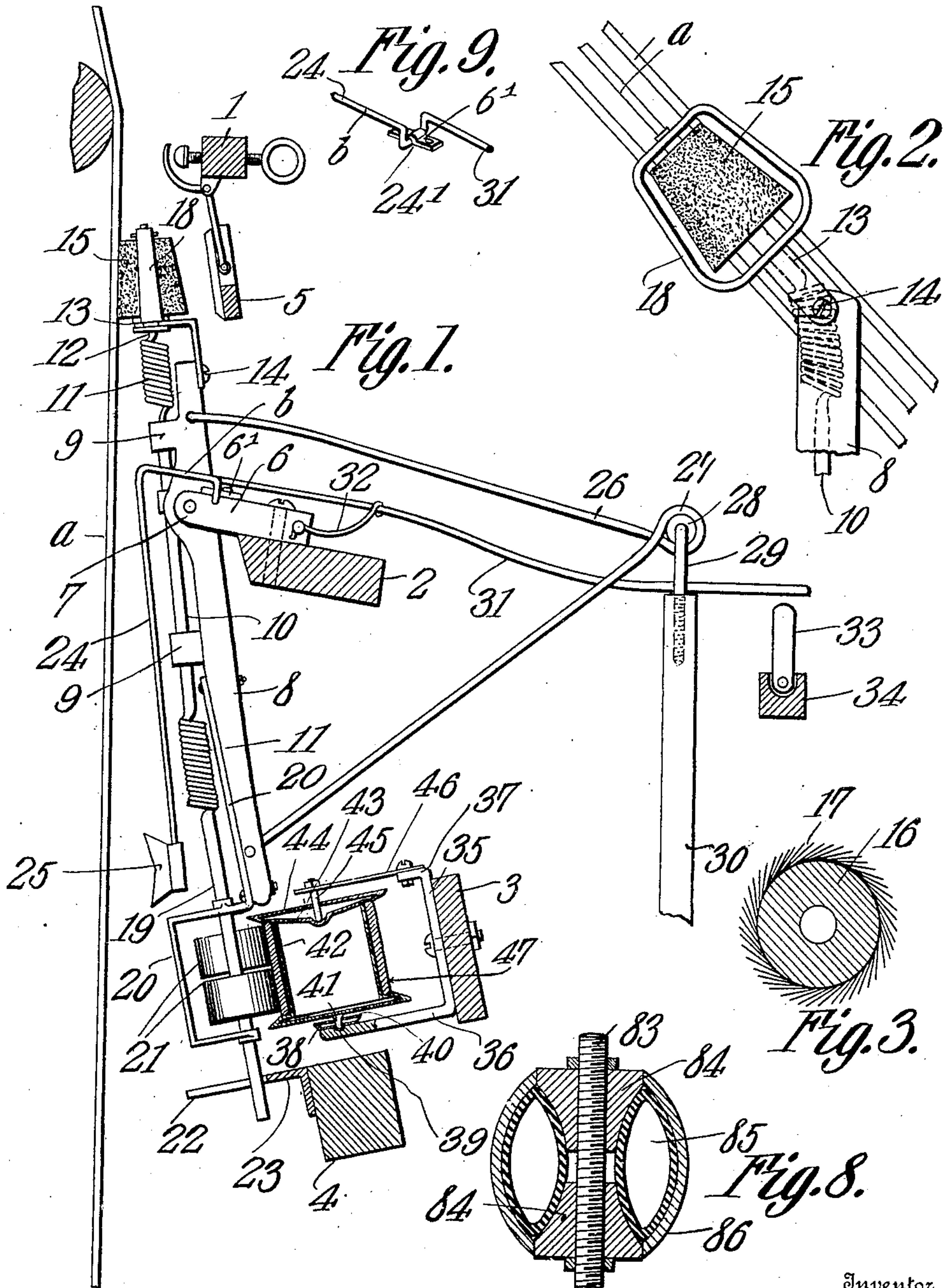


924,706.

Patented June 15, 1909.

