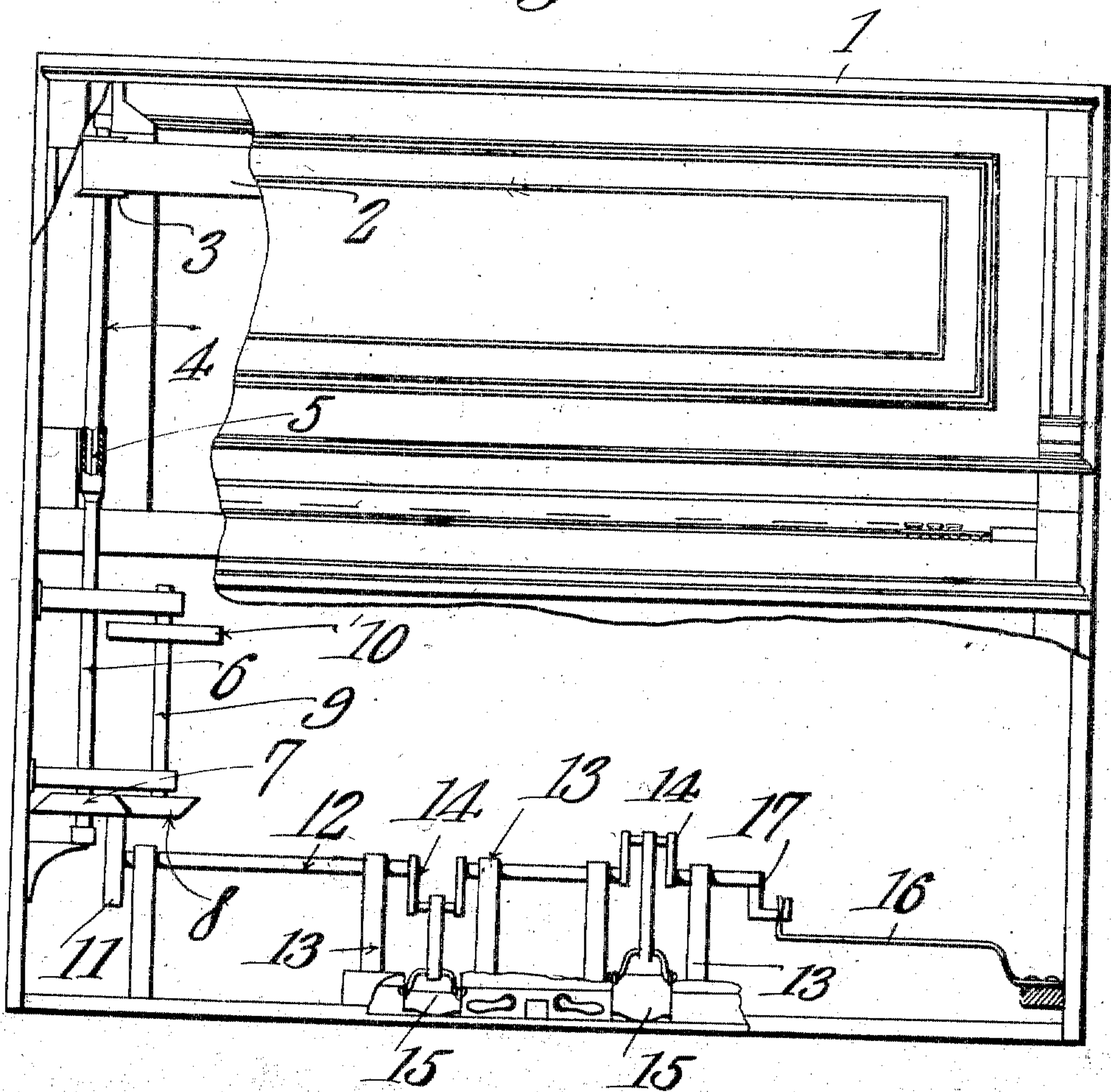


983,012.

J. L. WARNER.
VIOLIN PIANO.
APPLICATION FILED JAN. 3, 1910.

Patented Jan. 31, 1911.
4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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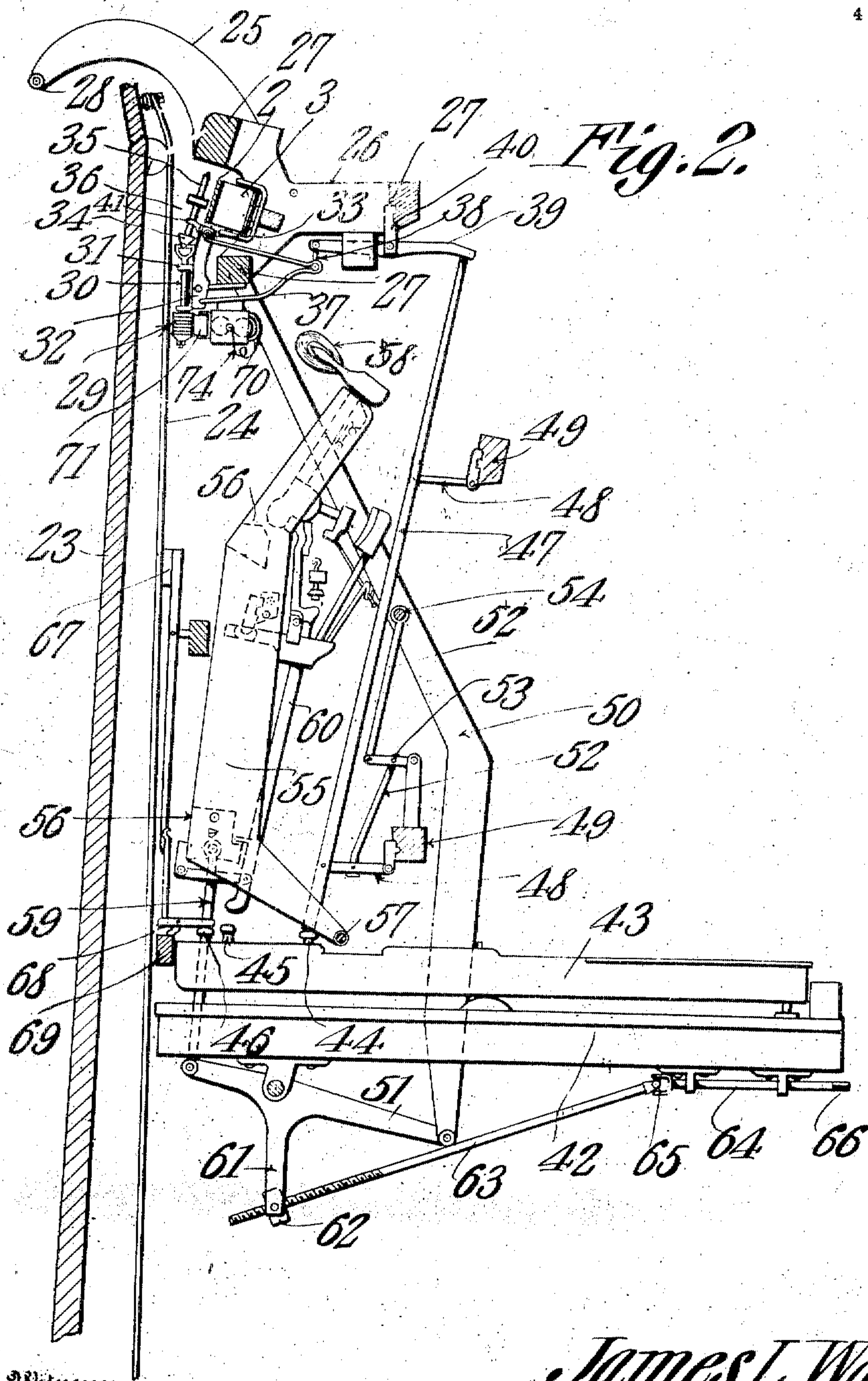
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983.012.

