

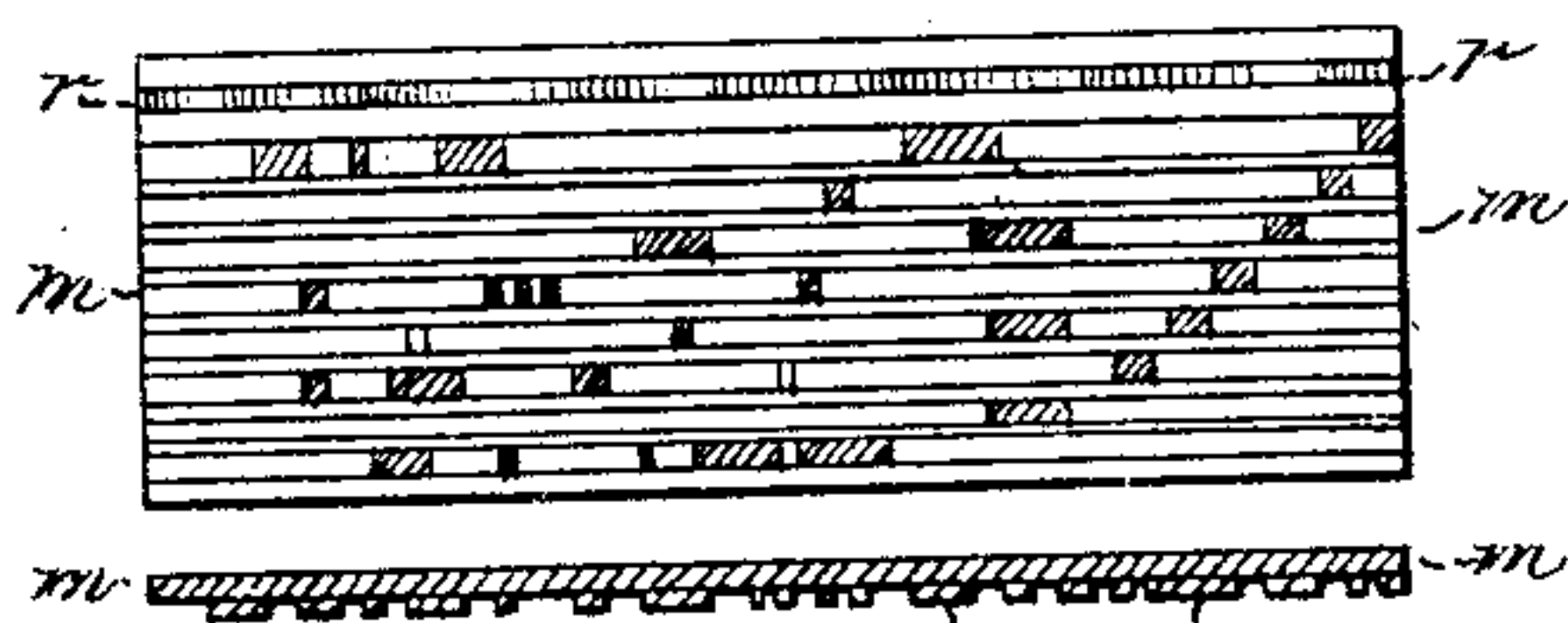