3 SHEETS—SHEET 1.



Witnesses

*E. H. Hunt*  
*Herbert D. Lawson*

Inventor

*James L. Warner.*

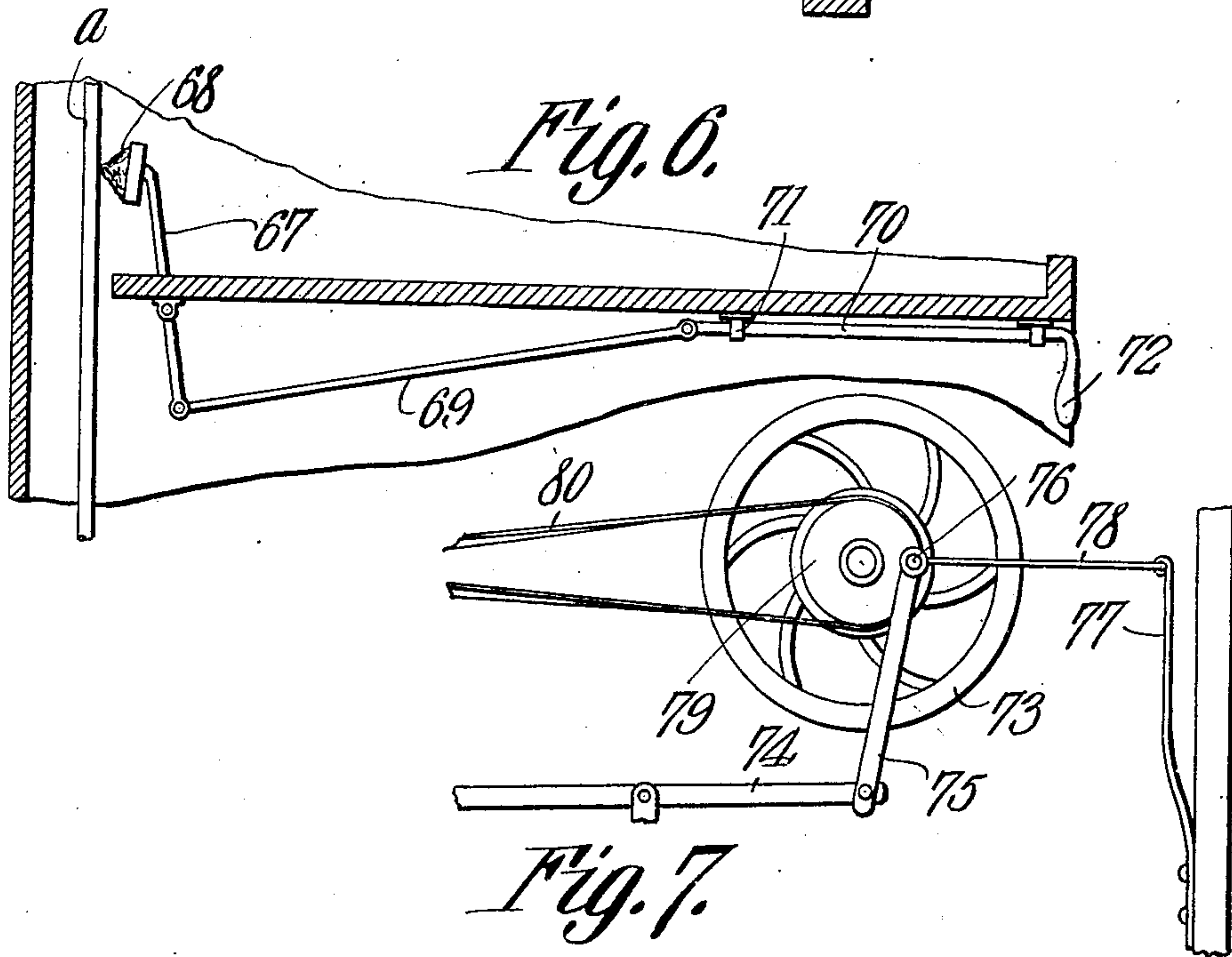
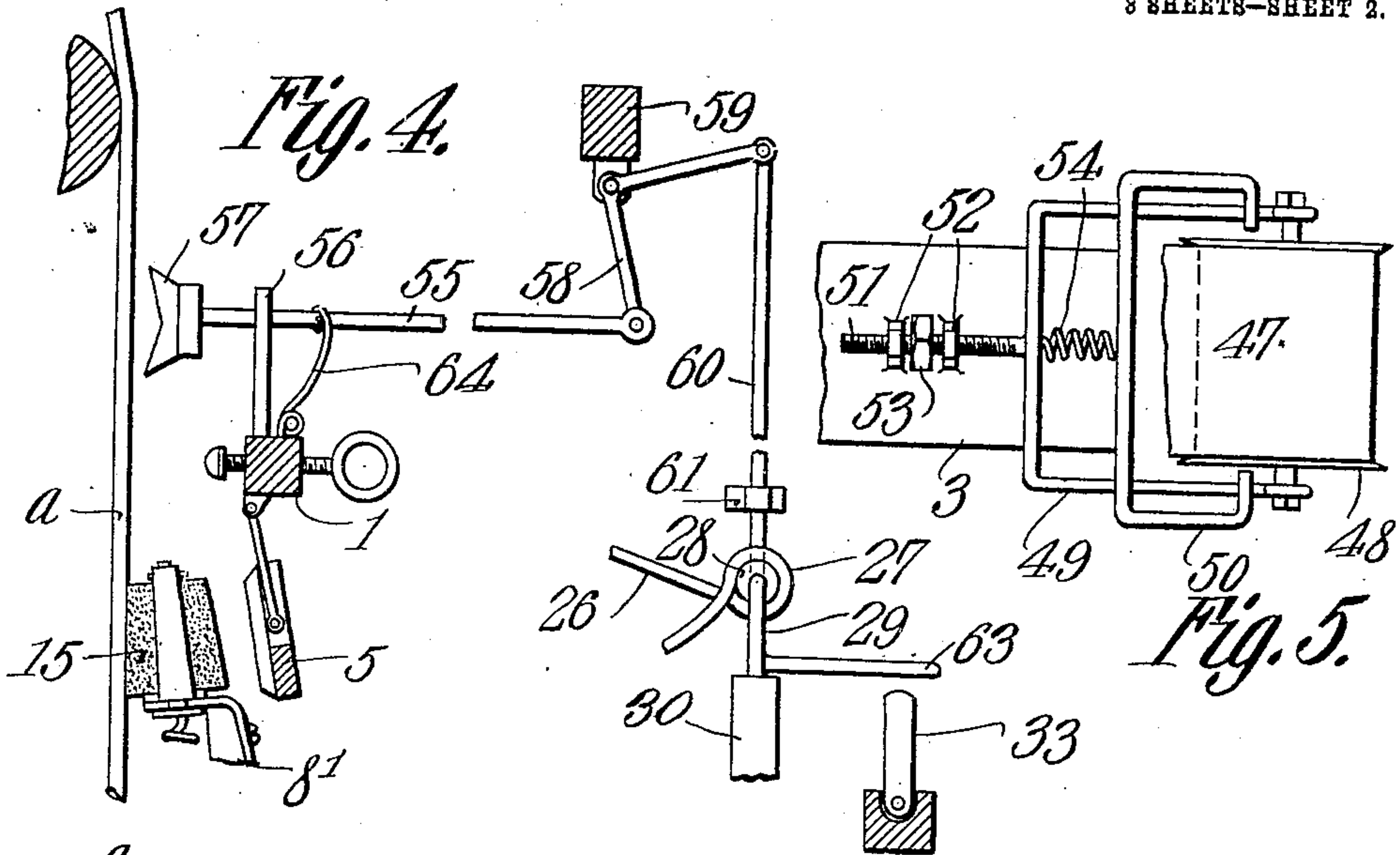
By

