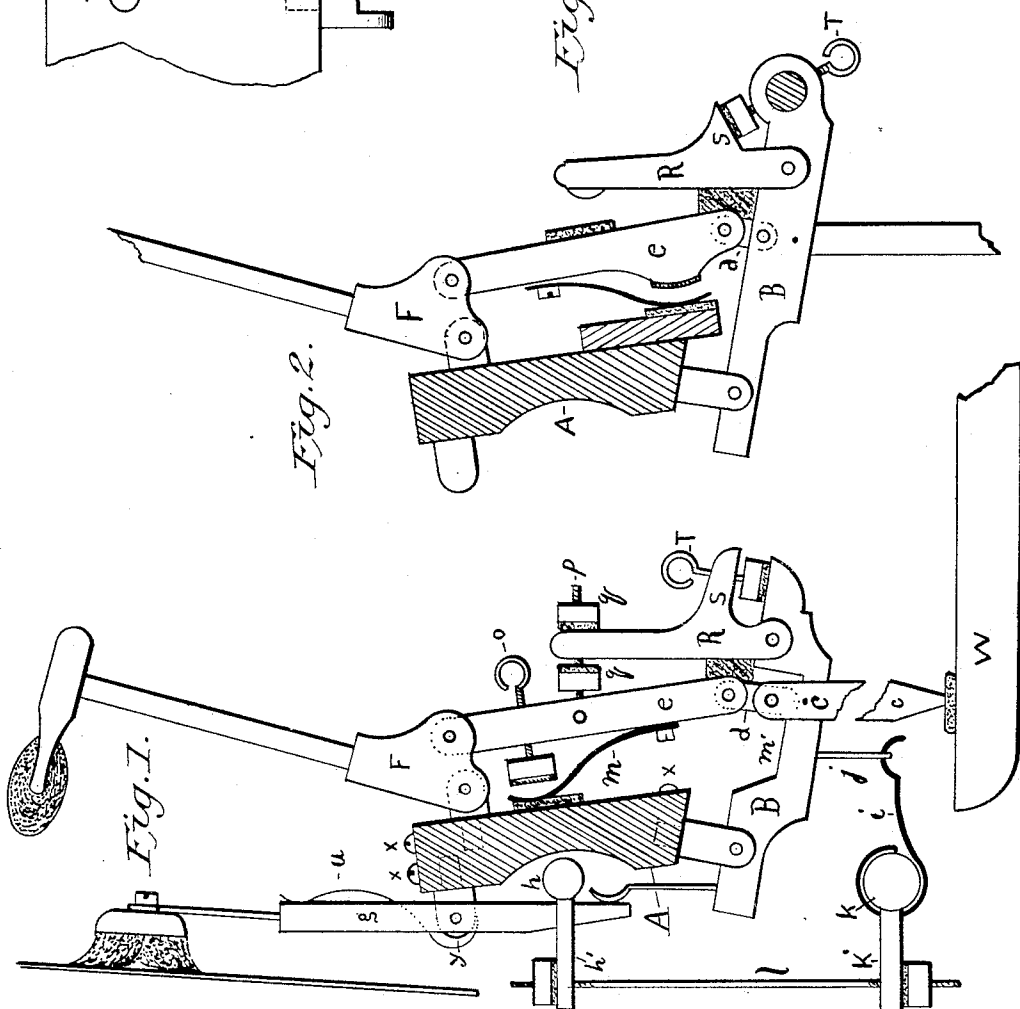
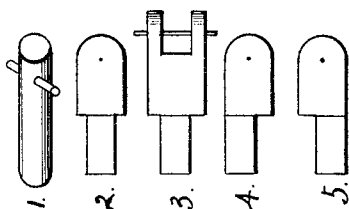
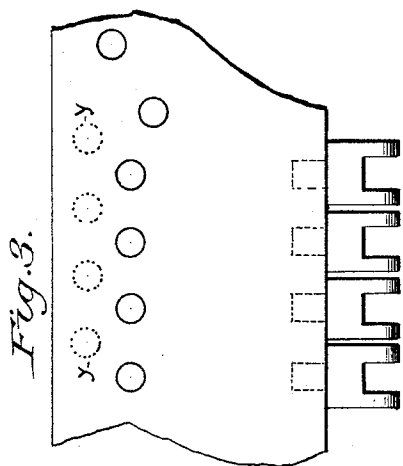


(No Model.)

S. R. PERRY.
PIANO ACTION.

No. 498,814.

Patented June 6, 1893.



WITNESSES.
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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 498,814, dated June 6, 1893.

Application filed June 8, 1892. Serial No. 435,980. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL R. PERRY, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Pianoforte-Actions; and I do hereby declare that the following is a full, clear, and exact description of the same, which will enable any one skilled in the art to which it appertains to make and use the same.