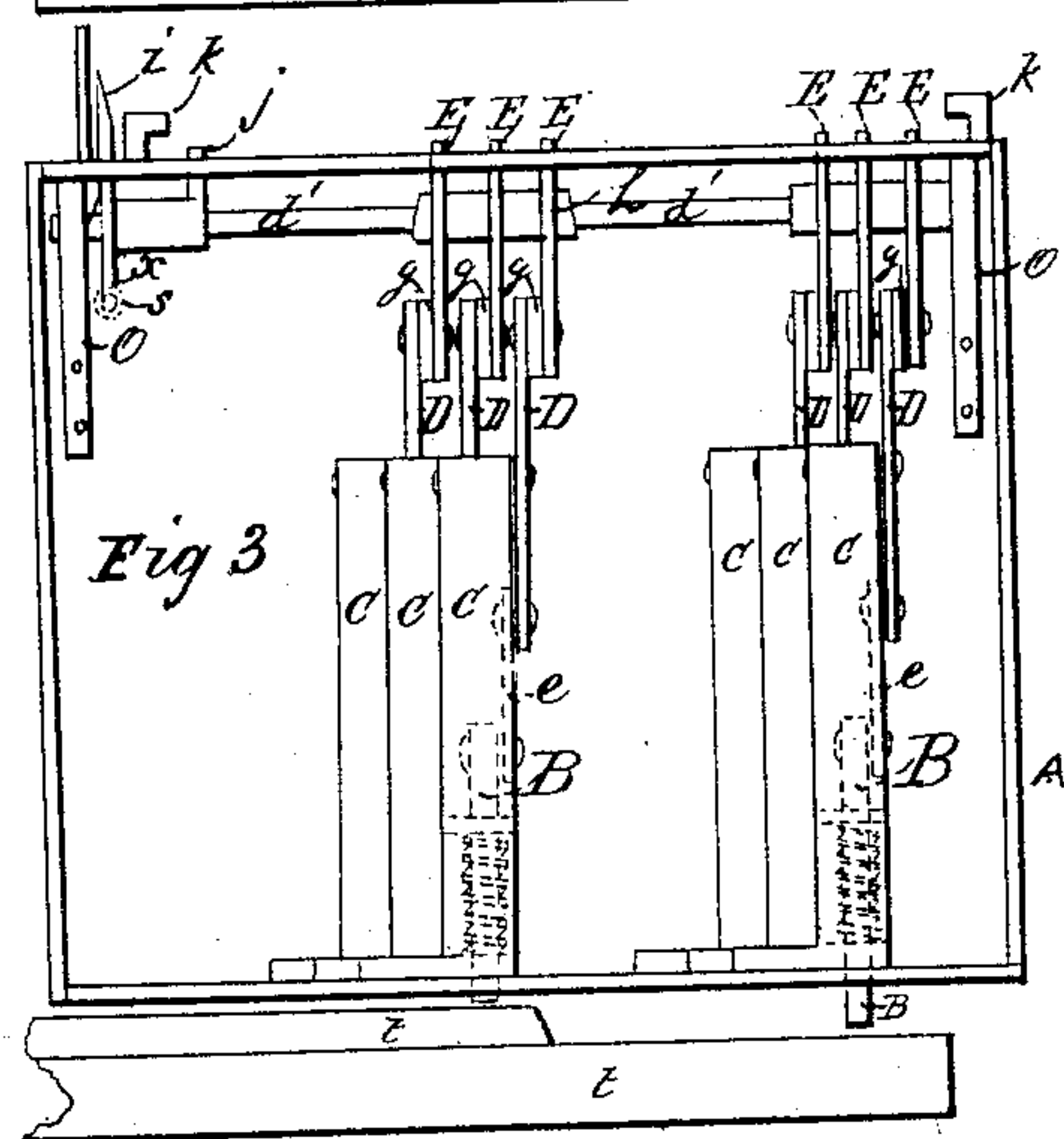
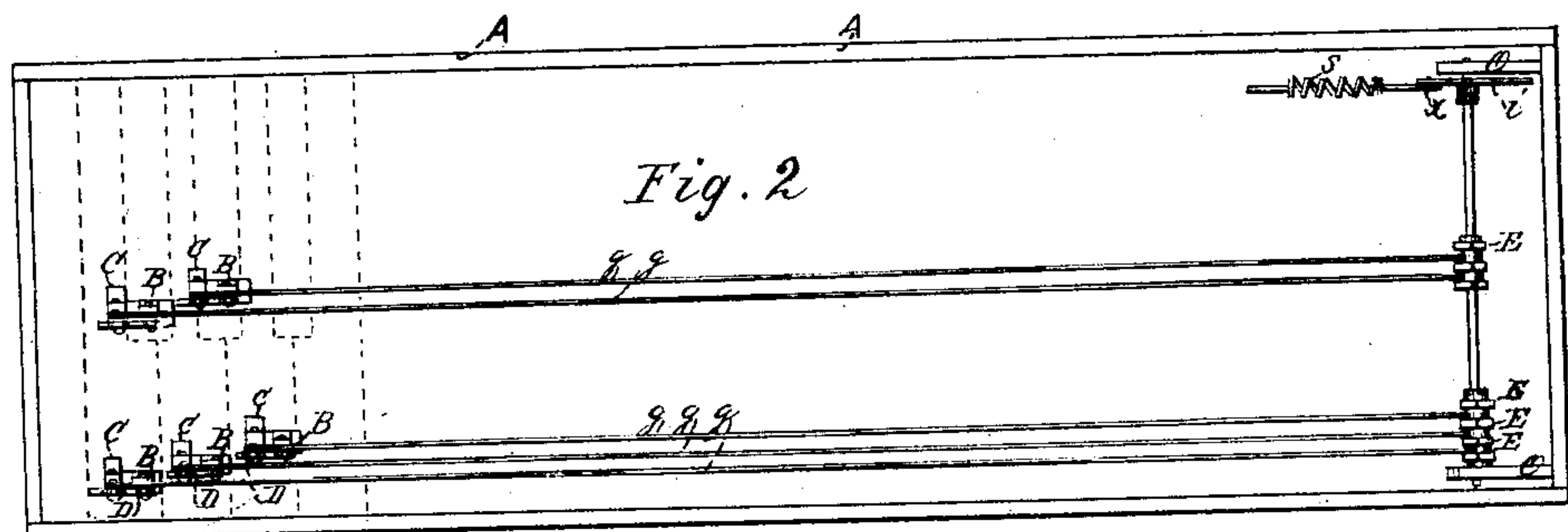
