

(No Model.)

3 Sheets—Sheet 1.

A. T. ROUSSEAU.
PIANOFORTE ACTION.

No. 532,912.

Patented Jan. 22, 1895.

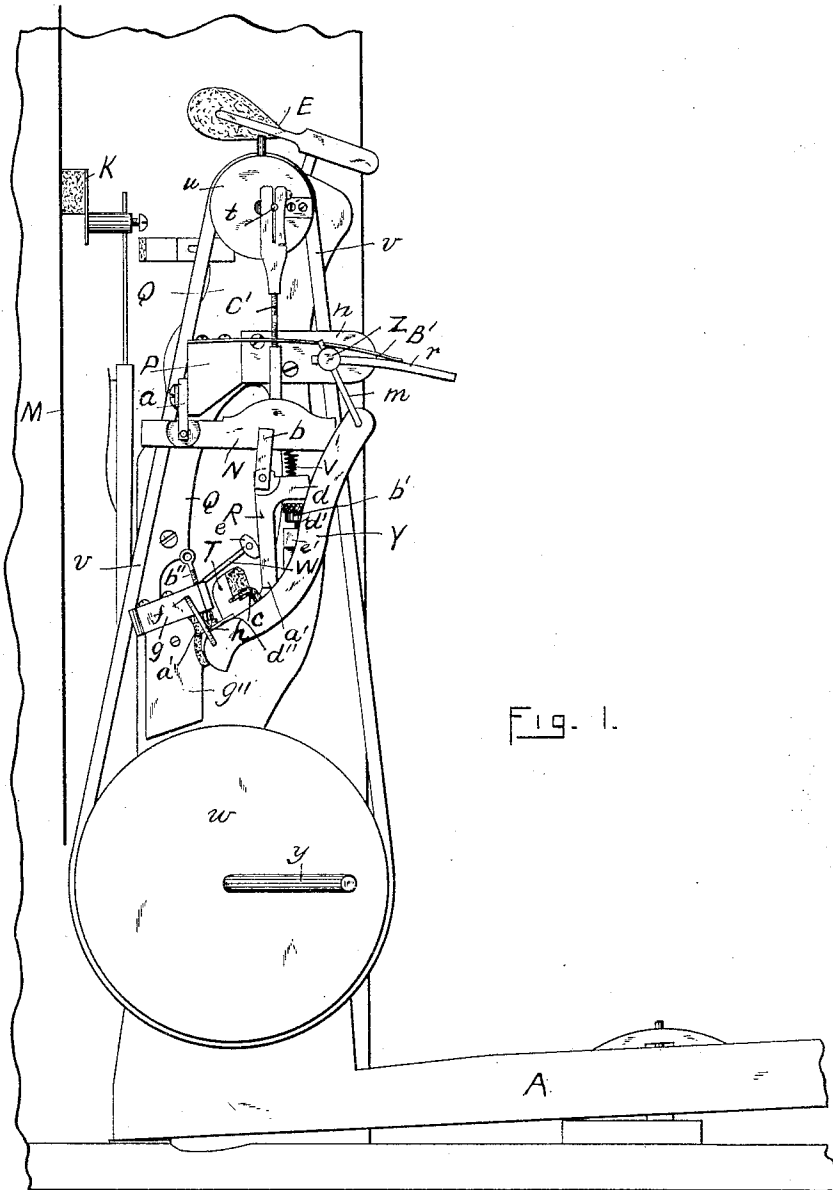


Fig. 1.

WITNESSES
Barrie E. Nichols
H. B. Menzies

INVENTOR
Auguste T. Rousseau
Per Edwin M. Brown.