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4 SHEETS—SHEET 2.



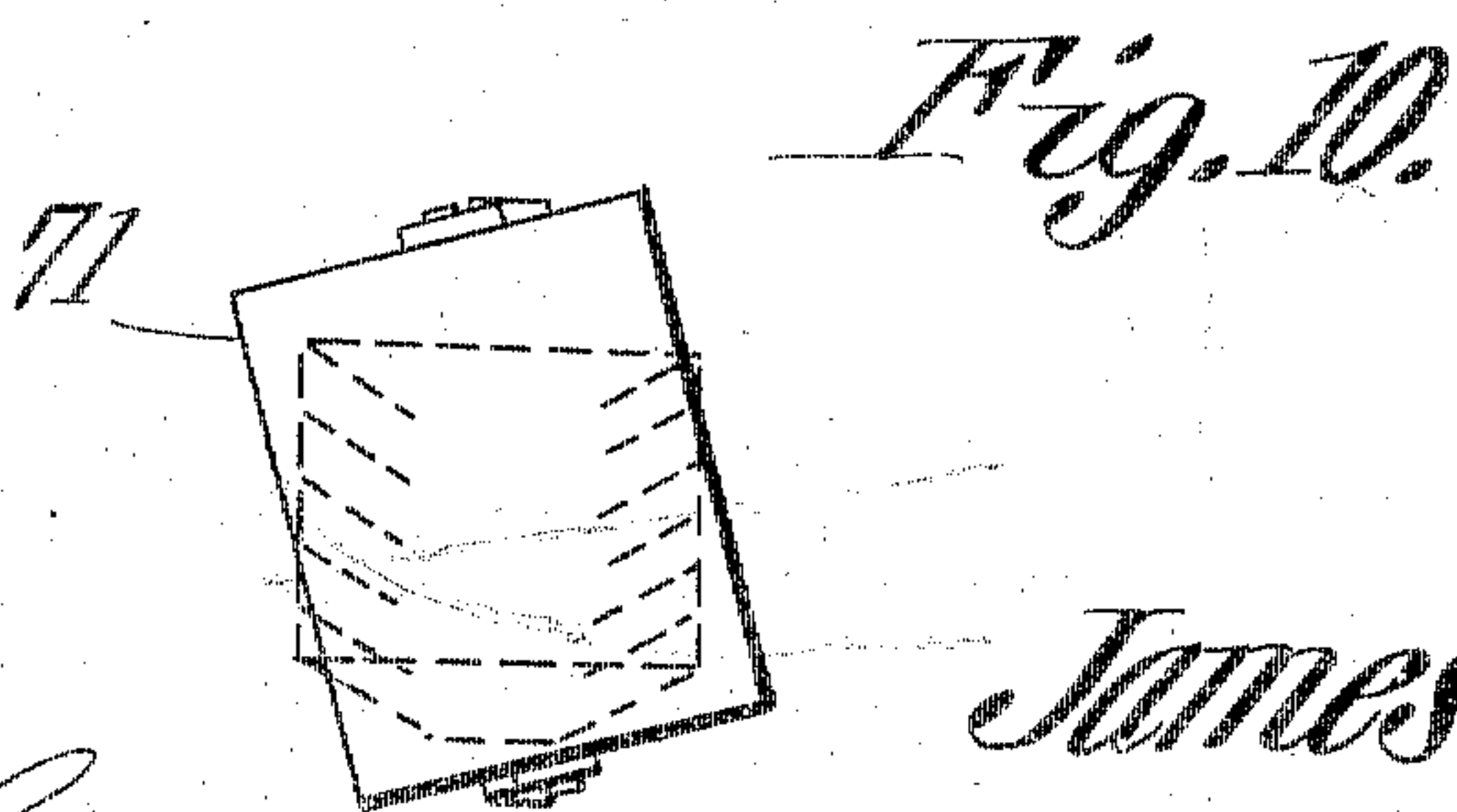
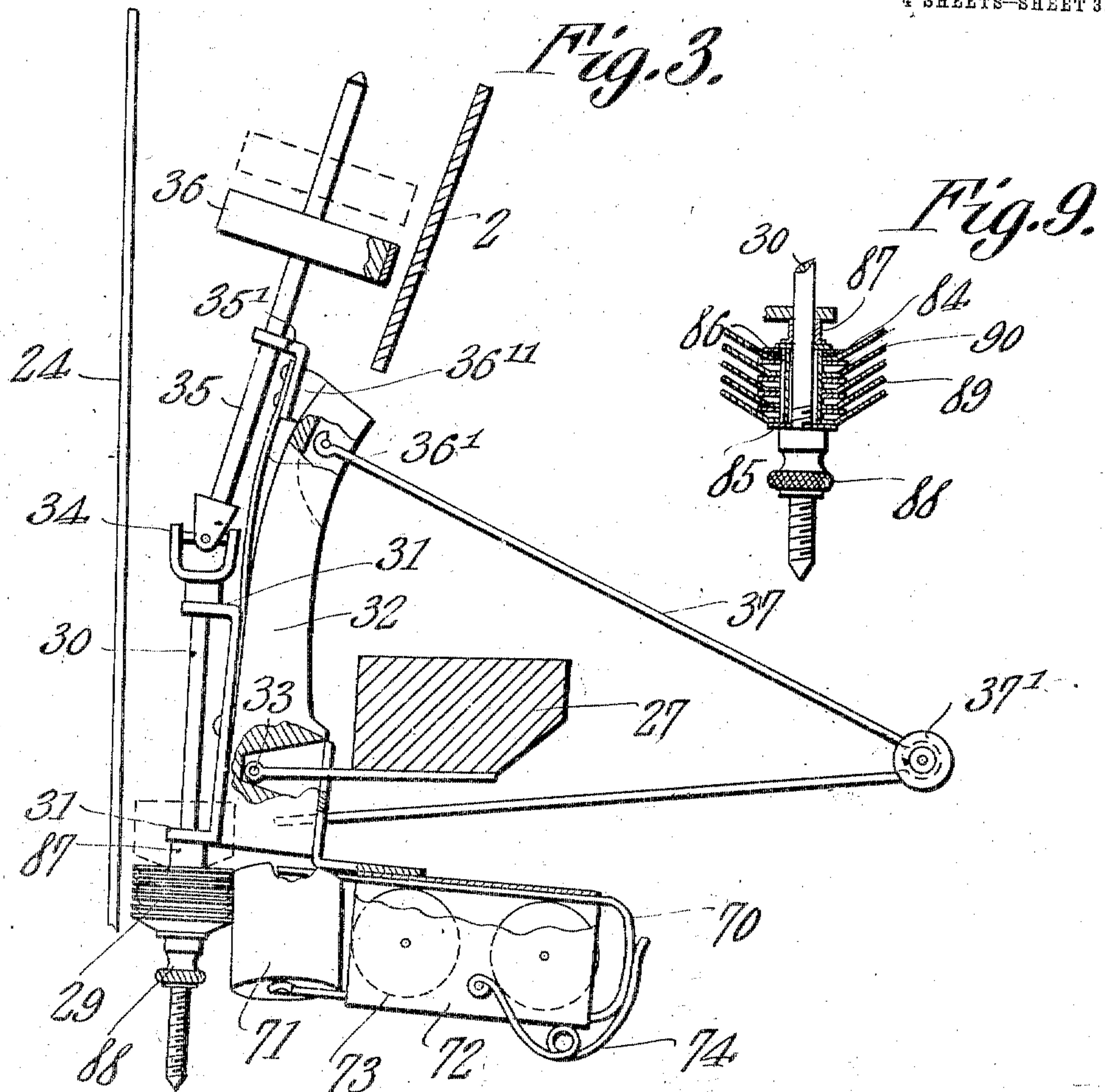
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983,012.