*C. A. Snow & Co.*

Attorneys

924,706.

Patented June 15, 1909.  
8 SHEETS—SHEET 2.



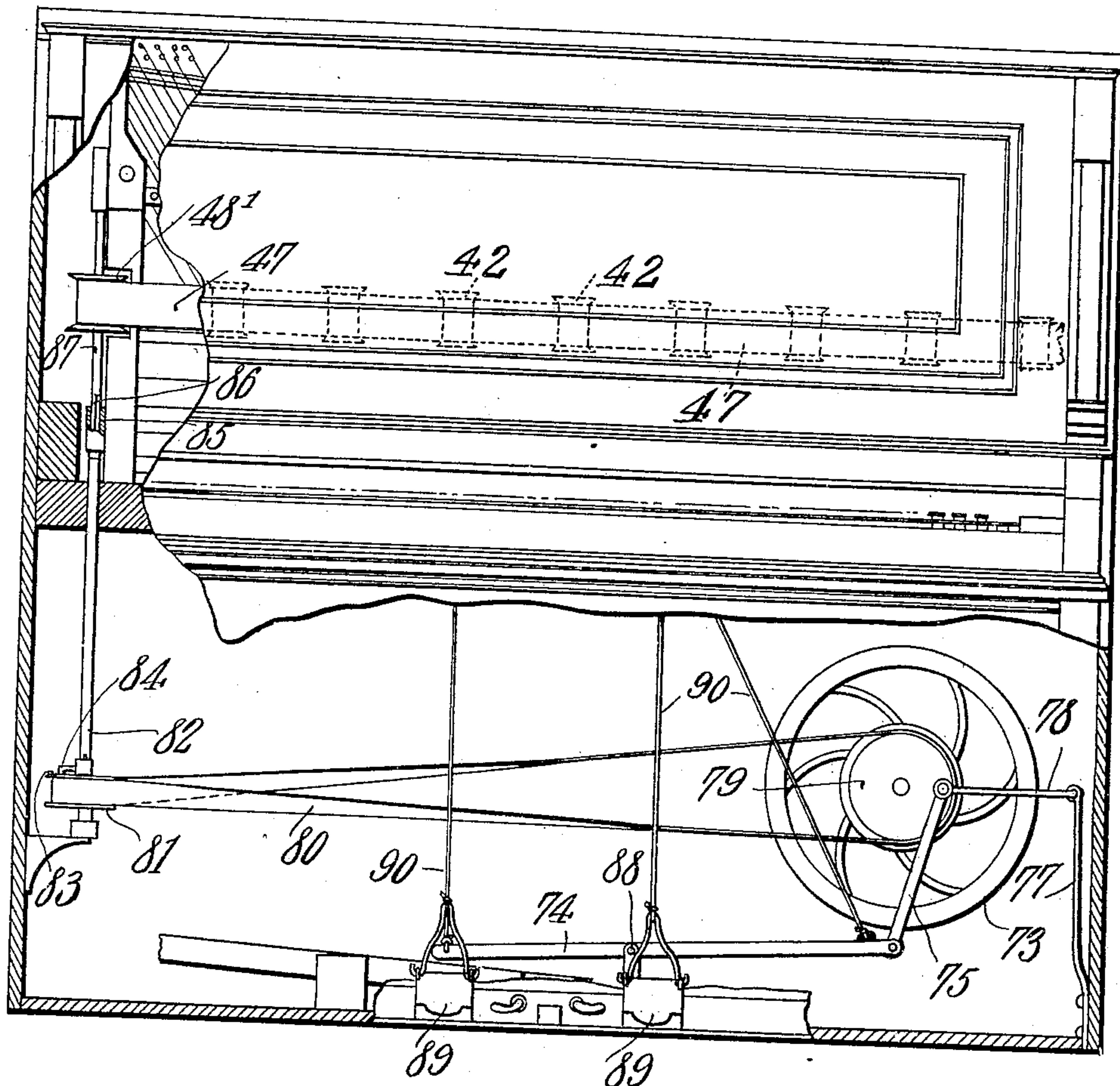
Witnesses  
*E. J. Stewart*  
*Robert S. Lawson*

Inventor  
*James L. Warner.*  
By *Chas. Snow*  
Attorneys



924,706.

*Fig. 10.*



E. J. Stewart  
Herbert D. Lawson

*James L. Warner.* Inventor

By *Chas. Snow & Co.*  
Attorneys



# UNITED STATES PATENT OFFICE.

JAMES LUCK WARNER, OF GIRARD, KANSAS.

## VIOLIN-PIANO.

No. 924,706.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed June 5, 1908. Serial No. 436,919.

*To all whom it may concern:*

Be it known that I, JAMES LUCK WARNER, a citizen of the United States, residing at Girard, in the county of Crawford and State of Kansas, have invented a new and useful Violin-Piano, of which the following is a specification.

This invention relates to violin pianos and is more especially designed as an improvement upon the violin piano described and claimed in Patent No. 870,702 issued to me on Nov. 12, 1907.

The object of the invention is to provide a vibrator of novel form for operating upon the strings of a piano to produce the desired tones.

Another object is to provide means whereby the spools of the vibrator-actuating belt can be kept thoroughly lubricated, thus eliminating any objectionable sounds which might otherwise be produced thereby while the instrument is being played upon.

Another object is to provide improved means for maintaining said belt taut.

A further object is to provide a vibrator carrying frame which is of novel form, said frame having means whereby the vibrator can be adjusted laterally to any desired angle to the vertical in order that the same may be adapted for use upon strings arranged at different angles.

A further object is to provide an improved damper actuating means for use upon the bass strings of the instrument.