ATTY

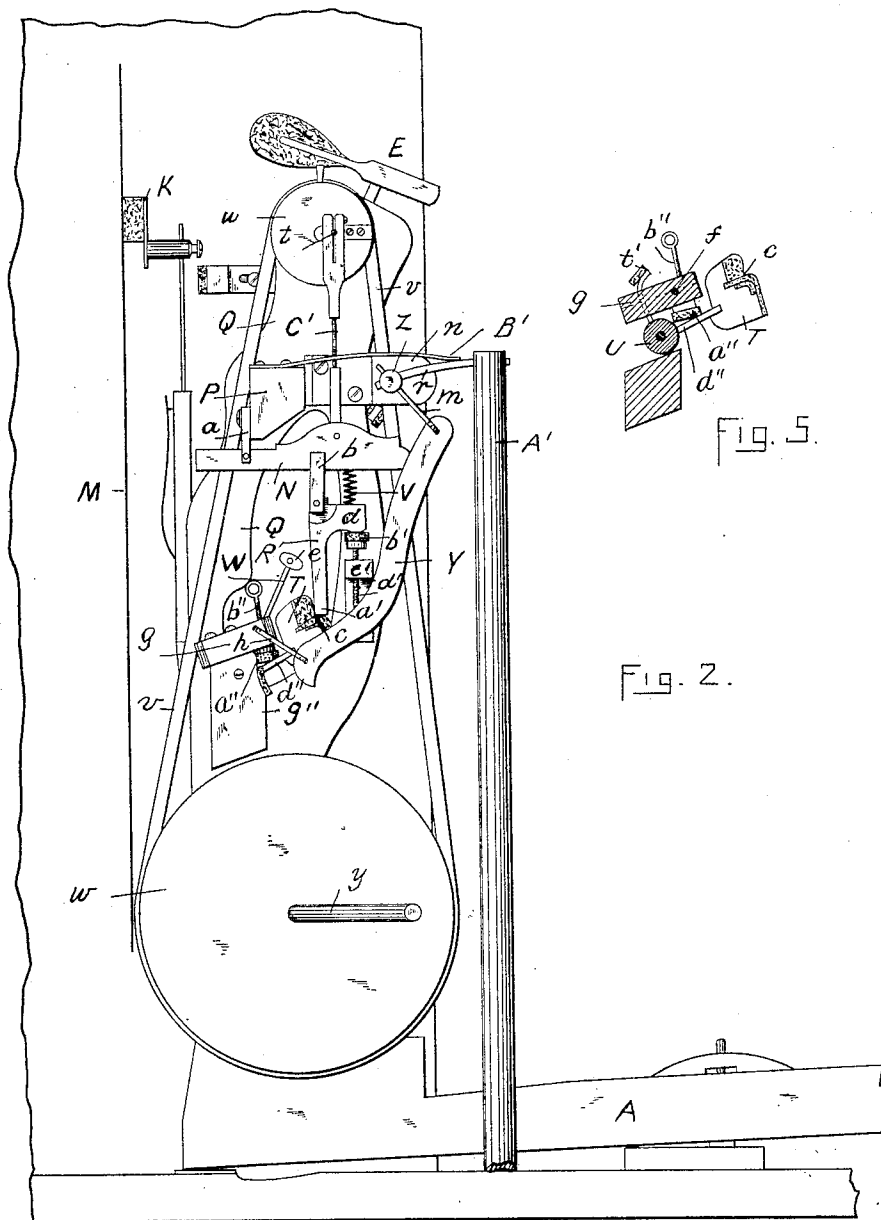
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WITNESSES
 Carrie E. Nichols.
 A. B. Wentworth