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Patented Jan. 31, 1911.
4 SHEETS-SHEET 4.

Fig. 4.

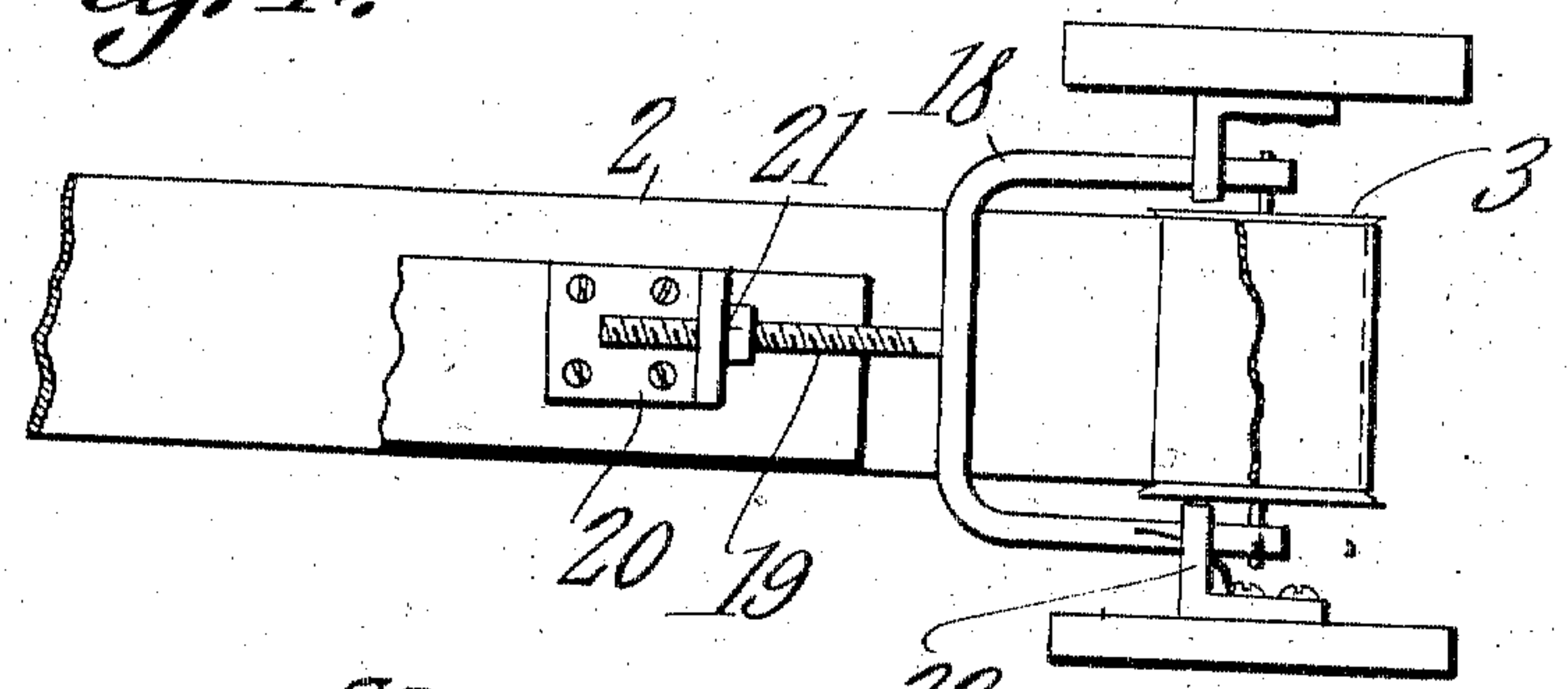


Fig. 5.

