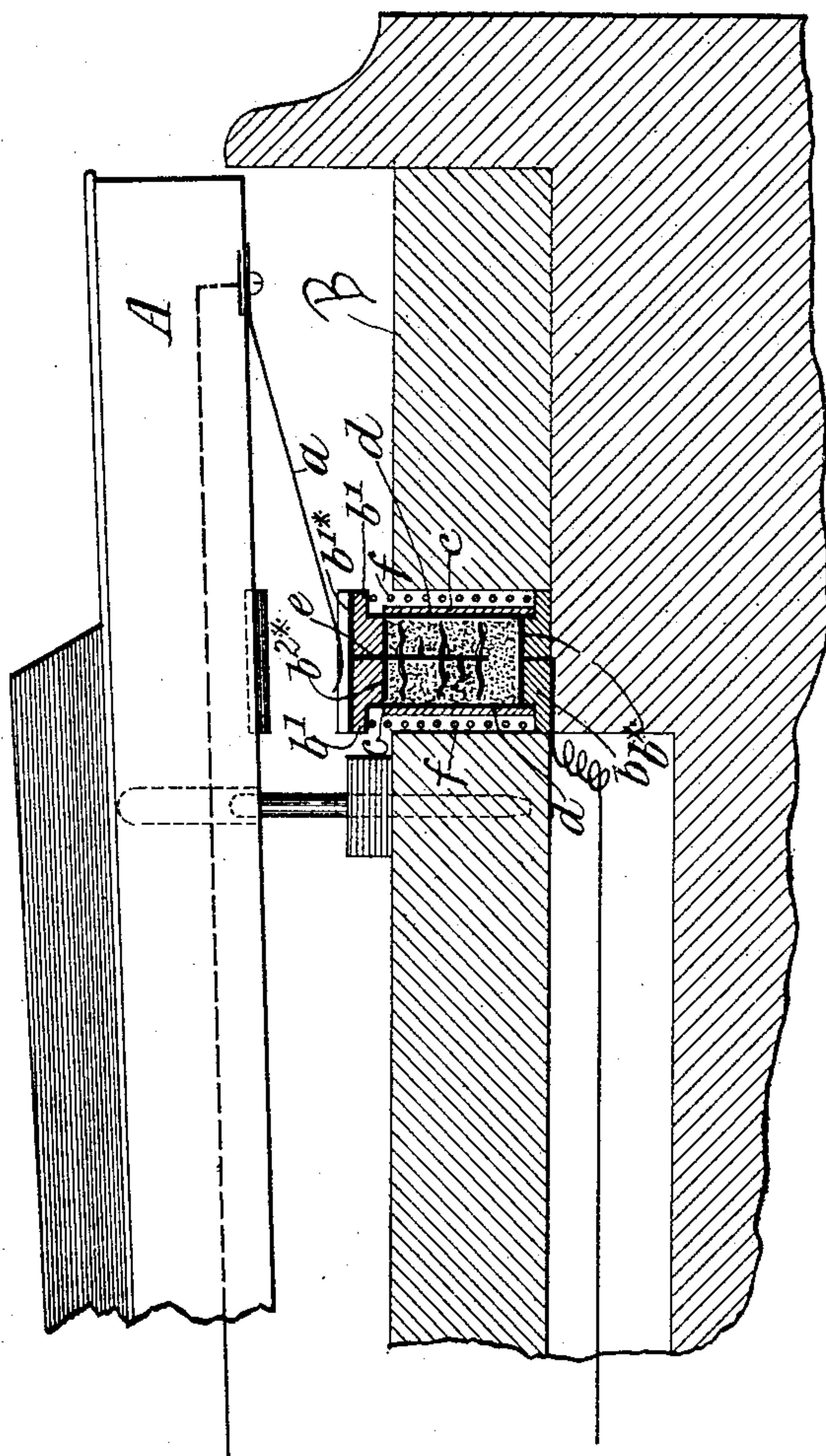


(No Model.)

