E. Brown,

Piano Action,

No. 2,934. Patented Jan. 27, 1843.

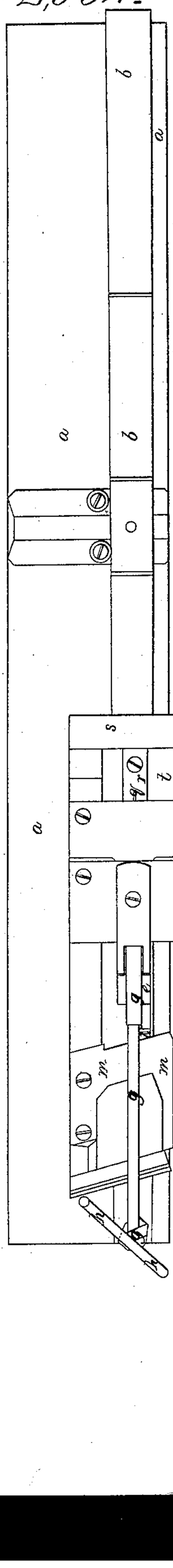

Fig. 2.

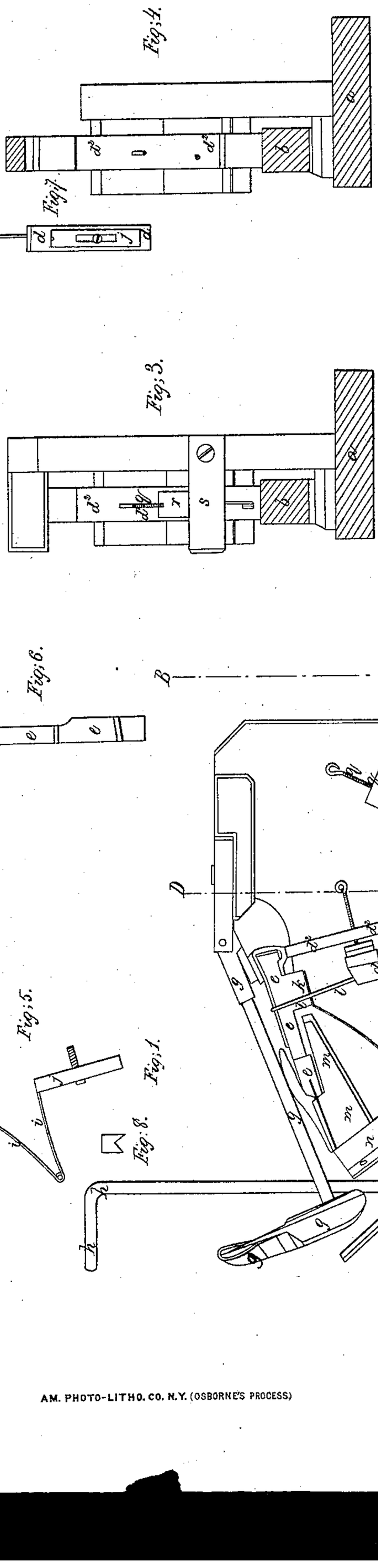

Fig. 3.

Fig. 4.

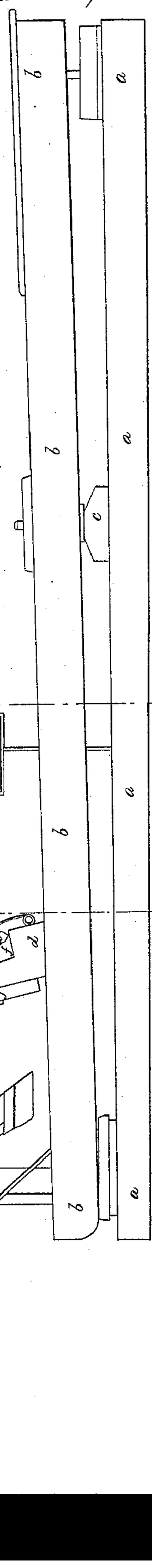

Fig. 6.

Fig. 5.

Fig. 1.

Fig. 8.

UNITED STATES PATENT OFFICE.

EDWIN BROWN, OF BOSTON, MASSACHUSETTS.

PIANOFORTE.

Specification of Letters Patent No. 2,934, dated January 27, 1843.

To all whom it may concern:

Be it known that I, EDWIN BROWN, of Boston, in the county of Suffolk and State of Massachusetts, pianoforte manufacturer, and a citizen of the United States, have invented an Improvement in the Action of Pianofortes, of which the following is a true, full, and exact description.

