

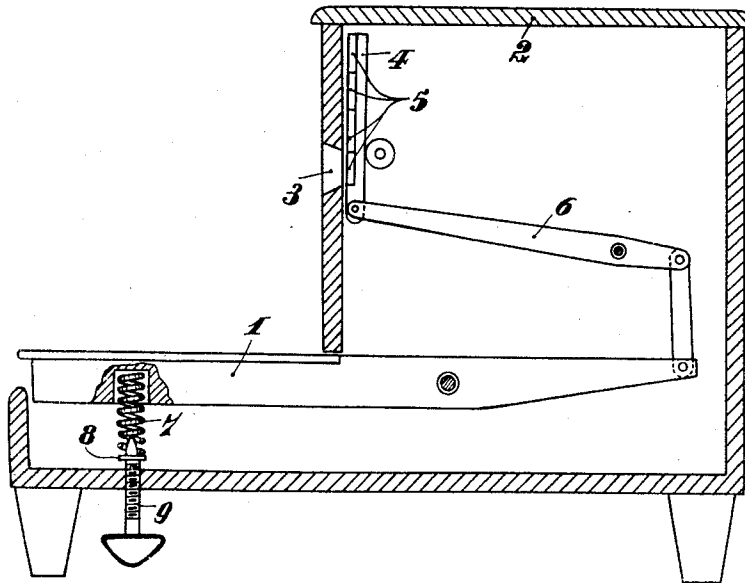
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E. L. ROTH

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FINGER EXERCISING DEVICE

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Inventor.  
Eugene Louis Roth.  
per: *[Signature]*  
Attorney.

## UNITED STATES PATENT OFFICE

EUGÈNE LOUIS ROTH, OF ANTWERP, BELGIUM

## FINGER-EXERCISING DEVICE

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The present invention relates to an improved finger-exercising device in order to develop or to correct the natural individual strength of each separate finger.

5 For this aim, the device of the invention is provided with a key-board comprising keys to be depressed in combination with separate resistances opposed to the depression of each key under the pressure of the finger, each  
10 resistance being liable to be adjusted in accordance with the natural individual strength of the finger acting upon the key.

The device according to the present invention comprises in combination with said elements, means by which the variations of pressure exerted by each finger are controlled  
15 instantaneously and automatically indicated. The greater sensitivity of the apparatus will allow of a more objective control of pressure  
20 exerted by each finger, so that the time spent in training the hands can be considerably shortened.

The finger-exercising device comprises a casing provided with key bed and key board  
25 and movable and marked indicators will be mounted inside the casing so that they can be observed from the outside, for instance through a narrow slit in the wall of the casing. The depression of the keys is trans-  
30 mitted to the indicators by means of links and amplifying levers. The indicators will bear graduated scales or coloured markings, so that particular control is possible over the action of each finger in relation to the other.

35 The device is provided with suitable means allowing adjustment of the pressure required to depress the keys, so that the apparatus can be appropriated to pupils of different age or strength.

40 An embodiment of the invention will be described hereafter, by way of example, with reference to the accompanying drawing the single figure of which shows a vertical cross section of the apparatus.

45 The casing 2 comprises a key bed with key board 1 of known construction and the front-wall of said casing has a longitudinal opening 3. The board will have preferably ten keys. The opening 3 will be of such a dimension as to allow easy observation of the col-

oured indicators 4 which are movably mounted behind the front wall. There is one indicator corresponding to each key and the front face of the indicators will bear graduated markings 4 or coloured zones so arranged that  
55 perfect control is possible over the depression of the key under the pressure exerted by each finger.

Said markings will appear in succession in the opening 3 when the keys are depressed. It is obvious that the motion of the indicators  
60 may be different of that shown in the drawings. For instance, instead of being directed downwards it may be directed upwards. It may also be horizontal instead of being vertical. Each indicator is connected to its corresponding key by means of a link and amplifying lever 6.  
65

The keys and indicators are brought back in their normal inoperative position by the  
70 usual means. Under each key can be placed a return spring 7 the tension of which can be adjusted and as the resistance of said spring is made proportional to the depression of the key under the pressure of the finger, the indicator in front of opening 3 will immediately  
75 give the value of the pressure exerted by the finger upon the key.

Adjusting means are provided to vary the resistance of the keys. For instance the  
80 spring 7 will rest upon the shoulder 8 of a regulating screw 9, so that the initial tension of the spring can be varied in accordance with the natural strength of each finger pressing on the key.

85 The device as described allows rapid training of the pupils in view of compensating the natural difference of strength in the fingers. Indeed when all the fingers of the two hands will equally act upon the keys, the same  
90 marks of all the indicators will appear in the opening 3. If one of the fingers will act with more or less pressure than that which the pupil will realize, the correspondent indicators will give a different mark or colouring  
95 in the opening.

The device as described herebefore allows the training of fingers in a very rapid way, with perfect control, so that after a short time the pupil can act with desired strength  
100

by each finger, avoiding the inconvenience in presently known methods, to compensate the movements of the fingers by false movements of the hand or the wrist.

5 Furthermore, the device presents the advantage of allowing the exercising by means of perfectly adjustable reacting forces and in its whole it is of most simple and useful construction.

10 I claim:

1. A finger-exercising device to obtain and to preserve the normal relation between the individual natural strength of different fingers, comprising in combination: a casing,  
15 a key-board with the keys to be depressed extended backwardly into the casing, movable coloured indicators sliding inside the casing behind the front wall of the same, each indicator bearing similarly disposed  
20 coloured markings, a longitudinal opening extending over the whole length of said front wall, a series of transmitting levers consisting of one for each key connecting said indicators with the keys and causing an indicator to move downwardly in front of said  
25 opening when the corresponding key is depressed, springs arranged to oppose resistance to the depression of said keys, each spring acting on a different key, a regulating screw for each spring, said screws being  
30 screwed in the casing, a shoulder for supporting said spring, provided at the inner end of each regulating screw, the arrangement being such that, by screwing any of  
35 said screws, the tension of its corresponding spring is adjusted in accordance with the natural strength of each finger, substantially as described.

2. A finger-exercising device to obtain and  
40 to preserve the normal relation between individual natural strength of different fingers comprising in combination: a casing, a key-board with the keys to be depressed extended backwardly into the casing, movable coloured  
45 indicators sliding inside the casing behind the front wall of the same, each indicator bearing similarly disposed coloured markings, a longitudinal opening extending over the whole length of said front wall, a series  
50 of transmitting levers consisting of one for each key connecting said indicators with the keys and causing an indicator to move downwardly in front of said opening when the corresponding key is depressed, the arrange-  
55 ment being such that a constant comparison between the simultaneous position of the various keys is enabled, substantially as described.

In testimony whereof I signed hereunto  
60 my name.

EUGÈNE LOUIS ROTH.