P. E. SINGER.  
ELECTRIC MUSICAL INSTRUMENT.

No. 501,543.

Patented July 18, 1893.



*Attest:*  
William H. Kennedy  
J. M. Borst

*Inventor:*  
Paris E. Singer  
by  
Phaff Munroe Phelps  
Attys

# UNITED STATES PATENT OFFICE.

PARIS E. SINGER, OF LONDON, ENGLAND.

## ELECTRIC MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 501,543, dated July 18, 1893.

Application filed February 21, 1893. Serial No. 463,246. (No model.)

*To all whom it may concern:*

Be it known that I, PARIS EUGENE SINGER, of 6 Victoria Road, Kensington, London, England, have invented certain new and useful  
5 Improved Methods of Varying the Resistances of an Electric Circuit Specially Applicable to Musical Instruments, of which the following is a specification.

The object of my invention is to enable a  
10 performer on a musical instrument actuated by electricity, to vary the intensity of any note by increasing the pressure of the finger on the key by which it is sounded.

In carrying out my invention, I place a re-  
15 ceptacle containing a quantity of carbon powder, or equivalent material, in proximity to each key, and so arrange it that the depression of a key will, through the interposed carbon, close the electric circuit which oper-  
20 ates the instrument. Further pressure on the key will, by compressing the carbon powder, lessen the resistance, and thereby intensify the sound.

The accompanying drawing shows so much  
25 of an electrical pianoforte as will serve to explain the manner of carrying out my invention.

A is the pianoforte key, fitted with a contact spring *a*, in electrical connection with  
30 the battery.

B is a plank running across the pianoforte immediately below the keys, in which are bored out cylindrical recesses or chambers (one for each key) to receive the carbon fill-  
35 ing which is to form a link in each key circuit. *b* is a disk of ebonite, fitting the bottom of the recess in the plank B, and carrying a metal plate *b*\* in contact with the wire that leads from the battery. Resting upon  
40 the disk *b*, is a rigid tube *c*, which serves to contain a tube *d* of india rubber, which is charged with carbon powder. This tube *d* stands up somewhat higher than the tube *c*, and above it is placed an ebonite disk *b*',  
45 which carries a metal plate *b*'\* on its upper side, and a metal plate *b*²\* on its under side, the two plates being connected together by a

rod *e*, which extends deep down into the carbon powder, for the purpose to be presently explained.

The disk *b*' is supported by a helical spring  
50 *f*, which surrounds the tube *c*, and occupies the space between it and the cylindrical recess in the plank B. It will now be understood, that if pressure is put upon the key A  
55 by the finger of the player, the spring *a* will press upon the metallic plate *b*'\* of the disk *b*', cause the spring *f* to yield, and bring the metal plate *b*²\* down upon the carbon in the elastic tube *d*, and compress the carbon there-  
60 in. This compression of the powdered carbon will, in proportion to the energy exerted by the player, establish a circuit of more or less resistance, and thereby vary the inten-  
65 sity of the note sounded as desired.

To prevent the powdered carbon becoming solidified by the repeated pressure to which it is to be subjected, the rod *e* is fitted with radial arms, which, through the endwise move-  
70 ment of the rod up and down in the tube *d*, will loosen or disintegrate the powdered carbon and prevent it caking.

I may remark that, in place of the powdered carbon, small disks or pellets of carbon may  
75 be employed, the same being placed in the tubular receptacle *d*, and pressed upon by the metallic plate *b*²\*.

What I claim is—

In a stringed musical instrument actuated  
80 by electricity under the control of finger keys, a yielding or elastic contact maker, consisting of granules, disks, or pellets of carbon or equivalent material, contained within, and supported by, a tube or chamber below  
85 the finger key, and connected with the battery wire, the carbon "filling" of such tube or chamber being exposed to electric contact with a metallic plate or button carried by the overlying finger key, as and for the purpose above set forth.

PARIS E. SINGER.

Witnesses:

W. K. WHITE,  
A. W. SPACKMAN.