Other objects are to provide means for preventing the fly wheel of the driving mechanism from stopping at a dead center, and for providing a simple form of harmonic stop.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a view partly in section and partly in elevation through a portion of a piano and showing certain of the present improvements, the vibrator being shown in contact with the string in rear thereof. Fig. 2 is a front elevation of the upper portion of the frame and the vibrator thereon, said vibrator being shown adjusted to position at an angle to the frame. Fig. 3 is a transverse section through a vibrator. Fig. 4 is a view partly in elevation and partly in

section of mechanism for actuating the damper used upon the lower or bass strings of the instrument. Fig. 5 is an elevation of a portion of the belt and the means utilized for tightening the same. Fig. 6 is a section through a portion of the piano and showing the harmonic stop in elevation. Fig. 7 is an elevation of the fly wheel and the means utilized for preventing the same from stopping at a dead center. Fig. 8 is a section through a modified form of vibrator. Fig. 9 is a detail view of the pivot portion of the damper rod shown in Fig. 1. Fig. 10 is a front elevation of a piano with parts broken away to show the motor and its connection with the vibrator actuating belt.

Referring to the figures by characters of reference, 1, 2, 3, and 4 designate transversely extending rails, the upper rail 1 having a suitable holder 5 suspended therefrom for supporting a cake of resin in front of each of the vibrators. The rail 2 has a flange 6 fastened to it and pivotally mounted between the ears 7 of this flange is a bar 8 preferably of wood and having outstanding ears 9 in which is journaled the vibrator-actuating shaft 10. This shaft has a flexible portion 11 adjacent each end and the upper terminal 12 of said shaft projects from this flexible portion and is journaled in a spring bracket 13 angular or L-shaped in form and pivotally mounted on the upper end of the bar 8, there being suitable means such as a screw 14 for securing the bracket 13 at any desired angle relative to the bar 8. The vibrator 15 is secured to this upper portion 12 of the shaft and as shown particularly in Fig. 3 consists preferably of a frusto-conical core 16 having tangentially arranged hairs 17 upon the curved or peripheral portion thereof, said hairs being disposed to exert a wiping action upon the strings *a* of the instrument when the vibrator is rotated. This vibrator is mounted in a metallic loop 18 carried by the bracket 13. It is of course to be understood that when the vibrator is used upon vertical strings it is not necessary to provide bracket 13 and instead the bar 8 can be extended back of the section 12 so as to constitute a bearing therefor. This arrangement has been shown at 8' in Fig. 4.

That portion of shaft 10 which extends downward below the lower flexible portion 11 thereof has been indicated at 19 and is journaled in a yoke-like bracket 20 secured to and extending downward from the bar 8.



A roller 21 is fastened to this portion 19 of the shaft and within the bracket, and the rollers of adjoining shafts are designed to be placed in staggered relation and to lap. In Fig. 1 some of the rollers of adjoining shafts have been indicated in elevation, although only one of the shafts is shown. The lower terminal portion of the shaft is movably mounted within a slot 22 formed in an angular strip 23 which is fastened to, and extends rearwardly from the lower rail 4.

A rod *b* extends over the flange 6 and rail 3, and, as shown in Fig. 9, is provided at an intermediate point with a laterally offset depending bearing portion 24' which is substantially U-shaped and bears upon the flange 6, said bearing portion being retained in place in any suitable manner as by means of a holding plate 6'. That portion of the rod in rear of the bearing portion forms an L-shaped arm 24, which extends downward between shaft 10 and the strings *a* and has a damper 25 at its lower end. The other end portion of the rod *b* extends forwardly to form an arm 31 located in position above a lifting rail 33 which is hingedly connected to a supporting rail 34 and is designed to be swung upwardly by the forte pedal of the piano. This arm 31 extends directly above the abstract 30 to the upper end of which is adjustably connected a threaded stem 29 having a bearing pin 28 at its upper end. This bearing pin rests within an eye 27 formed at the angle portion of a substantially V-shaped frame 26 which extends forward from the bar 8. The terminals of this frame 26, which is preferably formed of stiff wire, project into and engage the bar 8 adjacent the upper and lower ends thereof respectively. A spring 32 is connected to arm 31 and also to the flange 6 and serves to draw said arm 31 downward and thus hold the damper 25 normally pressed against the strings *a*. When the abstract 30 is raised it lifts the arm 31 against the stress of spring 32 and thus swings the damper 25 forward away from the strings *a*. By swinging the lifting rail 33 into position indicated in Fig. 1 it will act as a stop to prevent the damper from returning to the strings when the abstract is lowered.

