(No Model.)

2 Sheets—Sheet 1.

G. M. GUILD.

UPRIGHT PIANO ACTION.

No. 472,478. Patented Apr. 5, 1892.

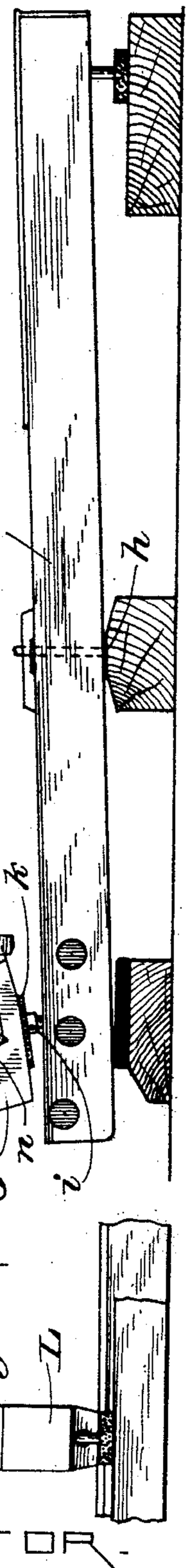

FIG. 2.

FIG. 1.

WITNESSES.

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Henry W. Arbon

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George M. Guild

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(No Model.) 2 Sheets—Sheet 2.

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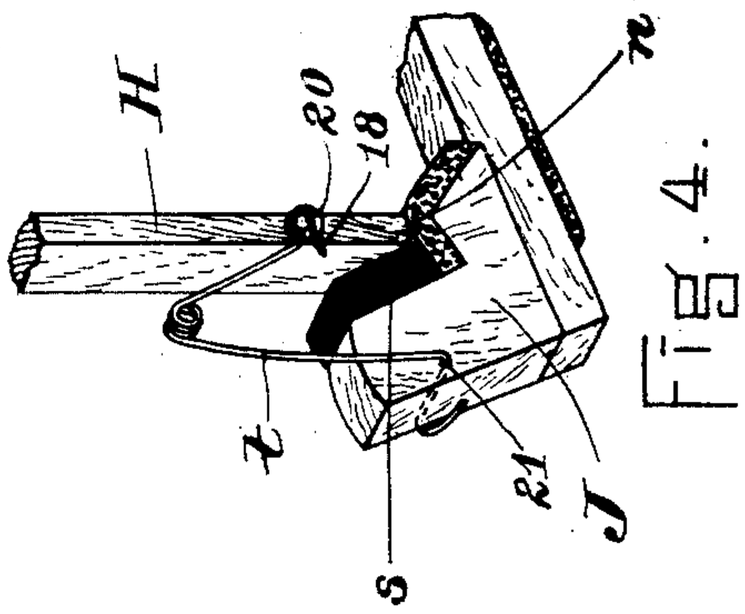

FIG. 4.