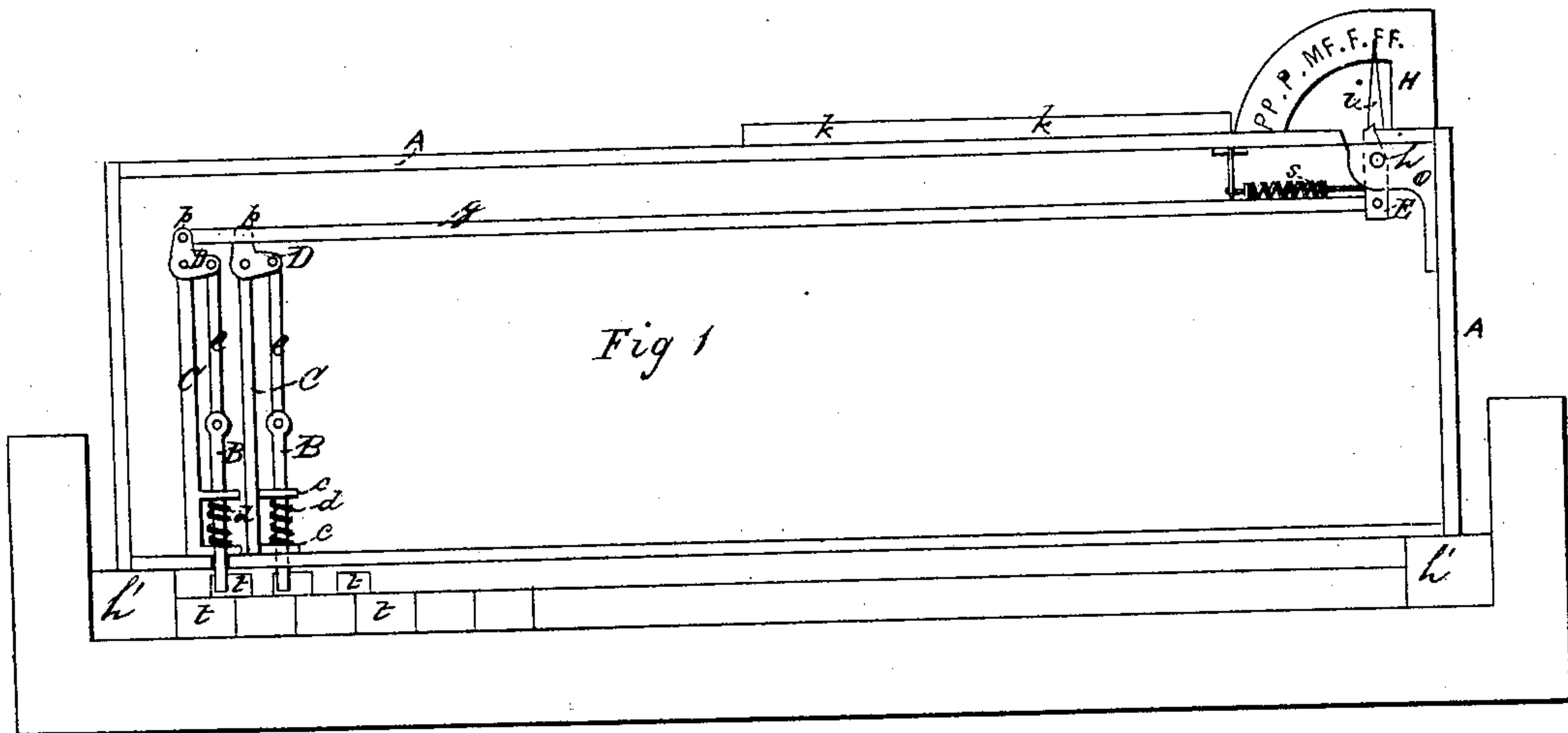
(No Model.)