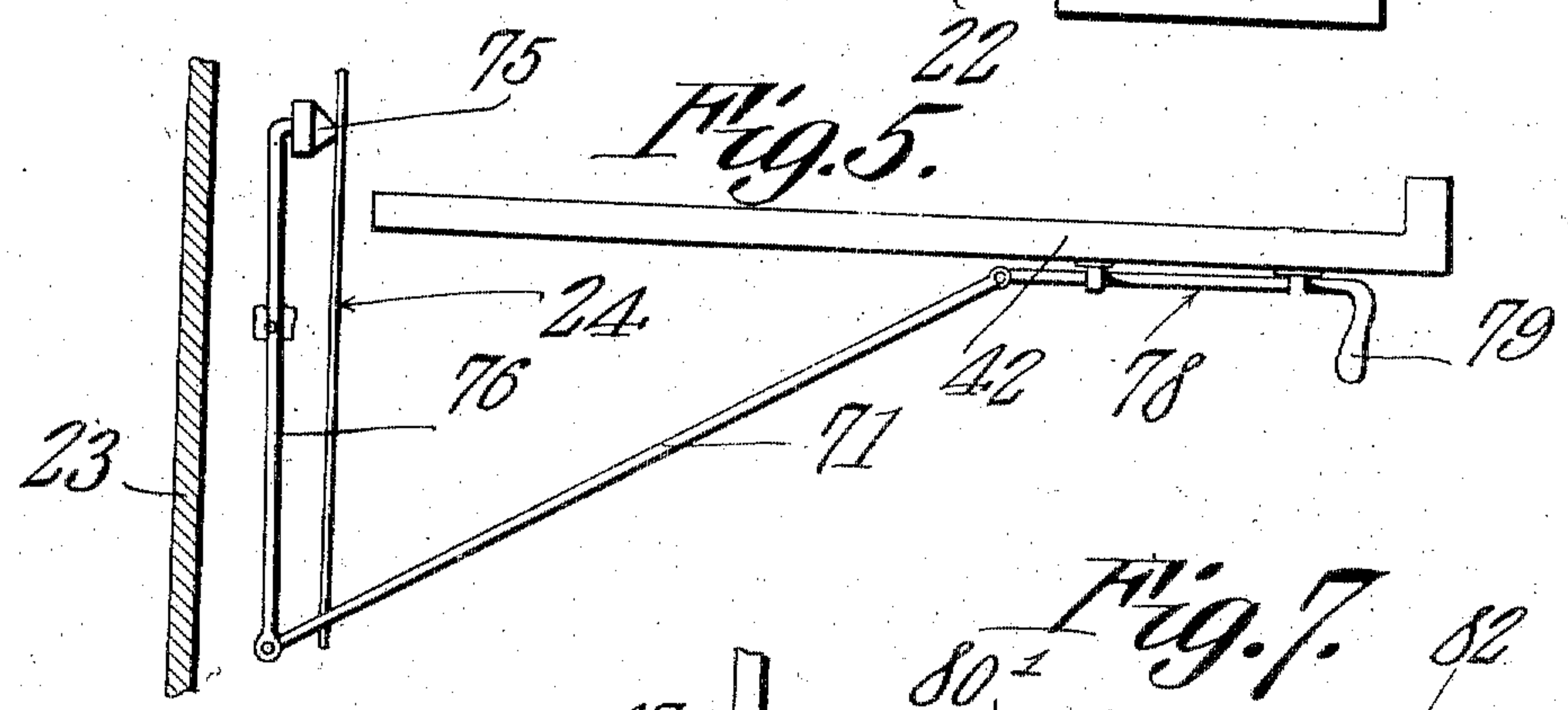


Fig. 6.

