

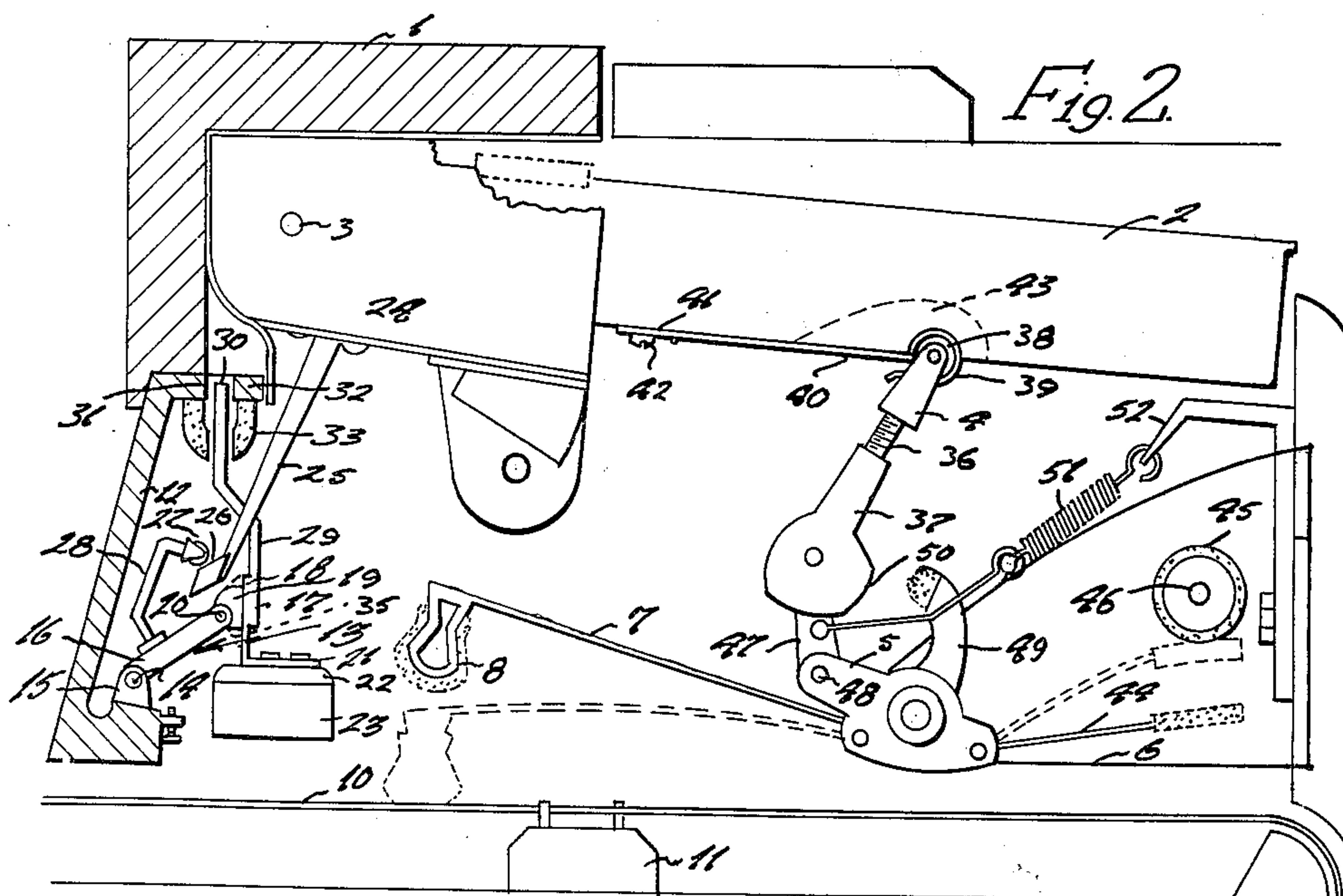
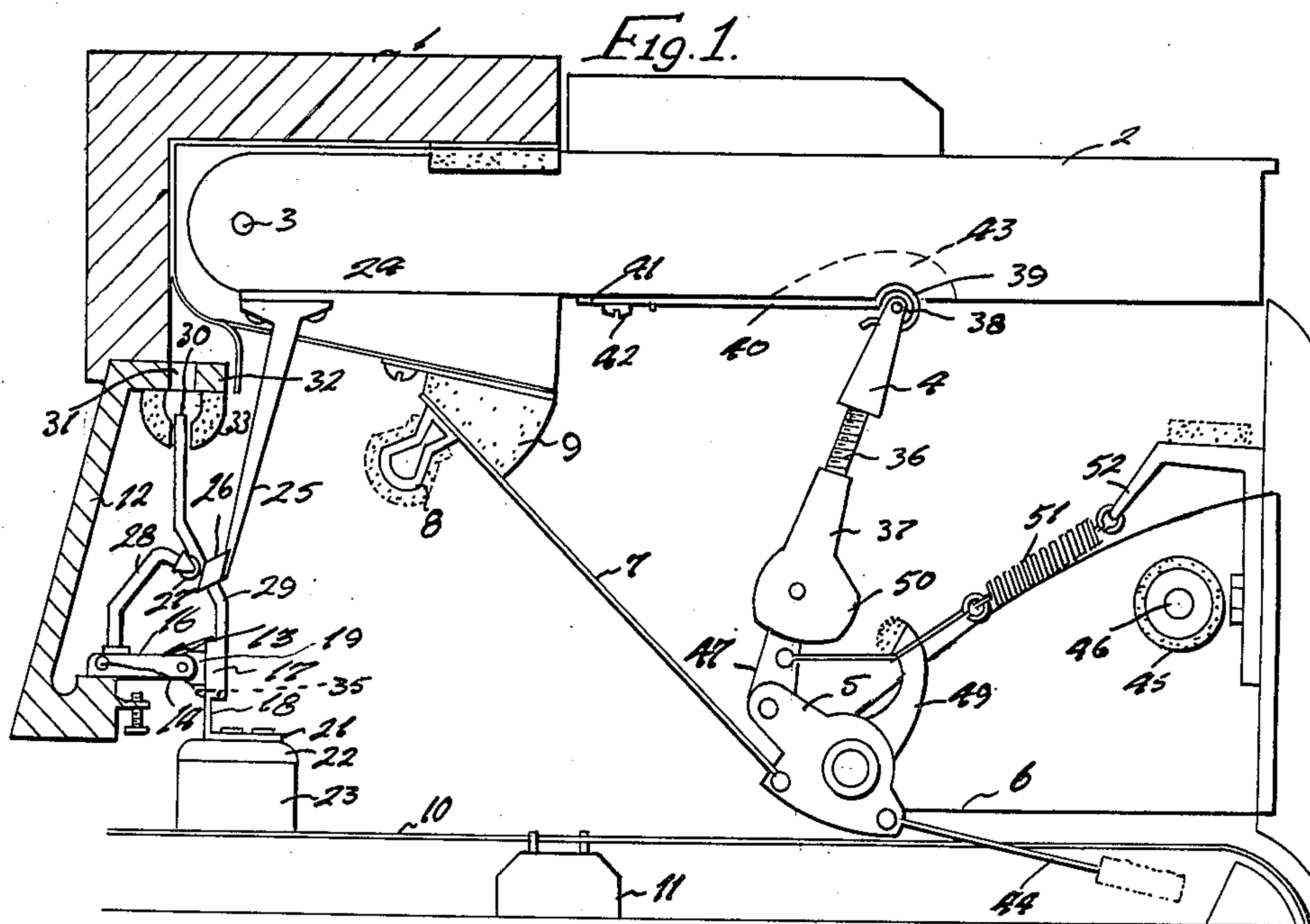
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STRING DAMPER ASSEMBLY FOR MUSICAL INSTRUMENTS