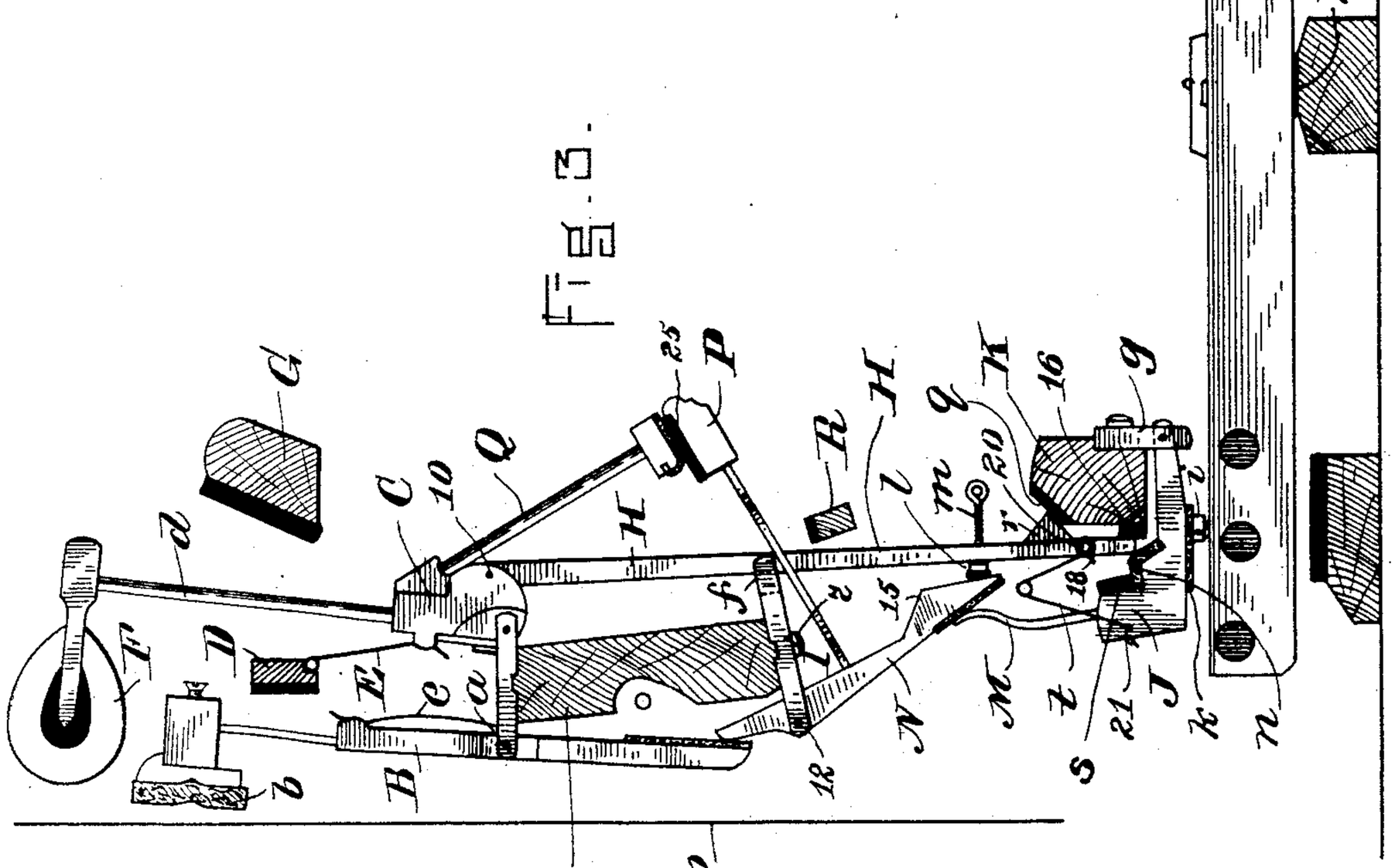

FIG. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE MORSE GUILD, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO L. A. GUILD, OF SAME PLACE.

UPRIGHT-PIANO ACTION.

SPECIFICATION forming part of Letters Patent No. 472,478, dated April 5, 1892.

Application filed August 22, 1891. Serial No. 403,463. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MORSE GUILD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Upright-Piano Actions, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation of an upright-piano action constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation of the same with the parts in the positions which they occupy when the key is depressed; Fig. 4, a detail in perspective to be referred to.

My invention relates to upright-piano actions, and has for its object to simplify and reduce the cost of construction and to produce at the same time a light, elastic, and powerful action which will not be injuriously affected by climatic changes and in which the notes can be repeated in a more perfect and effective manner than heretofore; and to this end my invention consists in certain novel combinations of parts and details of construction, as hereinafter set forth and specifically claimed.

In the said drawings, A represents the center rail, to the top of which is secured the flange *a*, to the opposite ends of which are pivoted the hammer-heel C and the damper-lever B, carrying the damper *b*.

D is the hammer-spring rail, and E the hammer-spring.

F is the hammer; *d*, the hammer-stem; G, the hammer-rail, and *e* the damper-spring, the parts thus far referred to being arranged and, with the exception of the rail A, constructed in the usual manner.

To the heel of the hammer is pivoted at 10 what I term a "combined lifter-rod and jack" H, which slides within a bushed slot or groove *f* in a guide-flange I, secured to the bottom of the rail A, by which it is steadied and prevented from having any lateral movement, said flange I being made adjustable on the rail A by means of a screw 7 and slot, (not shown,) whereby the lifter-rod and jack can be easily adjusted to bring it exactly into line with the adjustable jack-butt. The lower end of the lifter-rod and jack H rests upon the adjustable jack-butt J, which is pivoted at its front end to the flange *g* of a rail K and is raised to operate the hammer by the key L, fulcrumed at *h* and provided near its rear end with an adjusting-screw *i*, the head of which bears upon a cushion *k*, applied to the under surface of the jack-butt, and by means of this screw *i* the parts can be adjusted to compensate for wear, the head of the screw being provided with holes to receive the end of a rod or other implement, by which it may be turned to effect the adjustment required.