G. R. ELLIOTT.

KEY BOARD ATTACHMENT FOR MUSICAL INSTRUMENTS.

No. 255,609.

Patented Mar. 28, 1882.



Witnesses:

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# UNITED STATES PATENT OFFICE,

GILBERT R. ELLIOTT, OF MONCTON, NEW BRUNSWICK, CANADA, ASSIGNOR  
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## KEY-BOARD ATTACHMENT FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 255,609, dated March 28, 1882.

Application filed May 6, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, GILBERT R. ELLIOTT, a subject of the Queen of Great Britain, residing at Moncton, in the county of Westmoreland and Province of New Brunswick, in the Dominion of Canada, have invented a new and useful Attachment for Musical Instruments, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a mechanical apparatus for operating the keys of pianos, organs, or other like instruments in connection with prepared plates or inflexible music-sheets, preferably metallic, by means of which any person, by simply turning a crank or by any suitable motor, may produce any musical tune upon either of said instruments, the tone, length, and expression of the notes being regulated with accuracy, as well as denoting by means of an indicator when the pedals of any piano or the stops and swells of any organ to which the same may be applied should be used.

It consists, first, of a series of upright or perpendicular pins or hammers working vertically in bearings attached to the base or bottom of the attachment, designed to be equal in number to the keys of the piano or other musical instrument to which the attachment is to be applied, and arranged in a position oblique or diagonal to the length of the key-board of said musical instrument. Between the bearings of said pins or hammers are placed springs or spirals, surrounding the pins or hammers for the purpose of keeping the said pins or hammers from coming in contact with the keys of the musical instrument until impelled by the operation of the prepared plate or music-sheet upon the pointed vertical levers and accompanying mechanism. The said pins or hammers are attached at their upper ends by means of pivoted connecting-rods to the ends of a series of knee-levers, corresponding in number to the said pins or hammers and the keys of said musical instrument, and working parallel with the key-board and at right angles with the keys of said musical instrument, and arranged obliquely, as hereinafter described. This series of knee-levers are fulcrumed or pivoted at their