INVENTOR
Augusto J. Roussier
Per Edwin W. Brown.
ATTY

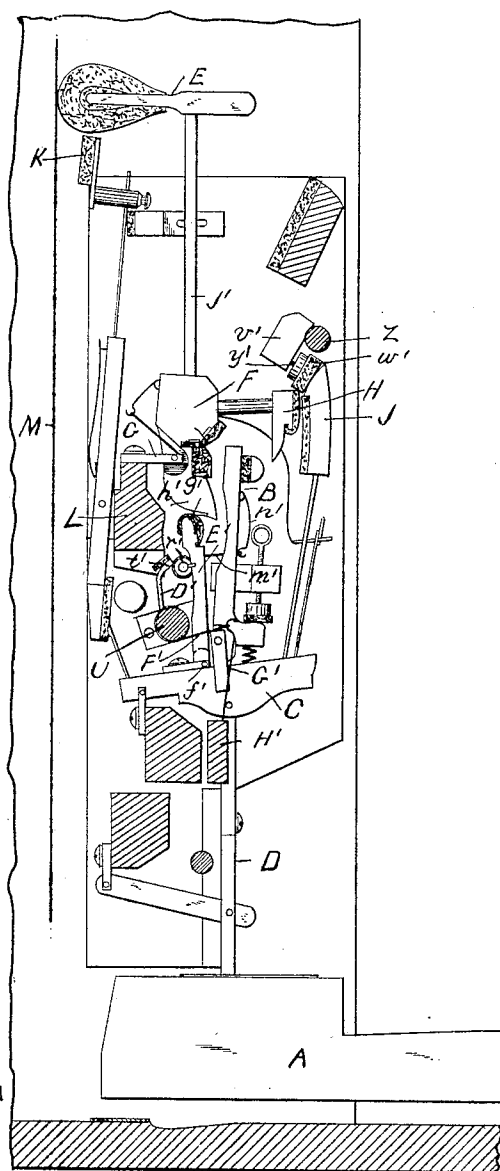
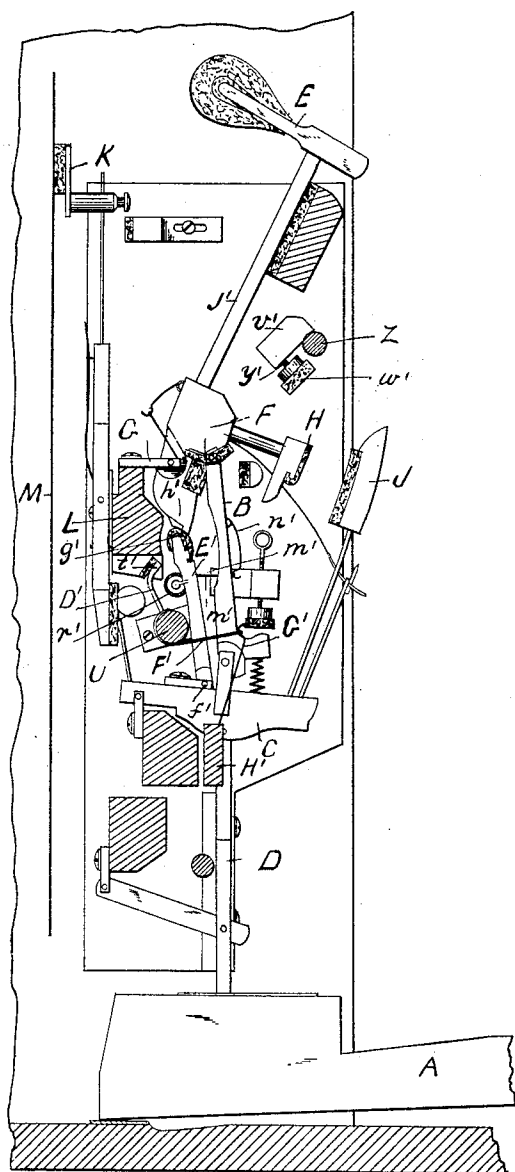
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WITNESSES
Barrie E. Nichols,
P. J. Wentworth

INVENTOR
Auguste J. Rousseau
Per Edwin W. Brown.
ATTY

UNITED STATES PATENT OFFICE.

AUGUSTE T. ROUSSEAU, OF CAMBRIDGE, MASSACHUSETTS.

PIANOFORTE-ACTION.

SPECIFICATION forming part of Letters Patent No. 532,912, dated January 22, 1895.