To the rear end of the jack-butt J is secured the "throw-off spoon" M, which when the key L is depressed is brought into contact with an intermediate lever N, pivoted at 12 to the guide-flange I, the lower enlarged end 15 of this lever being thus caused to strike an adjustable button *l*, secured to the end of a regulating-screw *m*, passing through the lifter-rod and jack H, whereby the lower end of the said lifter-rod and jack is thrown off its seat *n* to allow the hammer to recede from the string *p*, and by means of this screw *m* the operation of these parts may be regulated with the greatest nicety.

The upper or short arm of the lever N is not normally in contact with the lower end of the damper-lever B, but is slightly removed therefrom, and is brought into contact therewith to actuate the same, as required, when operated by the throw-off spoon M on the depression of the key L, and by making the lower arm of the intermediate actuating-lever N of great length and the upper arm above the pivot short, as shown, the leverage is increased so that the key will move the damper with the greatest ease and without the contact of the short arm of the lever N with the damper-lever B as the key is depressed, being felt by the performer in the slightest degree, even if a stiff damper-spring is employed, the action being by this construction rendered easy and elastic. Furthermore, by employing the throw-off spoon M, projecting

from the jack-butt to actuate the lever N, the necessary amount or range of motion is secured to move the long arm of the said lever N a sufficient distance to produce the required movement of the damper-lever, and as the lower end of the lever N is normally situated some little distance from the regulating button *l* it does not come into contact with it until the hammer has nearly touched the string, and consequently the lifter-rod and jack remains upon the shoulder or seat *n* of the jack-butt until after the blow has been struck, when the lifter-rod and jack is instantly thrown off its seat *n* against an elastic strip or buffer 16, secured to the rail K and forming a back-stop therefor, as seen in Fig. 3. By this means the blow of the hammer upon the string is given with its full force before the lifter-rod and jack commences to be thrown off the shoulder or seat *n* of the jack-butt, resulting in the full force of the blow upon the key being always transmitted to the string. Furthermore, this construction enables me to use a stronger hammer-spring E than is usually employed, and still preserve a light action, a strong spring being often desirable, as it throws back the hammer more quickly and with absolute certainty in case the joint should be affected by dampness. The weight of the lifter-rod and jack, combined with that of the bumper, to be hereinafter described, also assists the spring in throwing back the hammer after striking the string.

The upper inner edge of the rail K is beveled, as at *q*, and co-operates with a block *r*, projecting from the front side of the lifter-rod and jack H, and beveled on its under side to correspond with the bevel *q* of the rail K, and as the lifter-rod and jack commences to fall on the release of the key L the block *r* drops onto the bevel *q*, forcing back the lifter-rod and jack H and causing its lower end to be instantly returned to its original position on the seat *n* of the jack-butt against the stop *s*, ready for a repetition of the blow of the hammer. By this construction I am enabled to reseat the end of the lifter-rod and jack on the shoulder *n* of the jack-butt very soon after the key L is released and when the hammer has receded but a short distance from the string, which gives me the advantage of being able to repeat rapidly without removing the finger from the key and at the same time cause the hammer to give a fine and perfect blow each time it strikes the string.

To still further increase the repeating qualities of the action, I provide the lifter-rod and jack H with a light spring *t*, at one end of which is formed a hook 18, which fits over a pin 20, projecting from the side of the lifter-rod and jack, so that it can easily be detached therefrom when necessary, the opposite end of the spring *t* being bent at a right angle and passed through a hole 21 in the jack-butt and afterward bent around the rear end of the same, as seen in Fig. 4. The bent end of the spring *t* moves freely in the hole 21, so that the spring is pivoted at this point, and is consequently free to oscillate, as is necessary to permit the lifter-rod and jack to drop off its seat *n* into the position seen in Fig. 3. As the key L is depressed, a slight tension both in a backward and upward direction is put upon the spring *t* by the further separation of its lower ends, which while it does not interfere in any manner with the receding of the hammer from the string nevertheless co-operates with the bevel *q* of the rail K and the beveled block *r* and assists in placing the end of the lifter-rod and jack H onto the shoulder or seat *n* of the jack-butt the moment the key L is relieved of the pressure of the finger, the parts being thus ready for another blow when the hammer has receded but a very short distance from the string.