The object of my invention is to produce the best repetition of stroke, cheapen the cost of construction, and place the string damper mechanism under the immediate control of the performer by regulating and equalizing the weight or pressure of the keys, when the string dampers are held away from the strings, which is essentially a new feature of the invention.

Another feature of this invention, is the extension of the pitman rod or abstract above the actuating lever and connecting the short and long links used in this mechanism, also the application of a spring to the long link in such manner that the movements of said spring are limited by a stop either placed through the said long link or formed upon its surface. Also arranging and securing the studs into the action rail for the string damper levers, actuating levers, and hammer butts, and a regulating device between the long link and pivoted post and the regulating device between the pivoted post R and the lever B; also a spring attached to the short links all of which are new features of this invention. In connection with this object, and to fully explain it I have the accompanying illustrations Figures 1, 2, 3 and 4 as a part of this specification.

In Fig. 1 we have the action rail A to which is secured the actuating lever or arm B, by means of a stud having a pivoted end which is glued into the action rail, and secured also by means of a set screw if necessary. To this lever B, is attached the pitman rod or abstract C coming up from the piano keys W and extending above lever B, and to which a short link *d* is pivoted. This short link in turn is connected to the lower end of the long link *e*, which in turn is pivoted to the ham-

mer butt F. By connecting the pitman rod C direct to the short link *d*, the centers of the links move up in a more directly perpendicular line, and are not so much affected by curvature of the lever B in its movement, as they would be were the short link connected directly to the lever B.

On the rear of the hammer butt, secured by another stud, is the string damper *g* operated in the usual manner by means of the spoon post fastened in actuating lever B. From the damper rod *h*, extends an arm *h'* and from this arm it is connected to the foot pedal by means of a pitman in the usual way (not shown).

Beneath the rear end of lever B and extending the full length of the action, is secured a round rod K carrying springs *i* which springs are attached to lever B one for each hammer space, held to B by means of loops *j*. From this spring rod K is extended arm *k'* and the arms *k'* and *h'* are connected by means of a rod *l* for the purpose of regulating the tension of the springs on rod *k*, and the distance between the arms. It will now be apparent that in operating the dampers by any pedal appliance and movement from below, the rod *l* will act upon the spring rod K, which revolves upon its centers and must increase the tension of the springs *i* when the arms *k'* and *h'* are moved upward which force is thrown upon the pitman and transferred to the keys by the medium of lever B.

The weight on the keys lost by removing the damper lever *g* and spring *u* from the piano strings is by the same movement of the pedal regained by the extra tension exerted by spring *i* thus leaving the keys uniform in weight to the touch. The spring *i* may be connected to the pitman rod C direct if desired. The result would be the same.

Upon the long link *e* I place a spring *m* which is intended to act upon the links *e* and *d* in holding them into position when the action is at rest. The spring *m* does this in connection with the small coil spring *m'* attached to the extended part of the short link, (shown by dotted lines,) and secured to the actuating lever B.

Through the long link *e* I put a regulating device or buffer O which at the proper time

will come in contact with the end of the spring *m*, and thereby act as a complete check in holding the hammer immediately after the stroke is made, and during the time the key is held down. The same spring is shown in Fig. 2 in an inverted position and bearing on the lower part of rail A and is free to act as a spring until the projection upon link *e* bears against it and rail A when it becomes the back check to the hammer stroke, identical with spring *m* and buffer O in long link *e* shown on Fig. 1. This also shows that the spring *m* has a two fold function as applied, to wit: acting on long link and forming a back check to hammer stroke, and is in this respect different from those shown on Patent No. 453,938, granted me June 9, 1891.

From the long link *e* Fig. 1 extends a regulating device composed of a threaded wire P upon which are placed two buffers *q q* which in conjunction with a pivoted post R and the buffer extending through arm S the said post is held rigidly in such position as may be necessary for the purpose of operating the links *e* and *d*, the said regulating being for the purpose of ascertaining the right position of the post R to a nicety. In Fig. 2 it is shown that the pivoted post R is regulated by the screw and buffer being placed into the end of actuating lever B and pressing against the extended portion S.

The operation of this mechanism will be as follows: When the actuating lever B is forced up by the key, in playing, the said lever passes in a curved line from the pivoted stud, and at the point of the alignment of the centers of the long link and short link and pitman rod, extending up from the keys the post R comes in contact with the buffer attached to long link *e* and forces it quickly toward the action rail, when the hammer is within a short distance of the piano string, and, at the instant after striking, the buffer O in long link *e* comes in contact with the spring *m* pressing it against the action rail A, and holding thereby the stroke in check, or the rebounding hammer, until such time as the pressure of the key is removed.