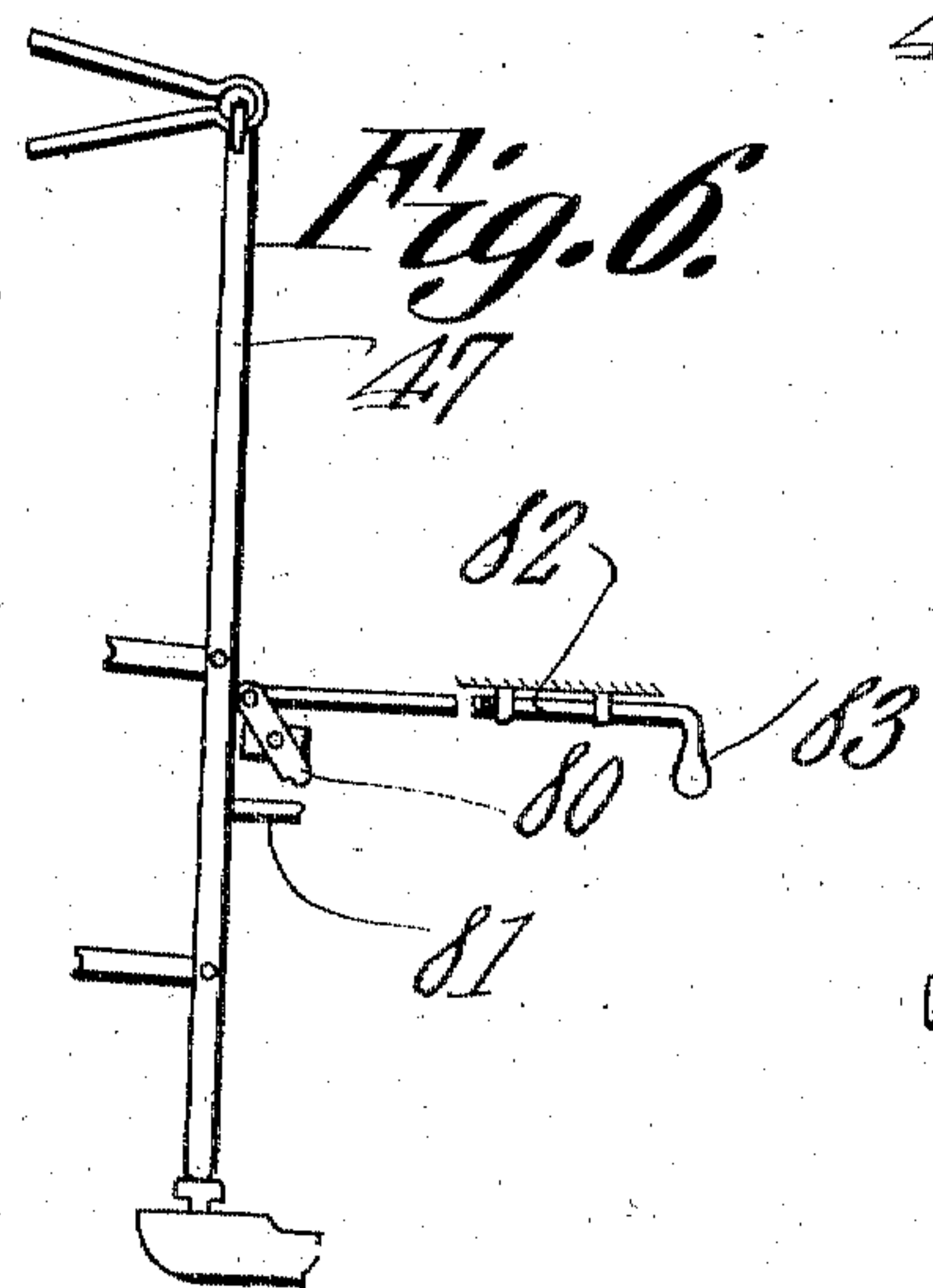


Fig. 7.

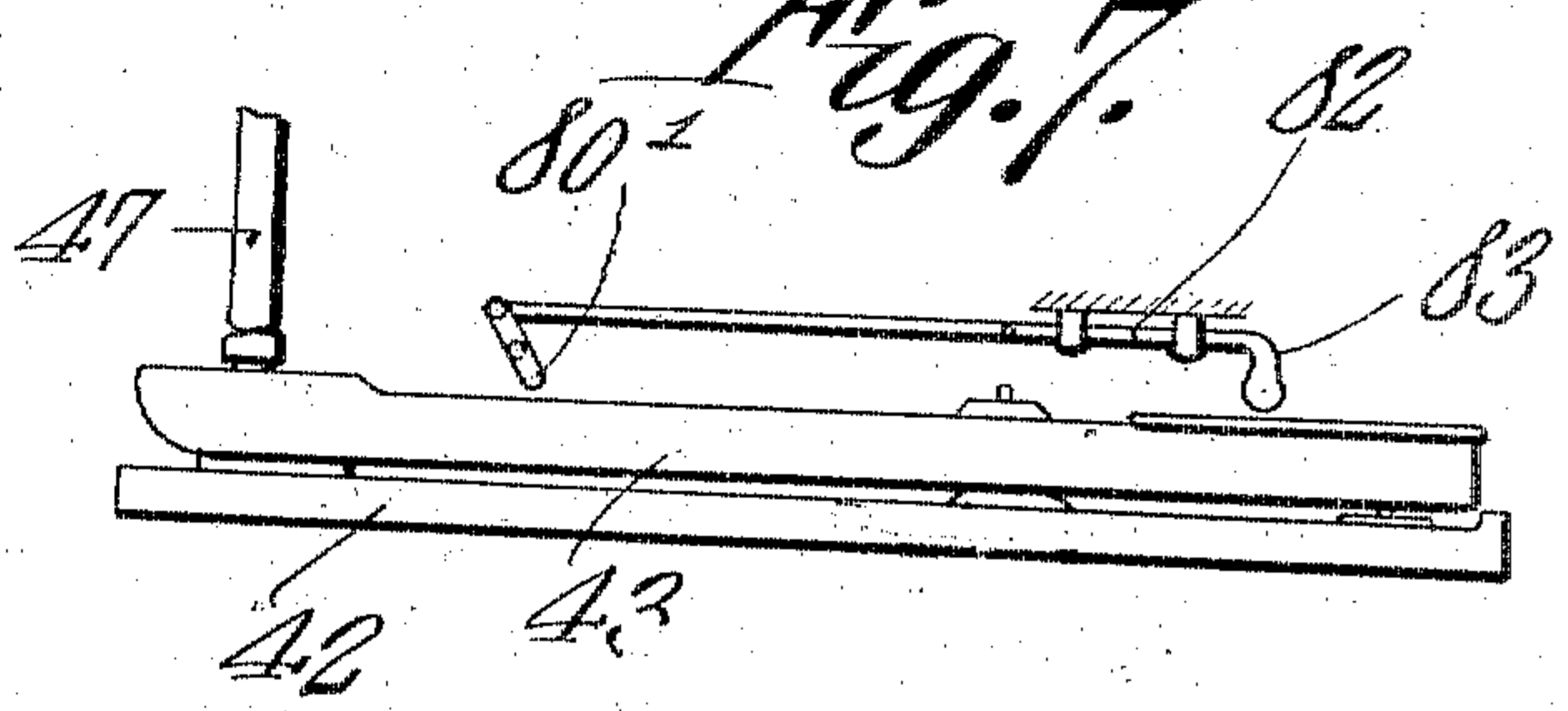
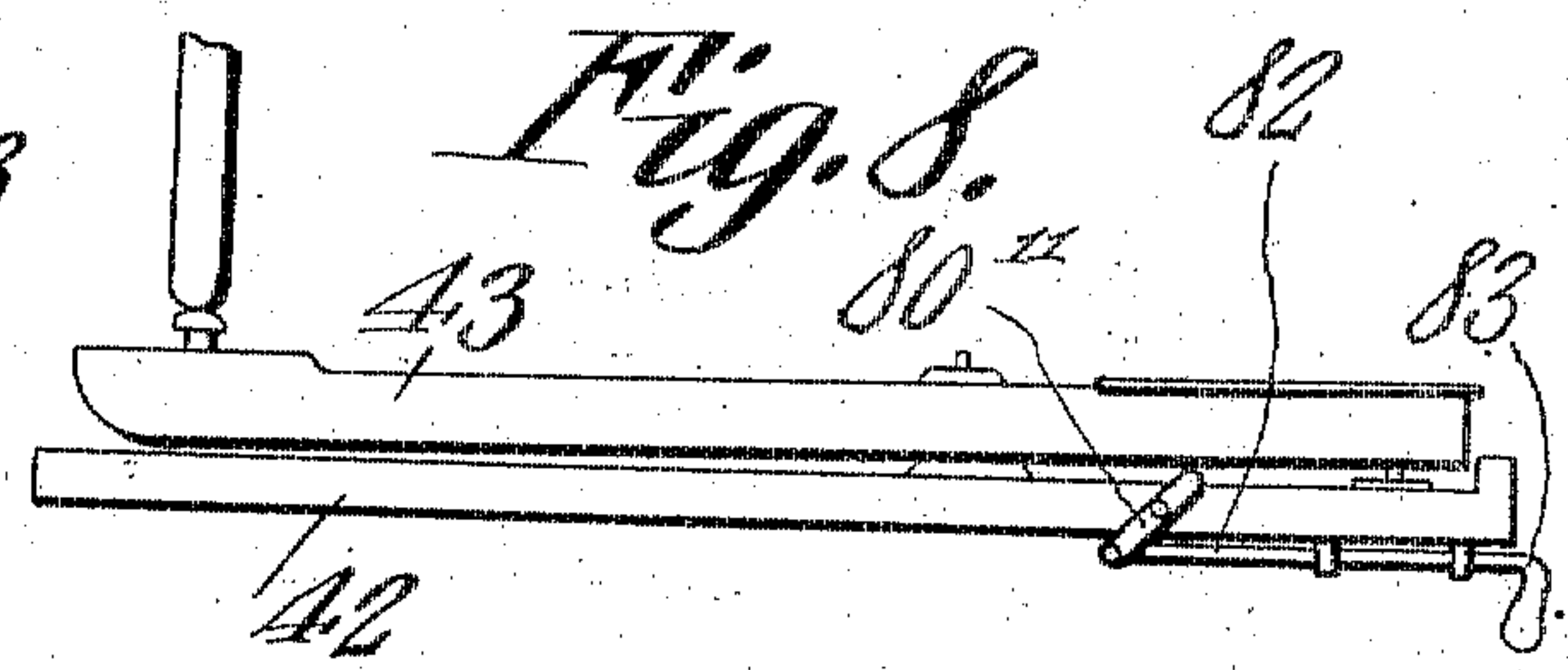


