and a pair of independently actuable diverging arm means wholly within the housing between the pointer and contactor levers having pivotal connection to one of the levers away from the mounting of such lever and one of the arm means extending past the other of the arm means arranged to actuate the indicator from one direction of contactor lever movement and the other of the arm means arranged to actuate the indicator upon contactor lever movement in the opposite direction.

4. An indicating instrument comprising a main frame providing a housing, an indicator mounted thereby including a pointer lever, a pivotal mounting for the lever in the frame, a throw-multiplying actuator for the pointer lever embodying a contactor lever, a fulcrum mounting for the contactor lever remote from the pointer lever pivotal mounting, and dual arm means wholly within the housing and between the pointer and

contactor levers having pivotal connection to the contactor lever on the side of its fulcrum toward the pointer lever, said contactor lever cooperating in one direction of movement with one of the arm means to actuate the pointer lever and said contactor in its other direction of movement cooperating with the other of the arm means to actuate said pointer lever.

5. An indicating instrument comprising a main frame, an indicator mounted thereby including a pointer, a pair of relatively movable throw-multiplying actuator arms for the pointer, a contactor lever arranged to shift one arm in one direction of movement and the other arm in the opposite direction of movement, a fulcrum mounting for the contactor lever remote from the pointer, and detachable means adapted to be fixedly adjusted as to the frame laterally adjacent said fulcrum and extending away from and in addition to said mounting into proximity for also contacting work adjacent the contacting lever and in assembly therefrom locating the lever definitely as to the work, thereby determining distance transmission disclosure to the pointer as effected in locating the lever by said means.

6. An indicating instrument comprising a main frame, an indicator mounted thereby including a pointer, a pair of throw-multiplying actuator arms for the pointer, a contactor lever arranged to shift one arm in one direction of movement and the other arm in the opposite direction of movement, a fulcrum mounting for the contactor lever remote from the pointer, a common axis pivotal mounting on which the arms are independently rockable, and terminally offset detachable means adapted to be angularly fixedly adjusted as to the frame in lateral proximity to said frame and extending away from and in addition to said mounting to the region of the contactor lever to provide a fixed work-contacting position by engaging the work laterally from the region of the work contacted by the contactor lever, thereby determining distance transmission disclosure to the pointer as effected in locating the lever by said means.

7. An indicating instrument comprising a main frame, an indicator mounted thereby including a pointer, a pair of independently oppositely shiftable throw-multiplying arms actuator for the pointer, a contactor lever arranged to shift one arm in one direction of movement and the other arm in the opposite direction of movement, a fulcrum mounting for the contactor lever remote from the pointer, and a work-contacting detachable finger away from and in addition to said mounting, said finger being adapted to be fixedly adjusted as to the frame adjacent the contactor lever laterally of its fulcrum to provide instrument setting means at the work in proximity to the contactor lever, thereby determining distance transmission disclosure to the pointer as effected in locating the lever by said means.

ALFRED G. WINTERS.

4.

CERTIFICATE OF CORRECTION.

Patent No. 2,121,848.

June 28, 1938.

ALFRED G. WINTERS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 42, claim 3, for the word "contact" read contactor; and second column, line 49, claim 7, for "arms actuator" read actuator arms; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of August, A. D. 1938.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.