The rail 3 has a plurality of brackets 35 fastened to it. Each bracket has a long lower arm 36 extending therefrom and a short upper arm 37. The lower arm has a cup 38 thereon having a socket 39 in the bottom thereof. A cap plate 40 extends from the cup and has a central opening designed to receive a lug 41 extending downward from the center of one end of a spool 42. The other end of this spool is concavo-convex as indicated at 43 and has a socket in the center thereof while a cap plate 44 extends over said end and has a central opening designed to receive a bearing pin 45. This pin is se-

cured to a spring strip 46 extending from the arm 37. This strip serves to hold the pin 45 normally seated in the socket in the end 43 of the spool and to force the lug 41 into its socket 39. Wear upon the bearings is thus taken up automatically and the spaces within the cup 38 and the upper end of the spool may be filled with a suitable lubricant so as to insure a smooth running spool.

The belt 47 utilized for driving the rollers 21 is mounted upon a plurality of spools 42 mounted on rail 3, as indicated by dotted lines in Fig. 10 and on end spools 48 and 48' one of which, 48, is mounted in a yoke 49 slidably mounted in a bracket 50 attached to the rail 3. A screw threaded stem 51 extends from the yoke and is slidably mounted in ears 52 arranged upon the rail, there being a nut 53 upon the stem and between these ears whereby said stem may be shifted longitudinally to move the spool 48 in either direction. A spring 54 is interposed between yoke 49 and bracket 50 so as to exert a yielding pull upon the yoke. Obviously by turning the nut 53 upon the stem the belt 47 can be readily adjusted.

As shown in Fig. 4 a form of damper different from that heretofore described may be used, the same being particularly designed for use in connection with the long or bass strings of the instrument. This damper consists of a rod 55 slidably mounted in a flange 56 extending from the rail 1, there being a damper head 57 at one end of the arm while the other end of said arm is connected to a bell crank lever 58 mounted on an additional or supplemental rail 59. A rod 60 extends downward from the bell crank lever 58 and through a suitable guide 61 the lower end of this rod being designed to be actuated by the abstract 30 and having a laterally extending finger 63 designed to be limited in its downward movement by rail 33. A spring 64 is preferably secured to rail 5 and the rod 55 so as to hold said rod normally pressed toward the strings *a*. Obviously when the abstract 30 is raised the damper 57 will be moved away from the strings and against the stress of the spring 64. Said spring will promptly return the parts to their initial positions when the abstract is lowered.

In Fig. 6 one of the details of the invention has been shown, the same consisting of a harmonic stop comprising a lever 67 having a damper 68 at one end and designed to touch the strings directly at the center thereof. The lower end of the lever has a rod 69 pivoted to it and to a draw bar 70 which is mounted in guides 71 depending from the key bed of the instrument, there being a handle 72 whereby this rod can be actuated for the purpose of shifting the damper 68 into or out of contact with the strings.

Another detail of the invention has been illustrated in Fig. 7, this being a simple de-



vice for preventing the fly wheel 73 of the driving mechanism from assuming a dead center. 74 designates the actuating lever which is connected by means of a pitman 75 with the wrist pin 76 of the wheel. A spring 77 is attached to the frame of the instrument and is connected by means of a link 78 with the wrist pin, thus maintaining said wrist pin normally in alinement with the center of the wheel and the end of the spring. There is no danger therefore of the wheel 73 stopping in a position where it cannot be readily started by the lever 74. A pulley 79 rotates with the wheel 73 and drives a belt 80 which in turn drives a small pulley 81 on a spindle 82. A ratchet 83 is preferably formed upon the pulley 81 and is normally engaged by a spring pawl 84 carried by the spindle 82. This spindle has an angular socket 85 in its upper end detachably engaged by the angular head 86 of an upper spindle 87 on which the spool 48' is secured. This construction is particularly desirable where a hair covered vibrator such as heretofore described is utilized. Obviously should the wheel 17 be initially driven in the wrong direction the pawl 84 would slip over the ratchet 83 and belt 47 would not therefore be actuated and the danger of the hairs of the vibrator becoming entangled within the strings as a result of rotating in the wrong direction would thus be eliminated. The actuating lever 74 is preferably fulcrumed at a point between its ends upon a bracket as indicated at 88 and driving pedals 89 are mounted in front of the piano and are connected to the two arms of lever 74 by means of wires or cables 90 which preferably extend upward to and over supporting sheaves not shown.