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

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VIOLIN-PIANO.

983,012.

Specification of Letters Patent.

Patented Jan. 31, 1911.

Application filed January 3, 1910. Serial No. 535,937.

To all whom it may concern:

Be it known that I, JAMES L. WARNER, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented a new and useful Violin-Piano, of which the following is a specification.

This invention has reference to improvements in violin pianos and its object is to provide a means whereby the same set of strings may be used for violin and piano effects, that is the strings may be set in vibration by bowing devices to produce violin effects, or they may be set in vibration by the impact of the hammers of a piano action.

In accordance with the present invention, there is provided a set of strings such as is commonly used in the pianoforte and there is also provided an ordinary piano action, except that the mounting for the piano action may be such that it can be displaced relative to the strings sufficiently to throw it entirely out of action so that the piano key may be operated without actuating the hammers. There is also provided a bowing action for violin effects which may also be arranged so as to be moved into and out of operative relation, as a whole, with the strings, and the bowing heads of the bowing action are under the control of the ordinary piano keys so as to be brought at the will of the operator, into engagement with the same strings that corresponding hammers of the piano action may be caused to strike.

In addition to the foregoing the invention also comprises a number of novel features which together with the main features of the invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings—

Figure 1 is a front elevation of a piano structure illustrating more particularly the impelling means for the bowing heads. Fig. 2 is an end elevation of the piano and violin action showing the arrangement of the parts whereby either action may be brought into operation at will. Fig. 3 is a detail view, on an enlarged scale of the bowing mechanism used for each string. Fig. 4 is a detail view of a tension device for the actuating belt for the bowing heads. Figs. 5 to 8 are views of different arrangements of tone-modifying devices. Fig. 9 is a section

through a bowing head. Fig. 10 is a view illustrating the relation of the rosin block to the bowing head.

Referring to the drawings and first more particularly to Fig. 1 there is shown a casing 1 which may be similar in most respects to an ordinary piano casing, preferably of the upright type although the invention is not confined necessarily to use with an upright piano. Mounted in the casing, and in the particular structure shown in Fig. 1, near the upper end of the casing there is a belt 2 constituting the driving belt for bowing heads to be hereinafter described. This belt is an endless belt and is mounted at the ends upon rollers 3, one only of which is shown in Fig. 1 and the roller there shown has an elongated spindle 4 connected at one end by a coupling 5 to the corresponding end of a shaft 6 suitably journaled in bearings carried by the casing and this shaft near the end remote from the coupling 5 carries a bevel wheel 7 bearing against a like bevel wheel 8 on an independent shaft 9 carrying a balance wheel 10, the shaft 9 being also journaled in proper bearings carried by the casing in parallel relation with the shaft 6.

Bearing against the under face of the wheel 7 is a friction wheel 11 on one end of a crank shaft 12 mounted in suitable bearings 13 in the lower part of the casing 1, and the cranks 14 of the shaft 12 are connected to suitable pedals 15 extending to the front of the casing in accessible position to be engaged by the feet of the operator. There is provided a spring 16 connected at one end to a fixed point of the casing and at the other end to a crank 17 on the end of the shaft 12 remote from the wheel 11, so that this spring will always tend to stop the rotation of the shaft 12 in a position where the pedals 15 will be so related to the shaft 12 that the operator may readily start the shaft since the spring 16 prevents it from stopping on a dead center.

The operator has but to actuate the pedals 15 in the same manner as the pedals of an organ are actuated to impart rotative movement to the shaft 6 through the friction wheels 7 and 11, and by the shaft 6 to the spindle 4 and so ultimately to the belt 2, regular movement of the belt 2 being insured by the fly wheel 10 receiving motion

from the crank shaft through the connecting wheels 7 and 8 which latter, because of the absence of noise are preferably of the friction type. Of course the speed of the belt 2 depends upon the speed of the actuation of the pedals 15, and the belt 2 may be driven rapidly or slowly at the will of the operator, but the movement of the belt whether fast or slow will be regular because of the fly wheel 10.

Of course other means of driving the belt may be employed, the same as in organ structures where water or electric motors are commonly used for the purpose and therefore the pedal movement illustrated is to be taken as indicative of any suitable motive power whether manual, mechanical, pneumatic or electrical.

In order to maintain the belt 2 in a taut condition, the structure shown in Fig. 4 may be employed. The roller 3 remote from the driving roller is mounted in the ends of a yoke 18 provided with a screw 19 projecting from its connecting members and this screw may be sustained by a bracket 20 to which the screw is secured in any adjusted position by a lock nut 21, and the bracket may be made fast to any suitable fixed portion of the casing or to some fixed member within the casing. The legs of the yoke 18 are guided in brackets 22 also made fast to some fixed member within the casing.

