Oct. 4, 1932. A. J. DOUGHTY 1,880,896

KEYBOARD FOR CALCULATING MACHINES

Original Filed Jan. 3. 1927

Fig. 1.

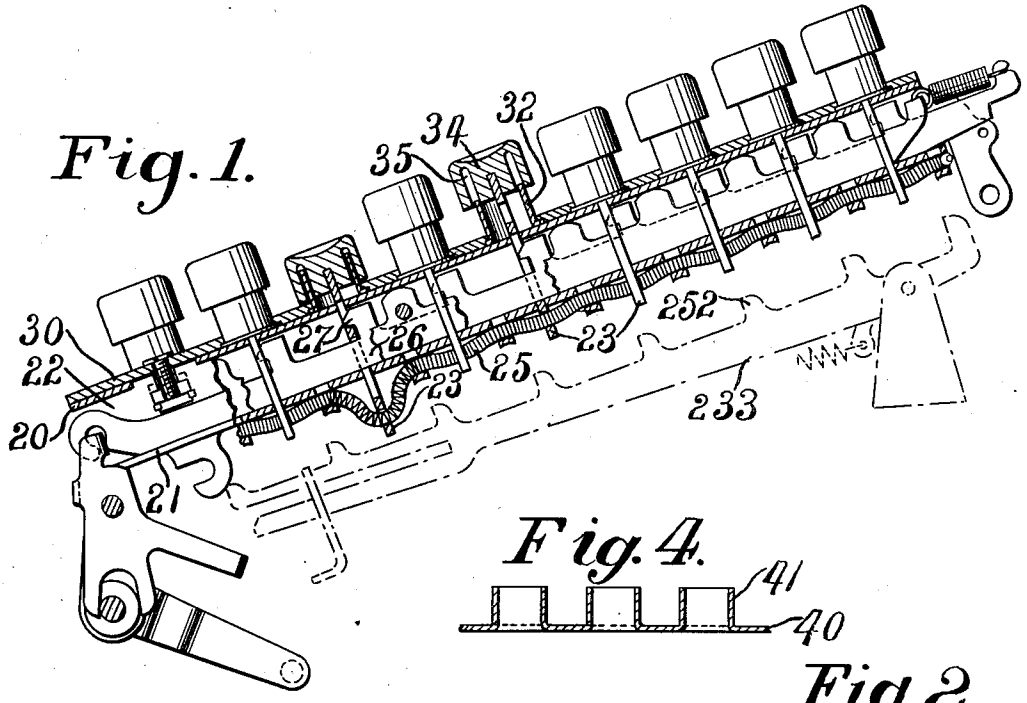


Fig. 4.

Fig. 2.

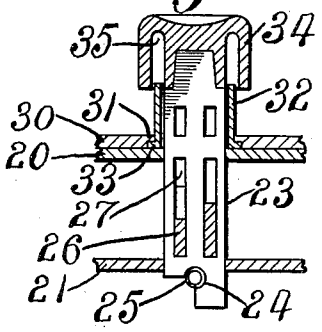
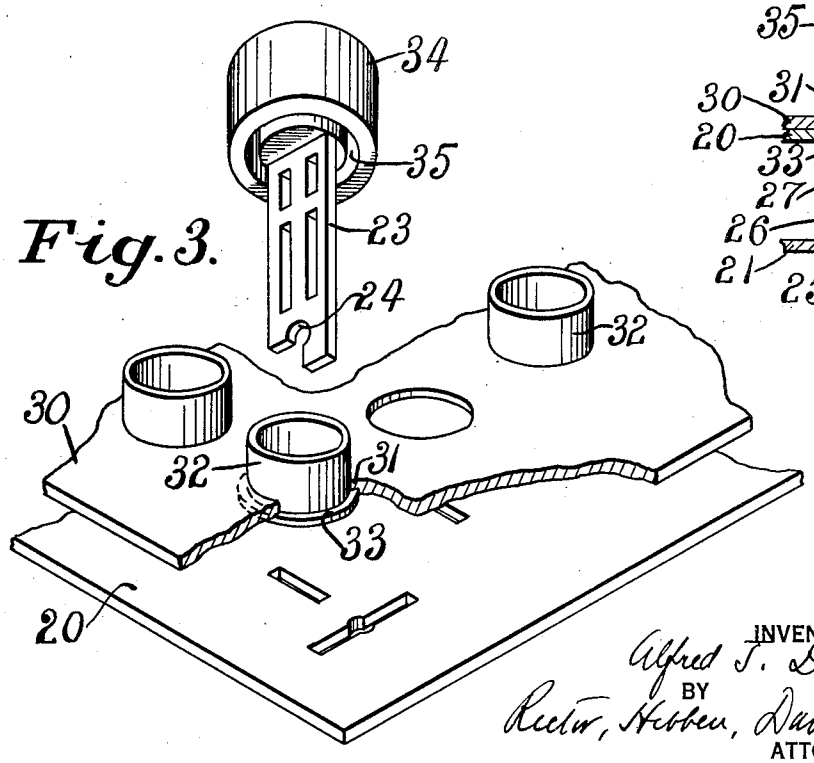


