

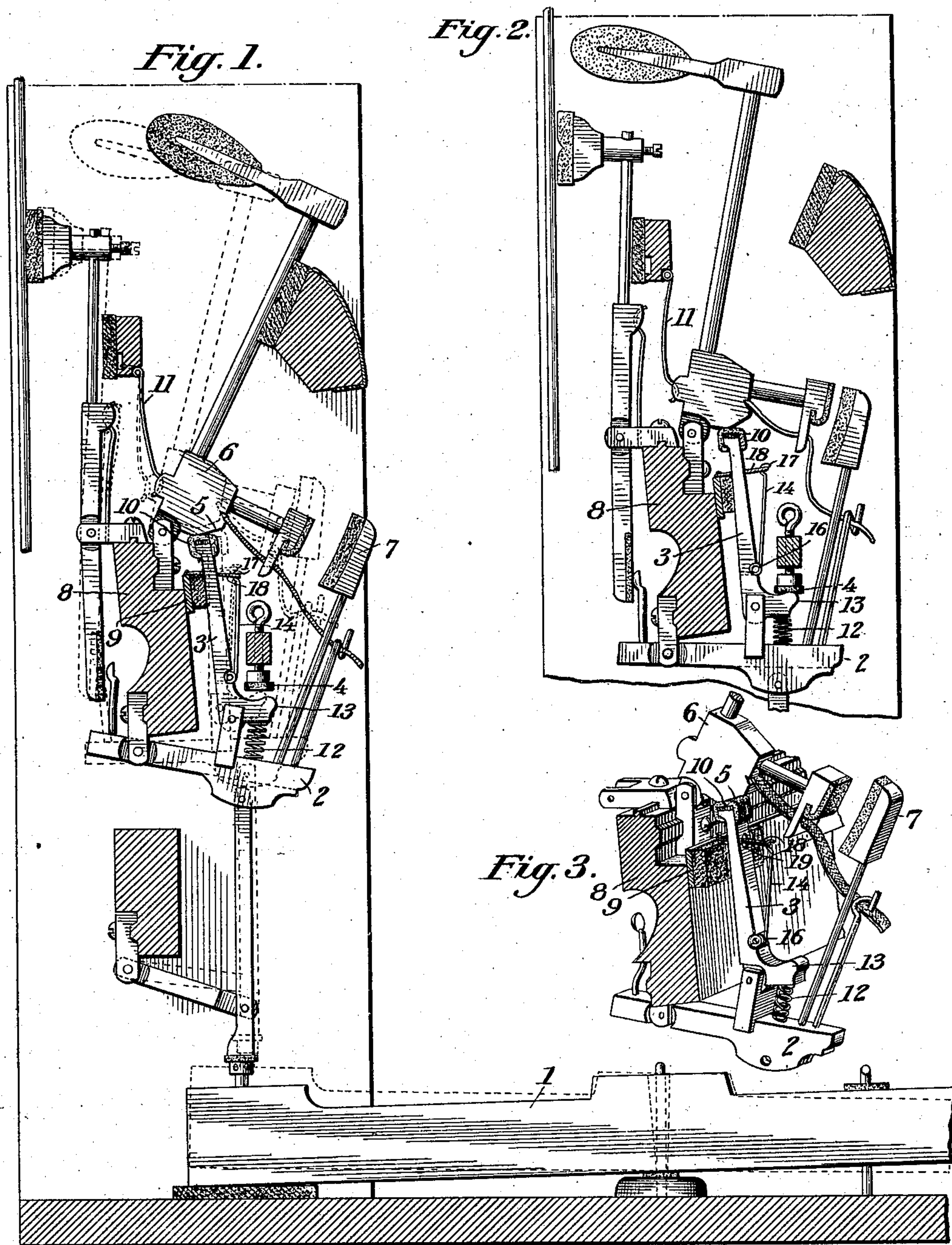
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L. N. SOPER.
PIANO ACTION.

(Application filed June 19, 1901.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 690,784, dated January 7, 1902.

Application filed June 19, 1901. Serial No. 65,169. (No model.)

To all whom it may concern:

Be it known that I, LEWIS NELSON SOPER, a subject of the King of Great Britain, residing at Guelph, Province of Ontario, and Dominion of Canada, have invented a certain new and useful Piano-Action, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to piano-actions of the type known as "upright-actions;" and the chief aim of this invention is to produce an upright-piano action having the solidity and durability of the ordinary standard action together with all the rapid-repeating qualities of the grand piano. In the general construction and arrangement of the parts of the action the usual lines are followed, with the exception that I employ an unclothed knuckle and a clothed jack, whereby greater durability and a more perfect and reliable adjustment are obtained, together with less cost than under the usual construction and arrangement.