Referring to Fig. 2 there is shown a sounding board 23 and a single string 24 and this showing may be taken as indicative of the sounding board and strings of a pianoforte. Above the sounding board and near each end of the casing there is pivotally mounted an arm 25 on a pivot 28, the two arms each carrying a bracket 26 supporting a number of longitudinally disposed rails 27 designed to sustain the operating mechanism for the violin side of the structure. In the particular structure shown in Fig. 2 the rollers 3 may be supported by the brackets 26 instead of upon fixed portions of the interior mechanism of the instrument so that the belt 2 will participate in the movement of the brackets 26 around the pivots 28 of the arms 25.

It will be observed in the showing in Fig. 1 that the coupling or connection 5 between the spindle 4 and shaft 6 is such as to permit a longitudinal movement of the spindle 4 in the coupling without disconnecting the parts and this will permit an appropriate movement of the rollers 3 with the bracket 26, the whole structure being quite flexible in this respect.

There is shown a bowing head 29 which, as will hereinafter appear, may be moved into and out of engagement with the string 24. There is but one bowing head shown in the drawings, but it will be understood that there is a bowing head provided for each

string and all the bowing heads are carried by the brackets 26 and rails 27 as a unitary structure.

Each bowing head 29 best shown in Figs. 3 and 9, is carried on one end of a shaft 30 in suitable bearings 31 carried by a lever 32, there being a lever 32 for each bowing head and its journaled support. The lever 32 may turn about a pivot 33 secured to the general supporting means made up of the bracket 26 and rails 27 so that the bowing heads 29 may be moved to and from the strings as desired.

Each shaft 30 is connected by a universal coupling 34 with another shaft 35 mounted in a suitable bearing 35' carried by the lever 32 and each shaft 35 is provided with a friction roller 36 movable into engagement with the adjacent run of the belt 2 when the lever 32 is moved in the proper direction about its pivot so that the rotary motion is imparted by the belt 2 to the shaft 35 and by the latter to the shaft 30 and ultimately to the bowing heads 29. Since the space between the adjacent shafts 35 is limited, the rollers 36 may be in staggered relation one to the other as indicated in dotted lines in Fig. 3.

The bowing head structure is in general the same as shown and described in Letters Patent #924,706, granted June 15, 1909, for a violin piano, on an application filed by me, but the structure differs in some respects from that shown in the aforesaid Letters Patent and these differences will be pointed out in due course. Each lever 32 has secured thereto a bracket 37 with divergent members secured to the lever near its pivot point and near the end remote therefrom, the connections being on opposite sides of the pivot 33. The free end of the bracket 37 carries an eye 37' receiving one end of a link 38 connecting the bracket 37 with one end of a rock lever 39 mounted on a flange 40 carried by one of the rails 27.

The bearing 35' for the shaft 35 is carried by one end of a leaf spring 36' fast at the other end to the lever 32, the bearing 35' being normally held against a buffer 36'' on the corresponding end of the lever 32. When the said lever 32 is moved about its pivot to bring the bowing head against the string, the roller 36 is brought against the belt 2 before the head 29 engages the string, thus setting the roller 36, shafts 35 and 30 and bowing head 29 into rotation. The spring 36' will yield to further movement of the lever 32 necessary to bring the bowing head into the desired engagement with the string.

The piano is of course provided with an appropriate key-bed and this is indicated at 42 in Fig. 2. A single key 43 only is shown mounted on the key-bed but this may be taken as indicative of the usual number of

keys which need not differ from the keys ordinarily employed in pianofortes.

Each key carries near its rear end a number of studs or screws 44, 45, and 46 respectively so that the relation of each key to certain parts actuated thereby may be readily adjusted when the instrument is first assembled or at subsequent times. Each key has in the path of the screw 44 in the particular adjustment of the parts shown in Fig. 2, a rod 47 carried by links 48 from flanges fast on rails 49 extending longitudinally of the structure. Each time the accessible end of a key 43 is depressed then the end carrying the screw 44 is elevated and the rod 47 engaging said screw participates in this movement, and the lever 39 in the path of the rod 47 under consideration is moved about its pivot in a direction to depress the end connected to the link 38 and this movement is participated in by the arm 37, thus causing the lever 32 to rock on its pivot in a direction to bring the head 29 into engagement with the string 24 first however bringing the roller 36 against the belt 2 and the head 29 being rotated the string 24 will be set in vibration by the blowing action of the head 29. The keys 43 are actuated by the performer in the same manner as is a piano or organ with the result that a violin quality is produced by the action of the bowing heads on the strings.

Within the casing 1 near each end thereof is an arm 50 connected at one end to a corresponding bracket 26 and at the other end to one end of a rock lever lever 51 pivotally supported on some fixed portion of the instrument, say the support 42 for the keys 43. When the lever 51 is moved in one direction then the motion is transmitted through the arms 50 to the brackets 26 and the latter are moved about the pivot points 28 of the arms 25, and if the direction of movement of the lever 51 be such as to elevate the arms 50 then the brackets 26 are moved upwardly about the pivot 28 as a center and the heads 29 are moved away from their normal position and the levers 39 would also be moved away from the rods 47 were it not for a connecting structure comprising links 52 and an intermediate lever 53. One link 52 is connected at one end to a rod 54 extending between the arms 50 and at the other end this link 52 is connected to the intermediate lever 53 mounted on a suitable support rising from one of the rails 49. The other link 52 extends from the lever 53 to the link 48 connecting each rod 47 to one of the rails 49, this rail being the same rail which supports the lever 53. By this arrangement all the rods 47 are lifted out of the paths of the screws 44 on the several keys 43 at the same time that the bowing heads 29 are moved out of operative relation to the strings 24 so that on the depres-

sion of any one or more of the keys 43 the rods 47 will be no longer engaged by the keys and the bowing structure will remain inactive even though the keys 43 be actuated by the performer.

Near each end of the casing there is pivotally supported an arm 55 and these arms are connected together by appropriate rails 56, the pivot points of the arms being indicated at 57.