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STRING DAMPER ASSEMBLY FOR MUSICAL INSTRUMENTS

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1 Claim. (Cl. 84-255)

My invention relates to new and useful improvements in string damper assemblies for musical instruments which includes strings impacted by a hammer or the like in order to produce the necessary note, the principal object and essence of my invention being to provide a damper assembly of the character herewithin described which is actuated by the note bar and adapted to contact the string when the note bar is at rest, but to be removed from the string when same is being struck by the hammer.

A further object of my invention is to provide a device of the character therewithin described in which the damper head is automatically maintained in contact with the strings that are not being used, thereby preventing any harmonic vibrations from transferring from one string to another.

Another object of my invention in conjunction with the foregoing object, is to provide a device of the character herewithin described in which the damper head is removed from the strings as soon as the note bar is depressed and returns into contact with the strings when the note bar is released.

Another important object of my invention is to provide means whereby the hammer is lifted from the string as soon as it has hit the string and to prevent the hammer from rebounding and hitting the string a second time.

A yet further object of my invention is to provide a device of the character herewithin described which is economical in manufacture, simple in construction and otherwise well suited to the purpose for which it is designed.

With the foregoing objects in view, and such other objects and advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings in which:

FIGURE 1 is a side elevation, sectioned in part, of an instrument showing one note assembly and my string damper assembly, the note bar being in the released position and the damper head contacting the string.

FIGURE 2 is a view similar to FIGURE 1, sectioned in part, and with parts broken away, but with the note bar depressed and the damper head in the clear position, when string is struck by hammer.

In the drawings like characters of reference indicate corresponding parts in the different figures.

In my United States Patent No. 2,532,226, dated November 29, 1950, I described string instruments in which the notes were produced by the impact of a series of hammers against a corresponding series of strings, each of which was attuned for a different note. The string damper assembly and note bar assembly hereinafter to be described, has been found more suitable to that shown in the above mentioned patent and proceeding now to describe my invention in detail, it will be seen that I have illustrated part of the supporting framework 1 of the instrument beneath which the note bars 2 are pivotally secured upon rods 3.

Linkage 4 extends intermediate the ends of the note bar 2 to a bell crank 5 mounted upon a support 6, via pivot 6', a hammer arm 7 extending from the bell crank and carrying hammer 8 upon the distal end thereof. When in the position shown in FIGURE 1, the distal end of

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the hammer arm 7 rests against a felt pad 9 immediately above the associated string 10 secured to bridge 11.

A support member 12 is secured to the portion 1 and extends downwardly therefrom, said support member carrying my damper assembly collectively designated 13. This damper assembly consists of a pivot rod 14 supported within shoulders 15, said pivot rod carrying a lever 16 which is adapted to pivot upon rod 14.

To the opposite end of lever 16 is pivotally secured a damper head assembly 17 consisting of an angulated bracket 18 having a lug 19 formed thereon by which means the head is pivotally secured to the lever 16 by pin 20. The lower flange 21 of the bracket 17 carries a block 22 to the underside of which is secured a felt damper 23 situated immediately above the associated string 10.

Secured to the underside of the note bar 2 adjacent the inner end 24 thereof is a damper actuator lever 25 having a shaped cam 26 upon the distal end thereof, said cam being engageable by a roller 27 carried upon the upper end of a support 28, which in turn is secured adjacent the inner end of the aforementioned lever 16.

An off-set guide bar 29 is secured to the bracket 17 and extends upwardly, the upper end 30 thereof engaging a slot 31 formed in the upper flange 32 of the aforementioned support member 12, a slotted leather flange 33 being provided to assist in the support thereof. This guide bar ensures that the damper head 23 reciprocates vertically at all times.

A weight 35 is provided and secured to the rear of bracket 17 to prevent the damper vibrating when in contact with the string.

In operation, reference should first be made to FIGURE 1 of the accompanying drawings which shows the note bar 2 in the uppermost position, under which circumstances the roller 27 is in engagement with the lower portion of the cam 26 and the damper 23 is in contact with the string 10.