The object of my improvement is to obtain a more certain and perfect repetition of any note, to obtain a repetition by a slighter, and lighter touch of the key, and a more ready, easy and prompt action, and to prevent, what is termed the blocking of the hammer.

The action of a pianoforte consists of the mechanical apparatus whereby the stroke of the hammer is given upon the wire and the sound produced. A distinct action belongs to each key of the instrument.

In the annexed drawings *a*, *a*, *a*, *a*, Figure 1 represents a section of the platform or base, by which the action is in part supported. The key *b*, *b*, *b*, *b*, is a lever working upon its pivot at *c*, and putting the action in motion when pressed down by the finger. The jack, *d*, *d*, is framed into the key. When the key is pressed down by the finger it acts through the jack *d*, *d*, and its front d^2, d^2, upon the under hammer *e*, *e*, *e*, *e*. The front jack d^2, is a lever turning upon its pivot at *f*. The under hammer acts upon the upper hammer *g*, *g*, *g*, *g*, and causes it to strike the wire *h*, *h*, and produce the sound.

The action as above described is in common use. The method of applying the spring *i*, *i*, as described below, belongs to the improvement made by me. It has a coil at the left-hand part as seen in this drawing, for the purpose of increasing its elasticity, and being free and not supported and not attached to any part of the frame at that part. The block *j*, is fixed to the jack and moves with it and may be considered as part of the jack. One extremity of the spring is attached to the top of the block, and thus in effect attached and fixed to the jack, and accordingly when the jack is moved by the motion of the key the motion acts upon the spring, which rises and drops with the jack. The block *j*, is also one of my improvements. It is attached to the jack by a screw inserted through a vertical slot in the block, as is shown in Fig. 5, and accordingly on turning the screw so as to loosen the block, the block may be moved up or down and adjusted and fixed in any position desired by again screwing it down. The spring may be attached directly to the key or the jack, and this regulating block thus dispensed with, but from experiment of the different modes of fixing the spring I think that of fixing it to the regulating block decidedly preferable. A back view of this regulating block *j*, is given in Fig. 7. The regulating block may be attached to some fixture or standard upon, or projection standing up from the key, and the spring attached to the block thus adjusted, and this will be the same in effect as attaching it to the jack. When the regulating block or some equivalent contrivance for slackening and stiffening the spring and regulating its tension is not used, then the spring may be attached directly to the jack, or in front of or behind the jack to the key or to some fixture, standard, or projection from the jack or the key, or the spring may be secured at or through its coil, by a pivot to a block suitable for the purpose, and such block be screwed or attached to the under side of the under hammer rail or frame *m*, *m*, and when the key is pressed down the end of one branch of the spring be made to traverse in the grooved block *k*, as described below, and the end of the other branch to traverse in like manner in a groove in the upper end of the regulating block *j*. This will as has been ascertained by experiment, produce the same effect as attaching the spring to the jack. The grooves must of course be in the direction of the branch of the spring the end of which traverses in them respectively. It is evidently necessary that the spring should in this case, play freely at the pivot. Attached to the under hammer *e*, *e*, *e*, *e*, is the block *k*, which may be considered to be a part of that hammer; this is also a part of my improvement. On the under side of this block *k*, is a beveled groove extending quite across the block in the direction of the key, that is, in the direction from front to rear of the pianoforte, which groove is lined or faced with soft leather. Fig. 8 represents a transverse section of this block *k*, exhibiting the form of the groove. The upper extremity of the spring *i*, *i*, lies in the angle of the groove, so that when by the motion of the key the

is raised or lowered by the motion of the key, slides to and fro in the angle of this groove. The tendency of the spring when the jack is raised, obviously is to raise the lower hammer *e*, *e*, *e*, *e*, as its upper extremity bears gently upward against the lever of that hammer, but it is not the peculiar function of this spring to raise the hammer and give the stroke upon the wire. this being done mainly by the action of the front of the jack d^2, upon the lower hammer *e*, *e*, *e*, *e*, and this upon the upper hammer *g*, *g*, *g*, *g* in the manner heretofore in common use.