several centers or at the bend of the knees to posts attached to the bottom or base of the attachment, said posts corresponding in number, as aforesaid. The opposite ends or arms of said knee-levers from those attached to the pins or hammers are connected by means of connecting-rods of varying lengths and corresponding in number, as aforesaid, (all working parallel and longitudinally with the key-board of the musical instrument,) to the lower ends of a series of vertical levers placed parallel with the keys and at right angles to the key-board of said musical instrument and corresponding in number to the aforesaid knee-levers, connecting-rods, pins or hammers, and keys. The said connecting rods are attached or pivoted to said last-mentioned series of vertical levers at their lower ends. The opposite or upper ends of said vertical levers are pointed, being designed to come in contact with the projections upon the prepared plate or music-sheet when operated. Said pointed vertical levers are pivoted and move upon a common center bar secured to the end of the box by knees or keepers, and work or move parallel with one another upon said bar or common center and at right angles with the keys of said musical instrument.

The above-described series of pins or hammers and knee-levers are divided into two sets working parallel with each other, and placed obliquely or diagonally across the key-board and at an angle with the plane of the keys, the first set operating upon the white or natural keys and the second set operating upon the black keys, or flats and sharps. The diagonal or oblique position of the series of pins or hammers and knee-levers to the length of the key-board forms an important element in the construction of this attachment, as it thereby admits of the connecting-rods between the knee-levers and the pointed vertical levers being placed in a position parallel and close to each other and parallel with the key-board and at right angles to said bar and the series of vertical pointed levers to be operated upon by the prepared plate or music-sheet, and the diagonal or oblique position of the same further admits of the series of pointed vertical le-



vers operated upon by the prepared plate or music-sheet being placed parallel with the keys of the instrument and at right angles to the key-board, thereby allowing all the keys of  
5 said musical instrument to be operated and controlled within a small space or compass.

The mechanism above described is preferably placed or constructed in a box forming the frame-work of the attachment, sufficiently  
10 long to cover the key-board of the musical instrument used, the ends resting upon the key-blocks of said instrument, and sufficiently wide to cover the key-board. The bottom of said box has apertures or holes to admit of the  
15 pins or hammers striking the keys of the musical instrument used. These holes or apertures must necessarily be in an oblique or diagonal position to the length of the key-board and correspond to the positions of the  
20 aforesaid pins or hammers. The pointed ends of the vertical levers acted upon by the prepared plate or music-sheet project through an aperture in the top of the box. It is designed to retain the box in its position over the key-  
25 board and upon the key-blocks at each end of the keys by its own gravity.

The prepared plate or inflexible music-sheet with projections upon its under surface is to be moved over the points of the vertical levers  
30 projecting above the top of the box by means of any suitable motor, said prepared plate or music-sheet to be moved in guides, so as to prevent lateral motion, in a direction parallel with the plane of the key-board and longi-  
35 tudinally with the musical instrument.

On the top of the box, and in a line at right angles with the series of pointed vertical levers operated upon by the prepared plate or music-sheet, is placed a metallic plate, forming the quadrant of a circle, having upon its  
40 face and near the outer edge letters corresponding to the musical characters indicating the modulations of musical tones. A hand or pointer is pivoted at the center of said quadrant and upon the common center bar or fulcrum  
45 of the aforesaid pointed vertical levers, and is operated upon or moved in one direction toward said letters by means of prepared projections upon the edge of the inflexible plate or music-  
50 sheet, coming in contact with a pin near the base or fulcrum of the hand or pointer, and is provided with a spring to hold the hand or pointer in its first position or move it in the opposite direction.

Figure 1 represents an elevation of the attachment with the front or one side of the box removed. Fig. 2 is a plan of the attachment with the top of the box removed, the dotted lines showing the position of the keys of the  
60 musical instrument. Fig. 3 is an end view with the end of the box removed. Fig. 4 is a bottom view and section of the prepared plate or inflexible music-sheet.

Similar letters refer to similar parts throughout the several views.

The box A, Fig. 1, constitutes the frame-

work of the machine, to which the different parts are secured.