However, when the note bar 2 is depressed, as shown in FIGURE 2, the distal end of the actuator 25 moves leftwardly with regards to FIGURES 1 and 2 and causes the roller 27 to ride upwardly upon the cam, thus lifting the damper assembly pivoting upon rod 14, so that the damper 23 is raised clear of the string 10, at which time the string is struck by the hammer 8. Conversely, as soon as the note bar is released, the actuator 25 moves rightwardly, allowing damper 23 to come to rest on string 10 by gravity.

To further enhance the tone of my device I would refer back to the linkage 4 between the note bar 2 and the bell crank 5. The linkage 4 is adjustable within limits by the screw threaded engagement of the portion 36 within the portion 37. Within the upper end of 36 is mounted a small roller 38 which in turn is held by the surrounding end 39 of a leaf spring 40. This leaf spring 40 is secured by the other end 41 to the underside of note bar 2 by means of screw 42. The underside of the note bar 2 is hollowed out as at 43 to permit the upward movement of the spring end 39.

A further leaf check spring 44 is secured by one end thereof to the bell crank 5 and extends rearwardly therefrom. A soft roller or pad 45 is mounted by pin 46 to the support 6.

In order to ensure that the hammer 8 is raised well clear of the string 10 after it has been struck and to prevent the hammer from rebounding to the string again, I have provided a further linkage connection between the portion 37 and the bell crank 5. A link 47 is pivotally secured by one end thereof within the lower end of the portion 37 and by the other end thereof to the bell crank as at 48.

Bell crank 48 is provided with a curved horn 49 which strikes the side 50 of the portion 37 as the hammer strikes

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the string 10 and breaks the joint between line 47 and portion 37 against the pressure of a return spring 51 reacting between the link 47 and the spring anchor 52. This immediately raises the hammer clear of the string as shown in FIGURE 2 thus ensuring that the hammer does not rebound to hit the string again.

When the note bar is struck, the spring 51 maintains the link 47 and the portion 37 in a straight line so that the hammer 8 strikes the string 10 and the check spring 44 engages the roller 45. If normal pressure is used, the portion 49 does not engage the portion 50 but if excessive pressure is used then the bell crank is rotated further so that the linkage between 47 and 50 is broken as shown in FIGURE 2 thus immediately raising the hammer clear of the string by the action of the check spring 44.

Since various modifications can be made in my invention as hereinabove described, and many apparently widely different embodiments of same made within the spirit and scope of the claim without departing from such spirit and scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense.

What I claim as my invention is:

In a musical instrument, the combination of a frame, a depressible note bar pivoted at one end thereof to said frame, a string underlying said note bar, a hammer operatively connected to said note bar and adapted to strike said string when the note bar is depressed, and a string damper assembly comprising a support member having an upper portion secured to said frame and a lower portion, a vertically swingable lever pivoted at one end thereof to the lower portion of said support member above said

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string, an angle bracket having a vertical arm pivotally connected to the other end of said lever and a horizontal arm, a damper pad carried by the horizontal arm of said angle bracket, said damper pad being respectively engageable with and disengageable from said string when said bracket is lowered and raised by said lever, an upwardly extending bar secured at its lower end to the vertical arm of said angle bracket, a vertically apertured guide carried by the upper portion of said support member and having the upper end portion of said bar slidable therein whereby to guide the raising and lowering movement of said angle bracket and damper pad, a rod-shaped actuator secured to the intermediate portion of said lever and extending upwardly therefrom, a rotatable roller mounted at the upper end of said actuator, a limb secured to the pivoted end portion of said note bar and projecting downwardly therefrom, and a cam provided at the lower end of said limb, said cam being engaged by said roller whereby said actuator may raise said damper pad from said string when said note bar is depressed and whereby the damper pad may return by gravity to its string engaging position when the note bar is released.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | |
|-----------|---------|---------------|
| 1,605,304 | Vasey | Nov. 2, 1926 |
| 2,532,226 | Hartman | Nov. 28, 1950 |

FOREIGN PATENTS

| | | |
|---------|---------------|---------------|
| 166 | Great Britain | 1886 |
| 151,526 | Germany | May 21, 1904 |
| 72,567 | Austria | Oct. 25, 1916 |