P is the back-catch, which is secured to and projects at or nearly at a right angle from the front side of the intermediate lever N, by which the damper B is operated. This catch P is provided with an elastic cushion 25, which when the lever N is actuated by the throw-off spoon on the key being depressed, as described, is brought up firmly and squarely against the lower end of a long bumper Q, serving, as it is pressed against it, to hold the hammer from rebounding as soon as it has struck the string and has fallen back, as seen in Fig. 3. By thus securing the back-catch to the lever N and making the bumper Q of great length, so that its lower end will have an extended range of motion as the hammer swings on its pivot, the back-catch and bumper will always be at or nearly at right angles to each other, causing the pressure of the back-catch to be always exerted upon the bumper endwise or in the direction of its length, holding it firmly and securely, whether the blow of the hammer be a light or a powerful one, and consequently there will no tendency of the end of the bumper to slide or slip down on the back-catch, as has heretofore been liable to occur, and which is very objectionable, as it produces a wedging of the back-catch and bumper together and a consequent choking of the action, owing to their failure to separate on the release of the key. With my improved construction any extra pressure on the key to produce a powerful blow of the hammer will only cause the back-catch to be pressed more firmly against the end of the bumper without any slip in any direction, and as soon as the key is released the back-catch and bumper will separate at once, leaving the parts free to operate as before described, while when the key is depressed the back-catch and bumper are kept a short distance apart and only come into contact when the hammer falls back from the string, the bumper being then instantly caught by the back-catch and held firmly, as required, until the key is released.

R is a rail upon which the back-catch drops on the release of the key, the weight of the

back-catch serving to return the lever N to its normal position with its lower end in contact with the throw-off spoon M, as seen in Fig. 2.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an upright-piano action, the lifter-rod and jack pivoted to the hammer-heel and provided with the button *l*, in combination with the jack-butt pivoted to the flange of the rail K, the throw-off spoon M, projecting from the jack-butt, and the intermediate lever N, arranged between the throw-off spoon and the button *l*, substantially as set forth.

2. In an upright-piano action, the lifter-rod and jack pivoted to the hammer-heel and provided with the block *r*, in combination with the rail K, having a bevel or incline *q*, and the jack-butt, substantially as described.

3. In an upright-piano action, the back-catch P, secured to the lever N, the latter operated by the jack-butt, in combination with the bumper Q, projecting from the hammer-heel, substantially as described.

4. In an upright-piano action, the combination, with the lifter-rod and jack pivoted to the hammer-heel and operated by the jack-butt, as described, of the lever N, the back-catch P, secured to and projecting from the front side of the lever N, and the bumper Q projecting down from the hammer-heel and adapted to be caught and held by the back-catch P as the lever N is actuated, substantially as described.

5. In an upright-piano action, the combination of the lifter-rod and jack pivoted to the hammer-heel and provided with the button *l*, the jack-butt J, provided with the throw-off spoon M, the lever N, the back-catch P, secured to the lever N, and the bumper Q, projecting from the hammer-heel, said back-catch when actuated by the lever N being brought squarely against the end of the bumper Q, substantially in the manner and for the purpose set forth.

6. In an upright-piano action, the lifter-rod and jack pivoted to the hammer-heel and provided with the button *l*, in combination with the jack-butt J, pivoted to the flange of the rail K, the intermediate lever N, the throw-off spoon M, projecting from the jack-butt and adapted to move the lever N into contact with the button *l*, the rail K, with its bevel or incline *q*, and the block *r*, the latter adapted by contact with the incline *q* to seat the lifter-rod and jack upon the shoulder *n* of the jack-butt, substantially as set forth.

7. In an upright-piano action, the combination, with the lifter-rod and jack pivoted to the hammer-heel and operated by the jack-butt, as described, of the lever N, the back-catch P, secured to and projecting from the front side of the lever N, and the elongated bumper Q, projecting down from the hammer-heel and adapted to be caught and held without slip by the back-catch as the lever N is actuated, substantially as and for the purpose set forth.

8. In an upright-piano action, the jack-butt J, pivoted at its front end to the flange of the rail K and having the seat or shoulder *n* and stop *s*, and the lifter-rod and jack H, pivoted to the hammer-heel and resting at its lower end upon said jack-butt, in combination with the key L, provided with the adjusting-screw *i*, the latter adapted to contact with the under side of the jack-butt to lift the same, substantially as described.

9. In an upright-piano action, the combination, with the lifter-rod and jack pivoted to the hammer-heel and the jack-butt J, pivoted to the flange of the rail K, of the spring *t*, secured at one end to the jack-butt and connected at its opposite end to the lifter-rod and jack, substantially as and for the purpose set forth.