Application filed July 19, 1892. Renewed December 12, 1894. Serial No. 531,616. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTE T. ROUSSEAU, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Pianoforte-Actions, of which the following is a full, clear, and exact description.

This invention relates to that class of improvements in piano forte actions in which mechanism is constructed and arranged for operation upon the hammer in such manner that a rapid succession of blows of the hammer upon the string will be obtained independent of the key, and the invention consists in combination with a piano forte action of mechanism substantially as described, constructed and arranged for operation upon the hammer all substantially as hereinafter fully described.

In the accompanying sheets of drawings is illustrated an upright piano forte action having this invention applied thereto, Figure 1, being a view in side elevation of the parts of the present invention with the action; Fig. 2, a similar view to Fig. 1, with the parts in different positions; Figs. 3 and 4, side elevations of the piano action more particularly in two different positions, with parts of the present invention. Fig. 5, is a detail vertical section to be hereinafter referred to.

In the drawings A represents the key; B, the jack pivoted to the lever C, connected to the rod D for operation by the key. E is the hammer; F, the hammer butt, pivoted to the flange G; H, the butt heel; J, the back catch secured to jack lever C; K, the damper pivoted to the rail L, and M the string all as usual in upright piano actions and needing no more particular description herein and shown more particularly in Figs. 3 and 4.

N is a lever pivoted to a flange *a*, of a block P secured to the outside of the upright or support Q, of the action frame, and pivoted to a flange *b* of the lever N is a downwardly projecting jack R which is arranged at certain times as will hereinafter be described, to strike the shoulder *c* of a block T similar to the hammer butt F secured to a horizontal rock shaft U which is pivoted in the upright Q and is of a length to extend over and across the whole piano action, and by its other end is pivoted to the other upright of the action.

V is a spiral spring between the arm *d* of the jack R and the lever N which acts to hold the jack to its engagement with the shoulder *c* of the block T when not otherwise acted upon.

W is an arm formed of a wire having a block *e* secured to its end, the wire being so bent that a horizontal portion *f* extends through a bearing in a support *g* of a block *g'* secured to the upright Q and from thence it is bent downward as at *h* and engages with a socket in the lower end of a bar Y which at its upper end is connected by a socket to an arm *m* of a horizontal rock shaft Z turning in a bearing in a support *n*, of the upright and extending along the width of the action parallel with the other rock shaft U, and turning in a bearing in the other upright. This rock shaft Z has a projecting arm *r*, with which engages a vertical rod A' which rod is connected to a suitable pedal for operation thereof. Adapted to bear on the upper side of the arm *r*, is a flat spring B' secured to the block P which serves to hold it down and return it thereto when free. As shown in Fig. 1 these parts are in their normal positions being held in such position by the spring B' bearing on the rock shaft arm Z and in such position the arm W is swung forward on its portion *f* to press by its block *e* against the jack R to hold it clear and free from engagement with the hammer block T.

The arm *r* is raised by pushing up the vertical rod A' which by its bar Y connection with the rock shaft U swings the rock shaft in its bearing, moving its arm W and head *e* back from its bearing on the jack R allowing its spring V to move it to its seat on the escape block T into position for it to operate thereon as shown in Fig. 2.

The lever N is connected by a pitman rod C' to a crank arm *t* of a small pulley *u* adapted to turn in bearings in the upright Q which pulley is connected by a belt *v* to a larger pulley *w* turning in a bearing in the upright below and having a crank handle *y* for operation thereof.