The action rail, Fig. 3 into which the solid studs are placed for holding hammer butts F, damper levers *g*, and actuating levers B, is made of a solid piece. These studs may be glued solidly into this rail or secured by screws, or both. The borings are made to suit the distance of piano keys, width, &c. These holes are placed in line for hammers or actuating levers or dampers, Y, shown by dotted circles on the opposite side of rail A. They may be alternated to retain strength of material if desired as shown by *z z* Fig. 3. The studs may be rounded throughout their length as shown by No. 1 Fig. 4 but are made preferably with a shoulder as in No. 2, 3, 4, and 5 the wider part giving more strength and the shoulder regulating the depth to which the round or dowel part may be driven into the holes. When used in alternation the studs

must be shouldered as is shown by Fig. 4 No. 4 and 5 while No. 3 Fig. 4 may be used for the actuating levers and is a stud having both shoulders and flanges.

Having thus fully described my improvement, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a piano action the long link provided with a spring and a stop or projection so arranged as to limit the action of said spring against the action rail substantially as specified.

2. In a piano action the long link carrying an adjusting device, as O, and a spring, in combination with the action rail for the purpose specified.

3. In a piano action having two links the short link connected to the pitman rod, substantially as and for the purpose described.

4. In a piano action the pitman rod pivoted to the actuating lever and in continuation to the links and the hammer butt, substantially as set forth.

5. In a piano action the short link having an extended part below its lower pivot and operated upon by a spring attached to the actuating lever substantially as specified.

6. In a piano action the combination of the pitman rod with the short link extended below its lower pivot and connected to a spring, substantially as specified.

7. In a piano action a spring rod extending below the actuating levers and provided with springs in combination with the pitman rod and the key substantially as set forth.

8. In a piano action the revolving spring rod carrying springs, said springs attached to the actuating lever as specified.

9. In a piano action the arm of the damper rod adjustably connected to the arm of the revolving spring rod, the springs, the loops, the actuating levers, and damper levers all arranged and combined as specified.

10. In a piano action the post pivoted to the actuating lever, in combination with a regulating screw and buffer for the purpose specified.

11. In a piano action having two links, the long link provided with a threaded wire, as *p*, and regulating buttons, as *q q*, in combination with a post for the purpose named.

12. The piano action studs as shown formed with a shoulder in the manner and for the purpose specified.

13. The action rail A provided with suitable borings and studs with shoulders and screws X in combination for the purposes named.

14. In a piano action the combination of the key, the pitman rod extending to and attached to the short link, the long link, the hammer butt, and damper lever, and the action rail substantially as specified.

15. In a piano action the combination of the key, the pitman rod extending to and attached to the short link, the long link, the

hammer butt and damper lever, the action rail, with the pivoted post and the regulating screw and buffer, substantially as described.

16. In a piano action the combination of the key, the pitman rod, the actuating lever, the links, the hammer butt, the action rail, the damper lever and pivoted post, with the revolving rod and its springs substantially as specified.

17. In a piano action the combination of the key, the pitman rod, the actuating lever, the links, a spring as *m*, operating between the action rail and the long link with a stop or projection limiting its action, the hammer butt, action rail and damper lever, substantially as described.

18. In a piano action the combination of the key, the pitman rod, the actuating lever, the links, the hammer butt, the action rail and damper lever, with the spring rail and springs substantially as set forth.

19. In a piano action the combination of the key, the pitman rod, the actuating lever, the long link provided with a spring, as *m*, the short link, the hammer butt, the action rail, and damper lever substantially as specified.

20. In a piano action the combination of the key, the pitman rod, the actuating lever, the links, the long link provided with a screw, as *p*, and buttons, as *q q*, the hammer butt, the action rail, the damper lever and a post, as *R*, substantially as set forth.

21. In a piano action the combination of the key, the pitman rod, the actuating lever, the links, the hammer butt, the action rail and damper lever, with the pivoted post and

an adjusting device operating between the actuating lever and the pivoted post, substantially as set forth.

22. The combination of the key *W*, rod *C*, lever *B*, links *d* and *e*, post *R*, hammer *F*, damper lever *g*, with the rail *A* supplied with the studs as described and for the purposes named.

23. The combination of lever *B*, extended link *d*, and spring *m'* as and for the purpose specified.

24. The long link *e* provided with a spring *m* and a stop or projection limiting its action toward the action rail, in combination with the post *R* as and for the purpose described.

25. The spring rod *K* provided with springs *i* in combination with the keys, the post *R* and the hammer and damper actuating mechanism for the purpose described.

26. The revolving damper rod *h*, having arm *h'*, and connected to the arm *k'* of the revolving spring rod *K* substantially as and for the purpose specified.

27. In a piano action the combination of the key, the links, the long link provided with a spring and a stop or projection limiting its action, the hammer butt, action rail, and damper lever.

28. In a piano action the combination of the key, the actuating lever, the links, the hammer butt, the action rail and damper lever, with a pivoted post and an adjusting device operating between the actuating lever and the pivoted post.

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Witnesses:

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