Fig. 3.



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UNITED STATES PATENT OFFICE

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KEYBOARD FOR CALCULATING MACHINES

Continuation of application Serial No. 158,444, filed January 3, 1927. This application filed August 18, 1930. Serial No. 476,081.

This invention relates to a keyboard for calculating machines and is concerned principally with a construction for preventing moisture from reaching the mechanism of the machine through the openings for the key stems. The application is a continuation of my prior application, Serial No. 158,444, filed January 3, 1927.

Calculating machines, particularly those of the portable type, are often used in grocery stores, produce markets, butcher shops, and other places where water or other liquids may be dropped on the machine from materials being handled or from the hands of the operator who must operate the machine while handling wet articles. In such cases moisture may get on the keys or between them and work through the openings in the key stems until it reaches the mechanism of the machine where it may cause rust to form and interfere with working of the parts. The present invention has been devised to overcome this difficulty.

The general object of the invention is to provide an improved moisture-proof keyboard for calculating machines.

A more particular object is to provide a keyboard for calculating machines in which the construction of the parts associated with the key stems is such that no moisture can enter the machine through the openings for the key stems.

Other objects and advantages of the invention will appear from the specification and drawing.

An embodiment of the invention is shown in the accompanying drawing, in which

Figure 1 is a sectional side elevation of the improved keyboard showing some of the keys in section;

Fig. 2 is a section of one of the keys and of the associated parts taken at right angles to the section of Fig. 1;

Fig. 3 is a separated perspective showing the construction of the keyboard; and

Fig. 4 is a sectional view of a modified form of a portion of the keyboard.

The invention is shown in connection with a keyboard of the type used on the Burroughs portable calculating machine, but it will be understood that it may also be used with other types of keyboards.

The keyboard has a top plate 20 and a bottom plate 21 which are held together in spaced relation by spacing plates 22 only one of which is shown. The top and bottom plates may be any suitable size, but they are usually of such size as to support nine banks of amount keys and one bank of control keys. The two plates form the body of the keyboard which supports the keys, the latches therefor, and the various other parts which make up the keyboard unit that may be attached to and detached from the machine.

Projecting through openings in the top and bottom plates are the stems 23 of the keys of the machine. Fig. 1 shows the stems of one bank of amount keys, it being understood that there are other banks of amount keys and a bank of control keys having stems of similar construction. The lower ends of the key stems are provided with openings 24 for the reception of a coil spring 25 which acts to return depressed keys after they have been unlatched. The depression of one of the keys expands the spring, as illustrated in Fig. 1, and the depression of any one of the other keys in the same bank or the unlatching of these keys when the machine has been given a stroke of movement, results in the spring 25 returning the depressed key to its normal position. The keys of each bank are latched in depressed position by a latch 26 comprising a plate having a series of noses 27 projecting into slots in each of the key stems. One of the latches is shown depressed in Fig. 1. It will be observed that the noses 27 project into the slots so that as one of the keys is depressed the latch plate 26 is

moved rearwardly to unlatch any depressed key to permit it to be returned by the spring 25. When depressed, the lower ends of the key stems project into the paths of stops 252 carried by stop bars 233 which move forward during operation of the machine.