Secured to the rock shaft U by one end is a string F' which extends partially around the shaft and then forward and is connected by its other end to the free end of a spring G' secured to a block H' in turn secured to

the inner side of the upright Q which spring serves to hold the rock shaft U, in its normal position and to return it thereto when moved therefrom. With these parts in the position shown in Fig. 2, turning the lower pulley *w* by its crank the upper pulley *u* is revolved which by its crank and pitman rod *C'* alternately raises and lowers the jack R and causes its free end *a'* to successively strike the shoulder *c* of the block T and pressing it down causes its rock shaft U to turn in its seat correspondingly. As the jack moves down its angular arm *d* abuts against a button *b'* of a screw wire *d'* screwing through a block *e'* of the upright, and causes the free end of the jack to escape or relieve itself from contact with the block T allowing the spring *G'* to return it to its normal position for another operation of the same by the jack as it is pressed down again by the turning of the pulley *u*. Thus at each downward movement of the jack R the shaft U is partially turned.

Pivoted by its lower end at *f'* to the action jack lever C back of the action jack and in the same vertical plane is a vertical arm *E'* its upper end *g'* being just back of a downward extension *h'* of the hammer butt F shown more particularly in Figs. 3 and 4. A wire or rod *m'* secured to its front side, extends horizontally through a vertical opening in the jack B and is connected to the free end of a spring *n'* of said jack which spring serves to hold the vertical arm *E'* close against the extension *h'* of the hammer butt F. On the back side of this vertical arm *E'* is a projection *r'* against which is adapted to strike a head or the end *t'* of an arm *D'* secured to the rock shaft U as shown in Figs. 3 and 4.

Connected to the rock shaft Z is a rail *v'* having a small block or button *w'* on its front side in the same vertical plane as the hammer stem *J'* and back catch J this block being secured to a wire *y'* screwing into the under side of the rail *v'*.

The operation of the action is as follows: When desirous of repeating a note struck by a key, such key is held down and then the arm *r* of rock shaft Z is raised, by pushing up the vertical rod A' which moves the parts of the action from the positions shown in Fig. 1, into the positions shown in Fig. 2, in which latter positions as stated before the jack R is in engagement with the escape block T of rock shaft U. Turning the pulley *w* by its crank *y*, the upper pulley *u* is turned causing the jack R to be moved down and up, and as many times as the pulley is revolved and as quickly as its speed. As it moves down, by bearing against the escape block T it pushes it down correspondingly moving the rock shaft U a certain distance until relieved therefrom by its arm *d* abutting against the button *b'* similar to the action jack B on its hammer butt F which as the jack is relieved by the action of spring V returns to its normal position, shown in Fig.

1, the spring *G'* by its cord connection *F'* with the rock shaft U also returning it and its escape block T to their normal positions for another downward movement of the jack as before, and so on as long as the pulley is turned. As the rock shaft Z is turned by the raising of its arm *r* it swings its button block *w'* against the back catch J and pushes it away from the hammer butt heel H, leaving the hammer free to be moved independently thereof. Holding the key down, it, by its jack, holds the hammer E up pretty near to the string, M in position for it to freely and easily strike the string when operated by the other parts, and also raises the operating arm *E'* into position to act upon the hammer butt. As the rock shaft U is turned, its arm *D'* strikes against the vertical arm *E'* and forcing it against the extension *h'* of the hammer butt F, swings it on its pivot and causes the hammer E to strike the string, making a sound, and then as the escape block T is released from the jack R the two arms *D'* *E'* return to their normal positions, to again act upon the hammer butt, as before, and so on as many times and as quickly as the jack R is depressed, thus causing a repetition of the blows of the hammer and producing the desired succession of tones. Letting down the arm *r* and releasing the key the parts all return to their normal positions. Thus with a key pressed and held down, in each revolution of the upper pulley the independent jack R strikes the block T, swings the rock shaft U and by its arm *D'* strikes the vertical arm *E'* against the hammer butt F causing its hammer to strike the string, when all parts fall back into position for another blow on the string as before and so on as often and as quick in succession as the small pulley is revolved.

The connecting arm Y when the parts are in their normal positions rests by its lower end against the block *g''* limiting the movement backward of the parts connected therewith.