Upon some of the strings of the instrument particularly the bass strings, it is desirable to use a form of vibrator different from that heretofore described. This other form has been illustrated in Fig. 8 and consists of a screw threaded stem 83 having oppositely disposed cones 84 adjustably mounted thereon. An inflated flexible tube 85 extends around these cones and is provided with a fabric band 86 in which hair is preferably interwoven as shown by the dots in Fig. 8. Should it be desired at any time to further compress air within tube 31 it is merely necessary to screw cones 80 toward each other.

It will of course be understood that when the belt 47 is actuated by the mechanism provided therefor it will travel around the series of rollers 42 and 48 and in front of the staggered rollers 21. When any one of the abstracts 30 is lifted by one of the keys of the keyboard bar 8 is tilted so as to throw the roller 21 against the moving belt 47 thus causing shaft 10 to rotate. At the same time the vibrator 15 is shifted against the strings *a* and will produce a sound similar to

that produced by drawing a bow over the strings of a violin. By arranging the hairs 17 tangentially as shown in Fig. 3 the quality of tone produced is greatly improved because of the wiping action which they produce. Each time the abstract 30 is released and falls to its initial position the bar 8 swings downward so as to bring the damper 25 against the strings *a*. At the same time the vibrator 15 comes into contact with the resin in the holder 5. As heretofore stated where brackets 13 are arranged upon the bars 8 the vibrators can be adjusted to different angles relative to the bars so as to be properly applied to the inclined strings as indicated in Fig. 2.

When it is desired to sustain the tones and support the dampers out of contact with the strings it is merely necessary to swing the rail 33 into an upright position so as to limit the downward movement of the arms 31 or the fingers 63. By adjustably connecting the stems 29 to the abstracts 30 the pressure of the vibrators upon the strings can be regulated at will. Importance is also attached to the fact that the brackets 13 are formed of flat springs because they thus permit the vibrator to have a slight backward and forward movement when shifted relatively to the strings. It is designed to provide ball bearings for all parts of the motor.

What is claimed is:

1. In a violin piano the combination with a pivoted bar; of a shaft journaled upon the bar, means for rotating the shaft, and a vibrator secured to and revoluble with the shaft, said vibrator comprising a core and tangentially arranged hairs upon the periphery of the core.

2. The combination with a pivotally supported bar and a revoluble vibrator carried thereby; of an abstract for actuating the bar, a bell crank lever, means for positively connecting said lever and the abstract, a damper attached to and actuated by the lever, elastic means for holding the damper and lever normally in a predetermined position, and means for holding the damper out of contact with the strings.

3. In a violin piano the combination with a non-flexible pivoted bar, and a revoluble vibrator carried thereby; of a one-piece V-shaped frame secured at its terminals to the end portions of the bar and having an integral eye at the apex thereof, an abstract, and a pin carried by the abstract and seated within the eye.

4. In a violin piano a vibrator comprising a screw threaded stem, oppositely disposed cones mounted thereon, an inflated ring upon the cones, and a separate covering surrounding the ring.

5. In a violin piano a vibrator comprising a stem, an inflated ring surrounding the same, means adjustably mounted upon the



stem for compressing air within the ring, and a covering surrounding said ring separate therefrom.

5 6. In a violin-piano the combination with a string; of an inflatable vibrator shiftable into contact with the string, and means for rotating the vibrator.

10 7. In a violin-piano the combination with a string; of an inflatable vibrator body, a covering thereon, means for shifting the vibrator covering into contact with the string, and means for rotating the vibrator.

15 8. In a violin-piano a vibrator comprising a threaded stem, oppositely disposed cones mounted thereon, an inflated ring surrounding and mounted on the cones, said cones being separately revoluble upon the stem to compress the ring, and a separate vibrator covering mounted on the ring.

9. In a violin-piano the combination with 20 a pivotally supported bar and a revoluble vibrator carried thereby; of an abstract, means operated by the abstract for shifting the bar, a rod pivotally supported adjacent the bar and having an arm at one end there- 25 of, a damper carried by the arm and elastic means engaging the other end portion of the rod for holding the damper normally in a predetermined position, said rod being disposed in the path of and designed to be ac- 30 tuated by the abstract.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES LUCK WARNER.

Witnesses:

JOHN M. VINCENT,

WILL H. JONES.