In order to prevent moisture from entering the machine at the openings in the plates through which the key stems project a novel improvement has been developed which may be applied to a keyboard without changing its construction. A secondary or supplemental top plate 30 is provided having cylindrical openings of considerable size for each key stem. These openings are countersunk or recessed to form a shoulder at 31 as shown in Fig. 2. Mounted in these openings are cylindrical sleeves 32 having flanges 33 which are held between the shoulders 31 of the openings in the plate 30 and the surface of top plate 20. There is one of these sleeves for each stem and it extends upwardly around the key stem a substantial distance. Each key stem is then provided with a key top or finger piece 34 having a circular recess 35 in its lower face for the reception of the cylindrical sleeve 32. In the undepressed position of a key, the sleeve 32 just extends into the opening or recess 35 in the key top 34 so that no moisture can enter over the top of the sleeve. When a key is depressed to the position in which one of them is shown in Fig. 1, the sleeve 32 enters the recess 35 without interfering with the movement of the key.

With this construction any moisture that may be dropped on the keyboard will not enter the opening for the key stem because these are each thoroughly protected by the surrounding sleeve which fits tightly against the top plate 20 and in the opening in the auxiliary plate 30. No moisture can enter the top of the sleeve because the key top covers it. The interior mechanism is thus effectually protected against the entry of moisture and the calculating machine may be safely used in surroundings which otherwise would be detrimental because of the damaging action caused by water and acids entering the mechanism through the keyboard.

A modified construction of auxiliary top plate is shown in Fig. 4 in which the plate 40 has the cylindrical sleeves 41 struck up from the metal of the plate itself. This provides an integral construction in which there is no possibility of any leaking at the joints between these sleeves and the plate but for all ordinary purposes it is sufficient, as far as water-proofing is concerned, to employ the construction shown in Figs. 1, 2 and 3.

It is to be understood that the construction shown is for purposes of illustration only and that variations may be made in it without departing from the spirit and scope of the invention as defined by the claims.

I claim:

1. A calculating machine having a keyboard provided with openings to receive key stems, depressible amount keys having stems mounted loosely in said openings to reciprocate freely therein, and tubular projections extending upward from said keyboard around each key stem, said keys having portions in loose telescoping relation with said projections to permit free depression of the keys, the telescoping portions being constructed so that the telescoping relation is preserved both when the keys are depressed and when they are undepressed to thereby prevent moisture from getting into the interior of the machine through the openings in the keyboard.

2. The combination in a calculating machine of a keyboard having openings for receiving key stems, depressible amount keys having stems mounted loosely in said openings to reciprocate freely therein, tubular projections extending upward from said keyboard around each key stem, and key tops on said key stems having annular recesses in their bottom faces into which said tubular projections extend when the keys are in normal undepressed position, said recesses being of sufficient depth to freely receive the tubular projections when the keys are depressed and being sufficiently large to receive said projections without friction so as not to interfere with the easy depression of the keys.

3. The combination with a calculating machine having a keyboard provided with a top plate having openings for key stems and depressible amount keys having stems mounted loosely in said openings to reciprocate freely therein; of a moisture-proofing attachment for said keyboard comprising a supplementary plate adapted to fit over said keyboard top plate, tubular projections on said supplementary plate extending upward around each key stem, and substitute key tops for said key stems, said key tops having annular recesses in their bottom faces into which said tubular projections extend when the keys are in normal undepressed position, said recesses being of sufficient depth to freely receive said projections when the keys are depressed and being sufficiently large to receive said projections without friction so as not to interfere with the depression of the keys.

4. The combination with a calculating machine having a keyboard provided with a top plate having openings to receive key stems and depressible amount keys having stems mounted loosely in said openings to reciprocate freely therein; of a moisture-proofing attachment comprising a supplementary plate adapted to fit over the keyboard top plate, said supplementary plate having recessed openings registering with the openings in the top plate, tubular projections having shoul-

ders positioned between the keyboard top plate and the shoulders of said recessed openings in said supplementary plate, and substitute key tops for said key stems having annular recesses in their bottom faces into which said tubular projections extend when the keys are in their normal undepressed positions, said recesses being of sufficient depth to freely receive said projections when the keys are depressed and being sufficiently large to receive said projections without friction so as not to interfere with the depression of said keys.

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