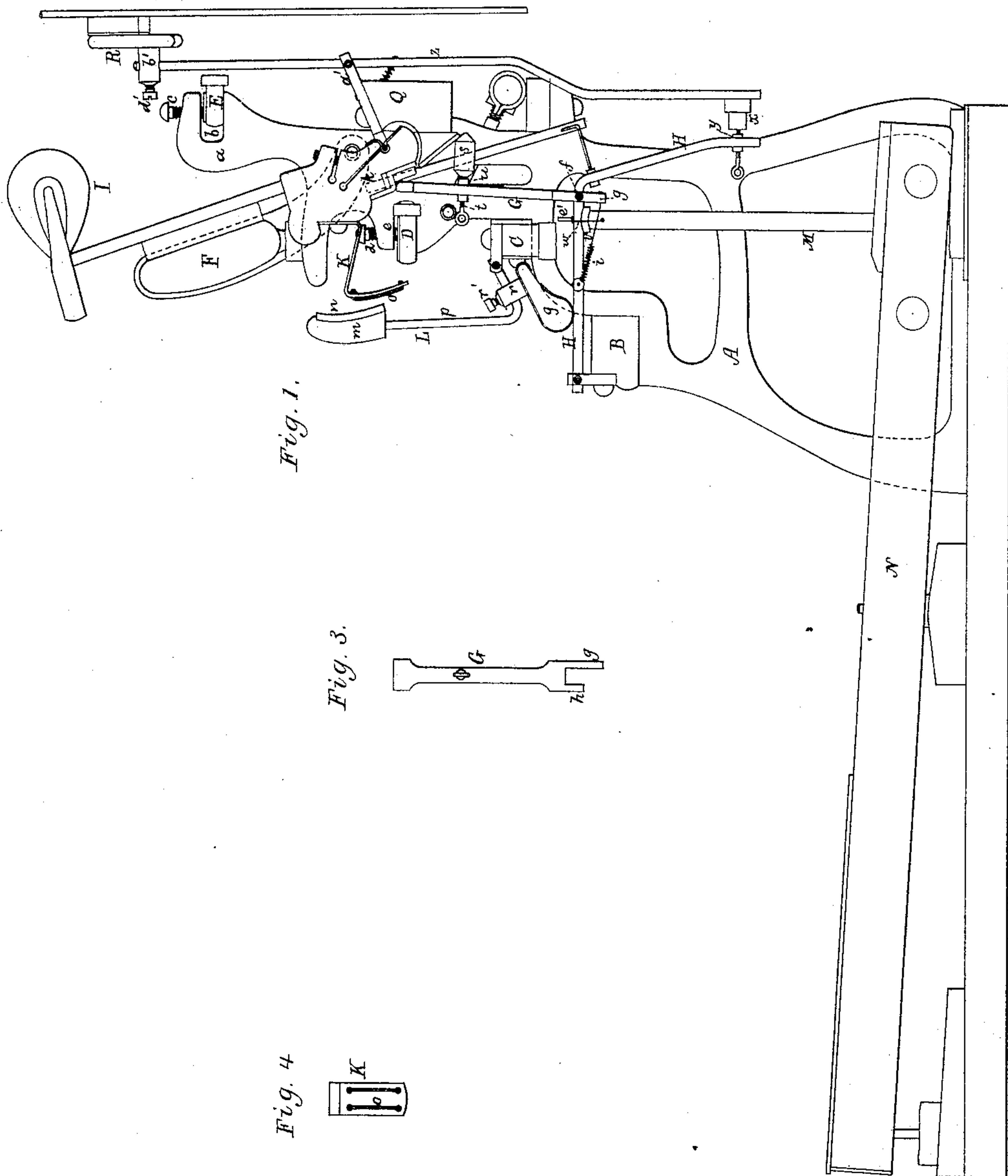


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Upright Piano-Forte Action.

No. 223,060.

Patented Dec. 30, 1879.