The frame made up of the arms 55 and rails 56 is designed to support a piano action which may be generally of the ordinary type and therefore requires no detail description. In Fig. 2 a single hammer head 58 is shown and this may be taken as indicative of all the hammers of an ordinary piano action, the hammers being designed to engage the strings 24 in the manner usual in pianofortes. The piano action frame made up of the arms 55 and the rails 56 is connected to the lever or levers 51 by a link or links 59, which latter are connected to the ends of the levers 51 remote from the arms 50 so that when the levers 51 are rocked on their pivots the violin action is moved out of operative relation to the strings as the piano action is moved into operative relation thereto and the piano action is moved out of operative relation to the strings when the violin action is moved into operative relation thereto. By this means the operator may utilize the improvement for violin effects or for piano effects at will. To rock the levers 51 and to hold them in adjusted positions, one or both levers 51 are provided with an arm 61 carrying at its free end a pivoted nut 62, into which there is screwed the threaded end of a rod 63 leading to a shaft 64 to which it is connected by a universal joint 65 and this shaft 64 is carried to a point where the end 66 remote from the coupling 65 is accessible to the operator. This accessible end may be squared or otherwise shaped for the reception of a key or manipulating crank so that the shaft 64 may be rotated by the operator when desiring to change the instrument from either a piano to a violin instrument or from a violin to a piano instrument. Because of the screw thread connection between the rod 63 and the arm 61 of the lever 51 the latter will be effectually locked in any desired adjusted position.

Each key 43 controls a damper 67 through a lever 68 pivoted upon a rail 69 extending back of the keys and in front of the strings and the lever 68 has one end in operative relation to the screw 46 on each key 43 so that whether the piano action or the violin action be the one in use, the damper 67 will be actuated each time the particular key controlling it is depressed.

In order to apply rosin to the bowing heads there is provided for each bowing

head a U-shaped carrier 70, between the free ends of the legs of which there is mounted a cylinder 71 of rosin so as to turn freely and the frame 70 is mounted in another frame 72 so as to move bodily therethrough, being mounted upon rollers 73 in order that the bodily movement of the frame 70 may be free.

The frame 70 is urged toward the bowing head by a spring 74 so as to maintain the rosin in engagement therewith and keep the bowing head well rosined. In order that the rosin of the cylinder 71 may wear uniformly, its axis of rotation is set at an angle to the axis of rotation of the bowing head as best indicated in Fig. 10.

It is desirable of course both for a manually operated instrument and especially for a mechanically operated instrument, such as the self-playing type of instrument to have means within the reach of the operator for modifying the tone-output of the instrument on the keys or by the speed of driving the impelling belt 2. For this reason there may be provided a harmonic damper 75 such as indicated in Fig. 5 and located between the strings 24 and the sounding board 23, this damper being mounted upon an appropriate lever 76 connected by a link 77 to a slide 78 having a handle 79 within easy reach of the operator. The damper 75 may be so constructed as to take in all or a part of the strings.

Instead of providing a damper such as shown in Fig. 5, the throw of the rod 47 may be controlled by a rock bar 80 extending along in front of the rods 47, so as to be moved into and out of the paths of pins 81 on the several rods 47. This may be accomplished by a sliding rod 82 having a handle 83 within reach of the operator. Or the throw of the keys 43 may be controlled by a rock bar 80' movable into and out of the path of the rear ends of the keys by means of a slide 82 provided with a handle 83 as in Fig. 6. The same effect may be brought about with the structure shown in Fig. 8 where the front ends of the keys are controlled as to the extent of depression by a bar 80'' under the control of the slide 82 as in Figs. 6 and 7.

The invention is not limited to any particular construction of bowing head but it has been found that excellent results are produced by constructing the bowing heads as follows: There is provided a tubular stem 84 having a head 85 fixed at one end and along one side having a rib or spline 86. A collar 87 is fixed to the shaft 30 and the end of the shaft beyond the collar is screw threaded to receive a nut 88. On the stem 84 are placed dished disks 89 preferably of hard or vulcanized rubber while between adjacent disks are placed plane

disks 90 of such diameter as to engage the dished portions of the disks 89, thus producing a certain resiliency or elasticity due to the fact that the disks 90 do not engage the disks 89 except by their edges while the head 85 and the collar 87 clamp the whole structure together when the nut 88 is screwed tight.

When the bowing heads are used in connection with wrapped strings, such as the lower register strings of the piano forte, the action of the spaced disks is interfered with by the uneven surface of the strings due to the presence of the wrapping. To avoid this trouble the wrapping wires may be turned down or otherwise made smooth where engaged by the bowing heads.

What is claimed is:—

1. A violin-piano having a bowing action, and a piano action operable from one set of keys, a single set of strings with each string in the path of a bowing head of the bowing action and a hammer of the piano action, and means for holding either action out of operative relation to the keys and strings at will.

2. A violin-piano having a bowing action and a piano action operable from one set of keys, a single set of strings with each string in the path of a bowing head of the bowing action and a hammer of the piano action, and means connected to both actions for moving one into operative relation with the strings as the other is moved out of operative relation to the strings.

3. A violin-piano having a bowing action movable as a whole into and out of operative relation to the strings, a piano action for the same strings movable into and out of operative relation thereto, and a common means for causing the movement of either of the two actions, comprising a rock lever connected at one end to the bowing action and at the other end to the piano action, and a screw actuating means for the lever for moving the latter in either direction and there holding it against accidental displacement.

4. A violin-piano provided with a set of strings, keys corresponding thereto, a pivoted frame having a bowing action sustained thereby, a pivoted frame carrying a piano action, and means connected to the two frames for moving them into and out of operative relation to the strings.

5. A violin piano comprising a set of strings, a set of keys for the strings, a pivoted frame carrying a bowing action and provided with a connection between the bowing action and the keys, a pivoted frame carrying a piano action and provided with connections between the piano action and the keys, and means for moving either action into and out of operative relation to the keys at will.

6. In a violin-piano, a bowing head, and means for applying rosin thereto comprising a block of rosin, a holder therefor in the form of a U-shaped frame with the block
5 of rosin between the free ends of the legs thereof, another frame carrying the U-shaped frame and provided with rollers supporting the U-shaped frame, and a spring between the two frames for maintaining
10 the rosin block in engagement with the bowing head.

7. In a violin piano, a bowing head and a holder for a block of rosin provided with means for holding the rosin to the bowing
15 head and having an axial support for the rosin at an angle to the axis of rotation of the bowing head.

8. A violin piano bowing head having a

suitable stem, dished bowing disks and plane separating disks in alternation on said stem; 20 the plane disks engaging the inner dished faces of the dished disks.

9. A violin piano bowing head having a suitable stem, dished bowing disks thereon, and plane separating disks intermediate of 25 and housed in the dished disks and of less diameter than and having their peripheries engaging the inner dished surfaces of the dished disks.

In testimony that I claim the foregoing 30 as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES LUCK WARNER.

Witnesses:

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J. O. DAILEY.