With the above and other objects in view, the nature of which will appear more fully as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view through a piano-action, showing the several parts thereof constructed and arranged in accordance with the present invention, illustrating the initial position of the parts in full lines, and illustrating in dotted lines the position which the parts assume after a key has been fully depressed. Fig. 2 is a similar view showing the position the parts assume when the key is partially released, in which movement the jack is reseated in readiness for another stroke. Fig. 3 is a detail perspective view of the jack, hammer-butt, and contiguous parts, showing the means for reseating the jack.

Like numerals of reference denote like parts in all the figures of the drawings.

Referring to the drawings, 1 designates a key, 2 a whippen connected therewith, 3 the jack, 4 the regulating-button, 5 the knuckle, 6 the hammer-butt, 7 the back-check, and 8 the action-rail, the parts just enumerated be-

ing of the usual construction and assembled under the ordinary arrangement of such parts.

In carrying out the present invention, I make use of an auxiliary or supplemental rail 9, which is connected to the action-rail 8 and in reality forms a part or extension thereof. As a further means of producing the best results the knuckle 5 of the hammer-butt is unclothed, as clearly illustrated in the drawings, while the jack is clothed, as shown at 10, thus providing a more durable construction and one that remains in adjustment better than under the ordinary arrangement and at the same time costs less to manufacture. The knuckle 5 is beveled at its outer lower corner, as shown, and is given such special shape in order to secure the grand repeating movement. In combining the elements referred to I make use of a feather-spring 11 for the hammer and a coiled spring 12 under the jack-toe 13, and I further employ a jack-spring 14, provided at one end with a coil 16 where the spring is fastened to the jack, while the upper or opposite end of the spring is bent to form a hook 17, with which is connected one end of a flexible loop or connection 18, said connection passing through an opening 19 in the jack and being attached at its opposite or inner end to the action-rail 8 or to the extension 9 thereof, which forms the supplemental or auxiliary rail. On the said supplemental rail or extension of the action-rail I place a strip of soft felt or similar material, preferably equal in length to the distance between the brackets of the action, said strip of felt forming a cushion for all of the jacks, thereby doing away with the necessity for employing a separate cushion on each hammer-butt. The advantages arising from this construction and arrangement are that the hammer is left freer on its return movement from the string and several times the usual amount of wearing-surface is provided for the jack. Further, such construction makes provision whereby the inner ends of all the keys may be raised without moving the hammer-rail in order to get soft-pedal effects. The contact between the action and keys will be perfect, also the repeating effect, and there will be an entire absence of lost action. Further, no special regulating is required when the parts

are combined and regulated in the manner described.

Various expedients have been devised embodying a spring between the jack and action-rail; but in every case they have been substituted for the toe-spring and are undesirable in working, for the reason that they were not uniform in action or in the amount of force applied, being used simply because the form of the device would not admit of the employment of the toe-spring. Such springs were not designed for the purpose of attaining a true and reliable rapid-repeating effect, but simply to pull the jack under the knuckle when the position of the parts in their movements would allow the jack to slip home. The flexible loop or connection of this invention which extends between the jack-spring and the action-rail is for a distinctly different purpose, true repeating means lifting the hammer from any position it may reach when the key is released, so that the jack is instantly resealed. This desirable result is accomplished by the present invention in the mechanically shortest space of time.

The operation is as follows: When a key is struck, at whatever point the hammer comes to check when the key is raised sufficient to release the back-check the clothed end of the jack pressing against the smooth incline of the knuckle with the force of the jack-spring through the medium of the loop or flexible connection to the action-rail and assisted by the toe-spring tips the hammer forward, sliding at the same time along the knuckle until it is resealed thereunder. This result is accomplished before the jack is free from the regulating-button, and said jack is therefore ready for another stroke.

In view of the foregoing description it will therefore be seen that the rapid repeating effect is secured without any radical departure from the ordinary lines at present in vogue and increasing rather than impairing the durability of the action while economizing in the cost of production.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an upright-piano action, the combination with a hammer-butt, jack, and spring on the jack, of a flexible connection between the free end of the jack-spring and the action-rail, substantially as and for the purpose specified.

2. In an upright-piano action, the combination with a hammer-butt, jack, and spring on the jack, of a flexible connection between the free end of the spring and the action-rail, and a continuous jack-cushion attached to the action-rail and extending between the action-brackets, substantially as described.

3. In an upright-piano action, the combination with a hammer-butt, an apertured jack, and a spring mounted on the jack, of a supplemental rail forming a part or extension of the action-rail, a continuous jack-cushion attached to such supplemental rail or extension and extending between the action-brackets, and a flexible connection between the free end of the jack-spring and the action-rail extension.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS NELSON SOPER.

Witnesses:

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