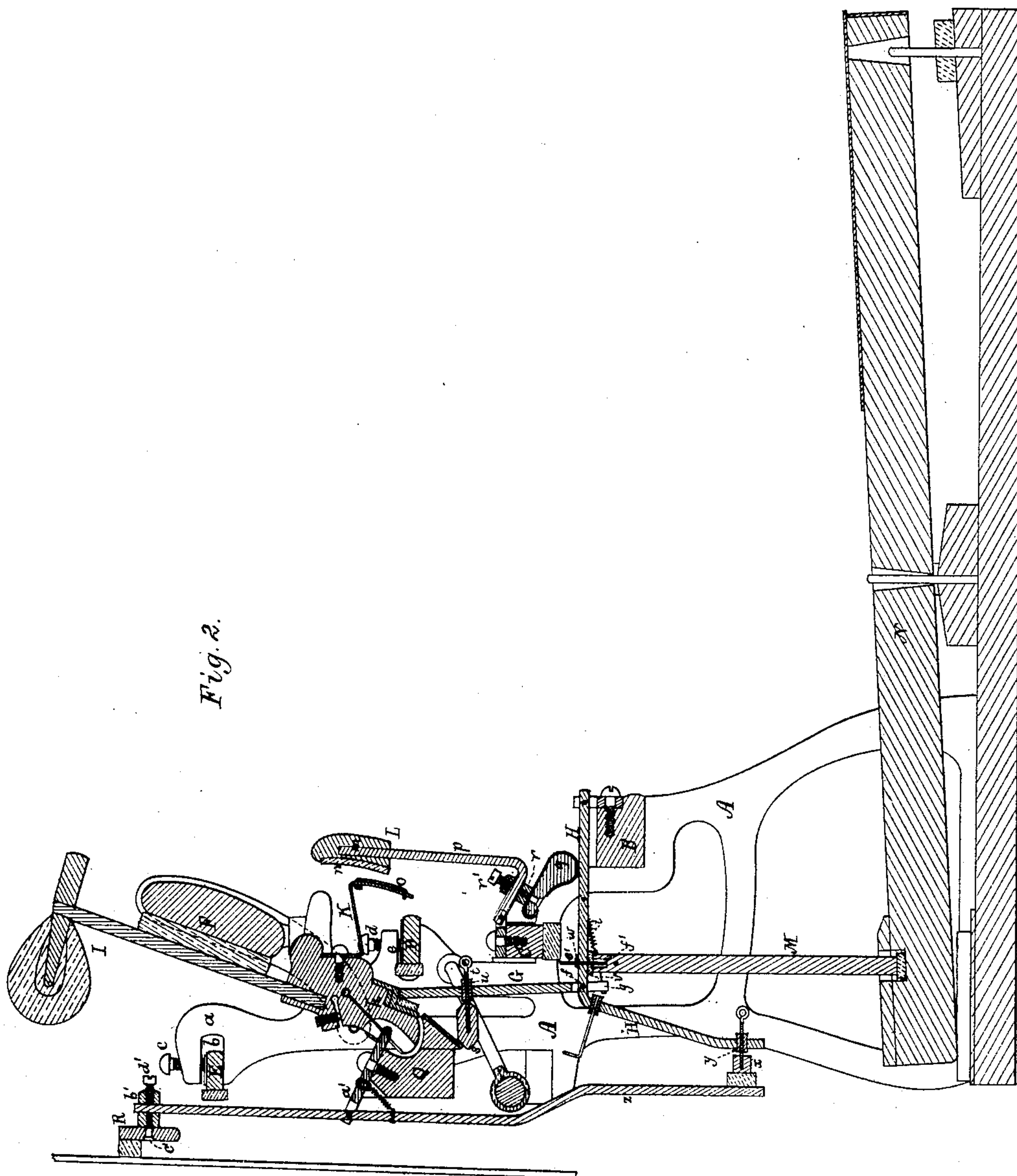
Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN UPRIGHT-PIANO-FORTE ACTIONS.

Specification forming part of Letters Patent No. **223,060**, dated December 30, 1879; application filed August 14, 1879.

*To all whom it may concern:*

Be it known that I, GEORGE W. NEILL, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Upright-Piano-Forte Actions; and I do hereby declare the same to be described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, and Fig. 2 a vertical section, of a piano-action and its sustaining-frame with my improvements applied thereto, they being duly enumerated and defined by the claims hereinafter presented.

In the said drawings, A denotes the metallic frame for supporting the different wooden rails B, C, D, and E of the action. The upper of such rails, which is the damper-check rail, is sustained by notched standards *a a*, extending up from the remainder of the frame, as shown. These standards are recessed, as represented at *b*, to receive the said rail, which is held in place by clamp-screws *c c*, arranged in the standards so as to screw down upon the rail.

The fly-check rail D is similarly applied to the frame—viz., in recesses *e e* made therein, as represented, and is held in place by set-screws *d d*. Either of the rails D or E, cushioned on its front edge, can be moved forward or backward to adjust it to its proper position.

The hammer-rest shown at F is applied or pivoted in the usual manner to the frame so as to be capable of being swung forward toward the strings. The standards *a a*, by their arrangement, serve not only as supports for the check-rail E, but as stops to arrest the hammer-rest F in its forward movement, such movement being imparted to such rest by means usually employed for the purpose.

The operative fly G of the hammer I make of metal, a front view of it being shown in Fig. 3. At its lower part it is furcated to straddle the fly-lever H, and to be connected therewith by a joint-pin, *f*, which goes through the said lever and the prongs *g h* of the fly. One of the said prongs is extended below the joint-pin, so as to convert the fly into a lever having a short arm, *g*, extending below the pin. To such arm and the lever H a helical spring, *i*, is applied, it being arranged along-

side of the said lever and adapted to pull the extension or prong *g* backward, so as to keep the fly up to the tail-block *k* of the hammer I.