10. In an upright-piano action, the combination, with the lifter-rod and jack and the jack-butt, of the spring *t*, pivoted at one end to the jack-butt, whereby it is free to oscillate thereon as the lifter-rod and jack is thrown off and onto the seat *n*, said spring *t* being provided at its opposite end with a hook engaging a pin on the lifter-rod and jack, all operating substantially as described.

11. In an upright-piano action, the lifter-rod and jack pivoted to the hammer-heel and provided with the button *l*, in combination with the jack-butt J, pivoted to the flange of the rail K and having the seat or shoulder *n*, the intermediate lever N, the throw-off spoon M, projecting up from the jack-butt and adapted to move the lever N into contact with the button *l*, the rail K, with its bevel or incline *q*, the block *r*, adapted by contact with the incline *q* to seat the lifter-rod and jack upon the shoulder *n* of the jack-butt, and the spring *t*, secured at one end to the jack-butt and at the opposite end to the lifter-rod and jack, all operating substantially in the manner and for the purpose set forth.

12. In an upright-piano action, the combination, with the lifter-rod and jack H and the jack-butt J, operating as described, of the flange I, made adjustable upon the rail A and provided with a guide slot or groove *f* for the lifter-rod and jack, whereby the latter can be adjusted to bring it into line with the jack-butt, substantially as described.

13. In an upright-piano action, the combination of the damper and damper-lever, the latter pivoted to the flange *a* of the rail A, the pivoted jack-butt, and an intermediate lever operated by the jack-butt and adapted to actuate the damper-lever on the depression of the key, substantially as set forth.

14. In an upright-piano action, the combination of the damper and damper-lever, the latter pivoted to the flange of the rail A, the intermediate actuating-lever N, and the jack-butt J, with its throw-off spoon M, the latter adapted to contact with the lever N to actuate the damper-lever on the depression of the key, substantially as described.

15. In an upright-piano action, the combina-

tion of the rail A, flange *a*, hammer F, hammer-spring E, guide-flange I, with its slot *f*, lifter-rod and jack H, with its adjustable button *l* and block *r*, the rail K with its bevel or incline *q*, the jack-butt J, pivoted to the flange *g* of the rail K and provided with the seat or shoulder *n* and throw-off spoon M, the key L, provided with the adjusting-screw *i*, the lever N, the back-catch P, secured to the lever N, the bumper Q, projecting from the hammer-heel, and the spring *t*, having one end connected with the jack-butt and the other end with the lifter-rod and jack, all constructed and arranged to operate substantially as set forth.

16. An action for upright-pianos, substantially as described, the same consisting of the rail A, flange *a*, hammer F, guide-flange I with its slot *f*, lifter-rod and jack H, with its adjustable button *l*, and block *r*, the rail K, with its bevel or incline *q*, the jack-butt J, pivoted to the flange *g* of the rail K and provided with the seat or shoulder *n* and throw-off spoon M, the spring *t*, having one end connected with the jack-butt and the other end with the lifter-rod and jack, the key L, provided with the adjusting-screw *i*, the lever N, the bumper Q, projecting from the hammer-heel, the damper *b*, damper-lever B, pivoted to the flange *a* and adapted to be actuated by the lever N, and the damper-spring *e*, all constructed and arranged to operate substantially as described.

17. In an upright-piano action, the combination of the rail A with its flange *a*, the hammer F, hammer-spring E, guide-flange I with its slot *f*, lifter-rod and jack H, with its adjustable button *l* and inclined block *r*, the rail K, with its bevel or incline *q*, the jack-butt J, pivoted to the flange *g* of the rail K and provided with the seat or shoulder *n* and throw-off spoon M, the spring *t*, having one end pivoted to the jack-butt and the other end detachably connected with the lifter-rod and jack, the key L, provided with the adjusting-screw *i*, the lever N, the back-catch P, secured to the lever N, the bumper Q, projecting from the hammer-heel, the damper *b*, damper-lever B, pivoted to the flange *a* and adapted to be actuated by the lever N, and the damper-spring *e*, all constructed and arranged to operate substantially as set forth.

18. In an upright-piano action, the combination of the lifter-rod and jack H, pivoted to the hammer-heel and provided with the adjustable button *l*, the jack-butt J, pivoted to the flange *g* of the rail K and provided with the throw-off spoon M, the lever N, and the key L, with its adjusting-screw *i*, the latter forming a rest for the jack-butt, all operating substantially as set forth.

Witness my hand this 17th day of August, A. D. 1891.

GEORGE MORSE GUILD.

In presence of—
P. E. TESCHEMACHER,
R. HENRY MARSH.