The function of the spring is to coöperate in raising the hammer, and to check and lighten their descent, whereby the performer is enabled to give a delicate repetition of the stroke at the elevation of the fingered part of the key, at half of its full sweep or vibration. Another function of the spring is to return the key to its proper resting position, and accordingly by the use of the spring, the use of a weight for this purpose is dispensed with, or a lighter weight used. The spring which I have used in my pianos is of number 10 steel wire, but the size and material of the wire may be varied and the object of the improvement be still successfully effected. The tension and force of the spring is regulated by adjusting the block *j*, at a higher or lower position on the jack. The wire or rod *l*, *l*, is also as applied by me, a part of my improvement. It is inserted into, and projects from, and is fixed to the jack and accordingly moves with the jack. It terminates at the top in the form of a right-angled hook or elbow, as represented in Fig. 7. The return part or arm projects horizontally across the lever of the lower hammer *e*, *e*, *e*, *e*, so that when the key of the piano is at rest, this horizontal arm or projection is in slight contact with the soft leather coating of the upper surface of that lever, and accordingly when the key of the instrument is in its resting position, the lower hammer must be in its resting position upon the top of the front jack d^2. As the jack is raised this hook *l*, *l*, is raised from off the lever of the lower hammer. The use of this hook is to secure the lower hammer to be in its proper resting position, when the key of the instrument comes to its resting position. The side of the lever of the lower hammer, *e*, *e*, *e*, *e*, is cut away so as to make space for this hook *l*, *l*, to play backward and forward when the action of the instrument is put in motion, see Fig. 6. This also is part of my improvement.

The changing of the form of the frame, a section of which is represented in drawings *m*, *m*, *n*, *n*, Fig. 1, is also a part of my improvement, the common form of this part of the frame being quadrilateral with opposite sides about parallel to each other. The upper part of the rail heretofore in use corresponds in position with the upper surface of mine, marked *m*, *m*, in Fig. 1, but the common rail is much thicker vertically, the lower part being removed in my improvement so as to make room for the spring. The posterior part *n*, *n*, is attached to the other *m*, *m*, for the purpose of strengthening it and rendering it a firm and sufficient support for that part of the action which is connected with that part of the frame, the part *n*, *n*, is unscrewed and taken off in order to come at and regulate the spring.

Another part of my improvement is the wire *o*, *o*, Fig. 1, and the apparatus *p*, *q*, *r* and *t*. The wire is screwed or otherwise attached and fixed to the front jack d^2. The use of it is to coöperate in throwing off the top of the front jack d^2, from the under hammer, and disengaging it from that hammer when the stroke is given. Such disengagement is requisite in playing upon the instrument, and is intended always to take place in instruments in common use. This part of my improvement is intended to secure it more certainly.

In the same drawing Fig. 1, *s*, represents a section of the front rail which extends from one end to the other of the instrument, on which a part of the action is supported, *t*, is a beveled projection inward, that is, backward from that front rail, and may be of the same piece of wood, or a piece glued, or otherwise attached and fixed to that front rail, the upper surface of which projecting ledge is beveling, or oblique to the back of the rail, making the angle with it shown by the position of the block *r*, which is attached and fixed to such ledge. A screw *q*, works through the block *r*, to the lower end of which screw is attached and fixed a cushion *p*, faced with soft leather, which cushion is regulated by the screw, and may be projected downward or drawn upward by turning the screw. The curved end of the wire *o*, *o*, as the jack *d*, *d*, is raised, comes in slight contact with the face of the cushion *p*, and thus coöperates to throw forward the top of the front jack d^2 and disengage it from the under hammer.

I claim as my invention, and ask a patent for—

1. The use of the spring *i*, *i*, attached by means of a regulating block to the jack or the key, or, attached directly to the jack or key, or to a fixture or standard upon, or projection from, the jack or key, or to the rail or frame as above described, and for the purpose above described.

2. The block *j* constructed and adapted, as above described, for the purpose above described.

3. The grooved block *k*, constructed and

jack, and with it, the spring is moved. The upper extremity of the spring, as the spring adapted as above described, for the purpose above described.

4. The wire or rod *l*, *l*, constructed and adapted as above described, for the purpose above described.

5. The combined use of the spring *i*, *i*, and the block *j*, and the grooved block *k*, and the wire or rod *l*, *l*, constructed and adapted as above described for the purpose above described.

6. The improved form and construction of the frame of the piano-forte, as above described, and as shown in the annexed drawings, Fig. 1, *m*, *m*, *n*, *n*.

7. The wire *o*, *o*, and apparatus *p*, *q*, *r*, and *t*, constructed and adapted as above described and for the purpose above described.

In witness whereof I hereto set my hand this nineteenth day of January in the year of our Lord one thousand eight hundred and forty-two.

EDWIN BROWN.

Witnesses:
RICH. ROBINS,
WILLARD PHILLIPS.