In applying this invention to a piano action, the two rock shafts extend the width of the action, the jack R, its escape block T and the parts directly connected therewith are arranged outside of the upright as shown in Fig. 1, and only one of each, as these parts are more particularly to operate the two rock shafts, but the parts operating directly on the regular hammer butt F are duplicated for each key, also the stop *w'* to the back catch, but although in the operation of the shafts some of these parts may be operated, they will have no effect upon a hammer unless its key is pressed down, and its hammer moved into position therefor, as herein stated, as it is necessary to press down a key to place its hammer in proper position to be operated upon by the parts of the present invention. Therefore in the operation of the independent jack R as many hammers will be operated upon as there

are keys pressed down and their respective hammers have the necessary parts of this invention in connection therewith.

To prevent the block T being moved back too far and thus be out of position to be acted upon by the jack R when desired, a button or stop *a''* secured to a screw wire *b''* screwing through the block *g*, is adjusted in position for the arm *d''* of the block T to abut against it as desired.

Having thus described my invention, what I claim is—

1. In a piano forte action, the combination with its hammer, of an arm pivoted to a suitable support, a rock shaft adapted to turn in suitable bearings, an arm secured to said shaft to operate on said pivoted arm, a hammer butt secured to said shaft, a jack to engage with said hammer butt, a lever to which said jack is pivoted and means for operation on said lever.

2. In a piano forte action, the combination with its hammer, of an arm pivoted to a suitable support, a rock shaft adapted to turn in suitable bearings, an arm secured to said shaft to operate on said pivoted arm, a hammer butt secured to said shaft, a jack to engage with said hammer butt, a lever to which said jack is pivoted, and a rotating shaft to which said lever is connected.

3. In a piano forte action, the combination with its hammer, of an arm pivoted to a suitable support, a rock shaft adapted to turn in suitable bearings, an arm secured to said shaft to operate on said pivoted arm, a hammer butt secured to said shaft, a jack to engage with said hammer butt, a lever to which said jack is pivoted, a pitman rod connected to said jack lever, and a revolving shaft to which said pitman rod is connected for operation thereof.

4. In a piano forte action, the combination with its back catch, of a rock shaft, a block or button secured to said rock shaft, and means for operating said shaft to move the block or button into position for the back catch to abut against it.

5. In a piano forte action, the combination with a rock shaft adapted to be operated by suitable means, an arm secured thereto, a jack

pivoted to a suitable support, an arm pivoted to a suitable support, and connected by a bar to said rock shaft arm to operate said pivoted arm to move into position to abut against and hold said jack from operation.

6. In a piano forte action, the combination with its hammer, of an arm pivoted to a suitable support, a rock shaft adapted to turn in suitable bearings, an arm secured to said shaft to operate on said pivoted arm, a hammer butt secured to said shaft, a jack to engage with said hammer butt, a lever to which said jack is pivoted, a pitman rod connected to said jack lever, and connected to a crank arm on a revolving shaft, a rock shaft adapted to turn in suitable bearings, a stop or button on said shaft in position for the back catch of the action to abut against, an arm on said latter rock shaft, mechanism connected to said rock shaft, a spring bearing on said arm and means for moving said arm for operation thereof.

7. In a piano forte action, the combination with its hammer, of an independent jack, a lever to which said jack is pivoted, a pitman rod connected to said jack lever and to a crank arm on a revolving shaft, a pulley on said shaft, another pulley having a crank arm for operation thereof, said pulleys being connected together by a belt.

8. In a piano forte action, the combination with its hammer, of an arm pivoted to a suitable support, a rock shaft adapted to turn in suitable bearings, an arm secured to said shaft to operate on said pivoted arm, a hammer butt secured to said shaft, a jack to engage with said hammer butt, a lever to which said jack is pivoted, means for operation of said jack lever, a second rock shaft, a block or button secured to said second shaft, an arm on said latter shaft for operation thereof and a spring bearing on said arm.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AUGUSTE T. ROUSSEAU.

Witnesses:

EDWIN W. BROWN,
GEO. A. ROUSSEAU.