B is one of the series of pins or hammers working in the bearings *c c*, and surrounded  
70 by the spiral *d*, connected by the connecting-rod *e* to the knee-lever D with movable joints, the latter being pivoted on the post C. The knee-lever D is pivoted at its opposite arm, *p*, to the connecting-rod *g*, which is pivoted to  
75 the lower end of one of the series of vertical pointed levers E. Said lever is fulcrumed at *h* and moves upon the bar *d'*, said bar being held in position by the keepers *o o*.

*h' h'* show the key-blocks of the musical in-  
80 strument.

B B B, Fig. 2, represent the series of pins or hammers placed diagonally across the key-board.

D D D show the oblique or diagonal posi-  
85 tion of the knee-levers.

C C C represent the posts.

*o o* show the knees or keepers holding the bar *d'*.

*g g g* are connecting-rods connecting the se-  
90 ries of levers D D D and E E E, and are parallel with one another and of varying lengths.

E E E are the series of pointed vertical levers operated upon by the prepared plate or music-sheet *m m*, Fig. 4, and moving upon the  
95 common center or bar *d'*.

H, Fig. 1, represents the indicator or quadrant, with letters corresponding to the musical characters representing the modulations of musical tones, with the pointer *i* and pin *j* mov-  
100 ing upon the bar *d'*.

*k k*, Fig. 3, show the guides which retain the prepared plate or music-sheet in its position.

*t t* are the keys of the musical instrument.

*r r* is the line of projections which operate  
105 the pin *j*.

*s* is the spring which moves the hand or pointer *i* in one direction.

The operation of the attachment is as follows: First place the attachment over the key-  
110 board of the piano, organ, or like musical instrument desired to be operated, the ends resting upon the key-blocks *h' h'*. The prepared plate or music-sheet *m m*, with projections *n n* downward, is now passed in the guides *k k* slowly  
115 over the series of pointed vertical levers E E E by means of any suitable motor.

The projections of varying forms and lengths upon the plate or music-sheet are arranged in such a manner as to represent the different  
120 notes of a tune and come in contact with and depress the different levers of the series at the proper time, thereby causing the connecting-rods *g g g* to move the knee-levers D D D, which latter, by means of the connecting-rods *e e e*,  
125 depress the pins or hammers B B B and compress the springs or spirals *d d* surrounding them, causing the said pins or hammers to operate or strike in regular succession the proper keys of said musical instrument, thus mechan-  
130 ically producing any desired musical tune. As soon as any of the projections have passed over



any of the levers of the series the spring or spiral *d*, acting immediately upon the pin or hammer B, knee-lever D, and connecting-rod *g*, returns the lever of the series E E E to its  
5 first position, and it is ready to be again acted upon by another projection upon the prepared plate or music-sheet. The varying projections and depressions *r r* on the edge of the prepared  
10 plate or music-sheet, coming in contact with the pin *j* at or near the fulcrum of the hand or pointer *i*, causes it to move in one direction toward the letters upon the quadrant a distance proportionate to the length of said projection, while the spring or spiral *s*, attached to  
15 the opposite end, *x*, of the lever, hand, or pointer *i*, causes it to move in the opposite direction whenever the depressions upon the line *r r* admit of it, thereby denoting when the pedals of the piano or stops and swells of the organ  
20 should be used.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a key-board attachment for a piano, organ, or like musical instrument, a series of

pins or hammers, B B B, with spirals *d d*, arranged in a position oblique or diagonal to the length of said key-board, substantially as and for the purpose described. 25

2. In a key-board attachment for a piano, organ, or like musical instrument, the series of posts C C C, to which the knee-levers and hammers are attached, arranged in a position oblique or diagonal to the length of said key-board, substantially as and for the purpose described. 30

3. In a key-board attachment for a piano, organ, or like musical instrument, the series of knee-levers D D D, fulcrumed on the posts C C C, arranged in a position oblique or diagonal to the length of said key-board, substantially as and for the purpose described. 35 40

In testimony that I claim the foregoing I have hereunto set my hand and seal this 3d day of May, A. D. 1881.

GILBERT R. ELLIOTT. [L. S.]

Witnesses:

JAMES R. CARRET,  
JESSE C. IVY.