From the tail-block a metallic arm, K, bent in manner as shown, is extended. This arm with its lacing forms the hammer-bumper, as it operates with the back catch, L, of the hammer to estop the hammer after each blow of it on the string. The head *m* of the back catch, L, is of wood, and cushioned, as shown at *n*. The bearing-part of the arm K is perforated to receive a lacing, *o*, of twine or cord, which extends up and down the outer surface of the said bearing-part in manner as represented in Fig. 4, which is a rear view of the arm K. The lacing is to operate with the cushion of the back catch to prevent the arm from slipping on the cushion, which would be liable to take place without the lacing or an equivalent therefor applied to the arm.

The stem of the back catch, L, is shown at *p*, as composed of a piece of wire bent at an acute angle, as shown, and pivoted or hinged to the rail C. The back-catch bearer *q* rests on the top of the fly-lever, which in this case is a metallic rod bent in manner as represented, and pivoted at or near its rear end to the rail B.

From the bearer a projection, *r*, extends upward and has a hole through it to receive the stem *p*, upon whose lower part the projection slides freely and is provided with a set-screw, *r'*, to screw into it and against the stem. From the above it will be seen that the bearer, while resting on the fly-lever, is adjustable on the stem *p* of the catch, whereby the proper adjustment of the catch to the arm K can be effected.

The fly-regulating button, shown at *s*, has its screw-stem *t* going through the fly, but instead of it being screwed into the fly itself, as is usually the case in piano-actions wherein the fly is made of wood, it is screwed into a cushioning bushing or tube, *u*, of cloth inserted in the fly. In this case the stem becomes not only cushioned in the fly, but is held to excellent advantage from accidental unscrewing.

As the fly-lever is a single metallic rod, bent in manner as represented, it becomes necessary to apply the raiser or push-rod M to it in a different manner from that usually practiced. This push-rod extends up from the key



N, upon which it is stepped. At its upper end the push-rod has a cushion, *v*, fixed on it, such cushion being held up to the fly-lever by a bridle, *w*, which is a cord that straddles the lever and push-rod and cushion, and at its ends is fixed to the push-rod. The bridle thus suspends the push-rod from the lever and enables the push-rod, in order for the key to be applied to or removed from it, to be swung in any required direction.

Besides the bridle and cushion, there is to support the raiser in position with the fly-lever a pin, *e'*, which, inserted through and fixed in said lever, extends into a hole, *f'*, made in the raiser, such hole having a diameter sufficiently larger than that of the pin to allow the necessary swinging movements of the raiser.

The regulating-button *x* of the fly-lever has its screw-stem applied to such lever by a tubular cushioning bushing, *y*, of cloth going through and fixed in the lever, the stem being screwed into and through the bushing.

I am aware that tubular cloth bushings in piano-actions are employed in various ways, but I have not before my invention thereof known one to be used with the stem of a regulating-button screwed into and through such bushing.

The damper-lever *z* I make as in a single piece of metallic wire pivoted to an arm, *a'*, extending from the hammer-support rail Q. The damper shown at R is not movable relatively to its support piece or shank *b'*, but is connected therewith by a screw, *c'*, which goes through the damper and screws into the support-piece, the damper being capable of being turned on the screw, so as and in order to adjust the damper to the inclination of the string, which cannot be effected when the damper and its shank are in one piece or in separate pieces glued to each other.

The damper-shank has a hole through it to receive the lever *z*, and is provided with a set-

screw, *d'*, arranged to screw against the lever and into the shank, such being for further aiding in adjusting the damper to the string.

What I claim as of my invention in the upright-piano action is as follows, viz.:

1. The combination of the push-rod M with the fly-lever H, by means substantially as described, namely, the cushion *v*, bridle *w*, and the vertical pin *e'*, arranged and adapted as explained.

2. The combination of the back-catch rod or stem *p* pivoted to the rail C, with the adjustable bearer *q*, applied to such rod or stem, and to the fly-lever H, substantially in manner as set forth.

3. The hammer-bumper as composed of the perforated metallic bent arm K, and a lacing, *o*, adapted thereto, as set forth.

4. The cushioning screw-bushing *u*, in combination with the screw-stem *t* of the regulating-button *s*, screwed therein, and with the fly G, or part for reception of such bushing.

5. The fly G, extended below its pivot or fulcrum, in combination with the spring *i*, arranged with and connected to the fly-lever H, and the downward extension or part *g* of the fly, as set forth.

6. The damper applied to its supporting-head, so as to be adjustable relatively thereto, as and for the purpose set forth, and fixed in position by the clamp-screw *c'*, suitably applied to it, in combination with such head adjustable on and lengthwise of the lever *g*, and provided with a clamp-screw, *d'*, to fix it to the said lever, all being substantially as shown and described.

7. The frame A, provided with the recessed or notched standards *a a*, adapted to support the damper-check rail and to serve as stops for the movable hammer-rest.

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Witnesses:

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