

(No Model.)

J. RUDOLF.
PIANO ACTION.

No. 308,201.

Patented Nov. 18, 1884.

Fig: 3.

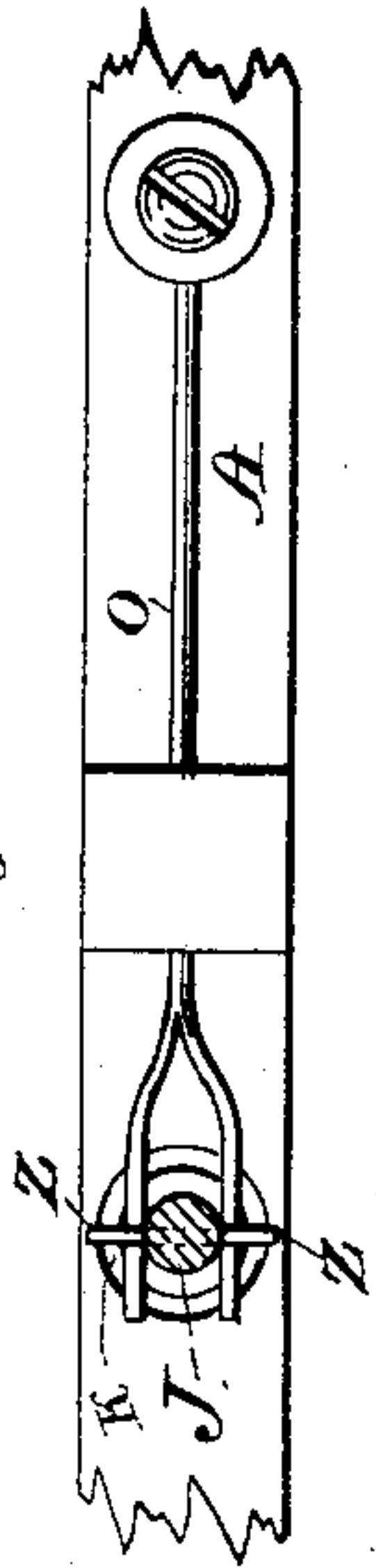


Fig: 2.

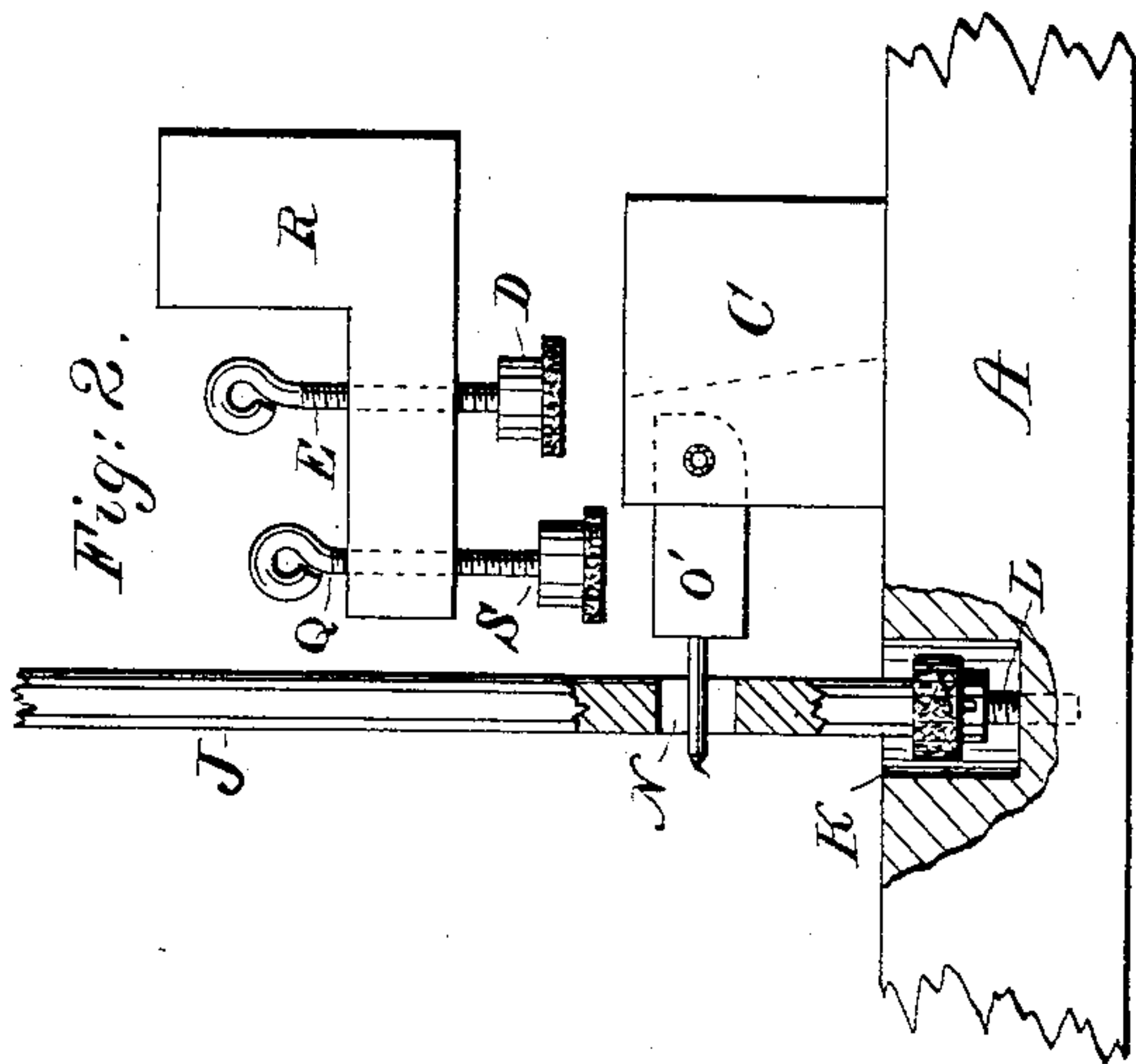
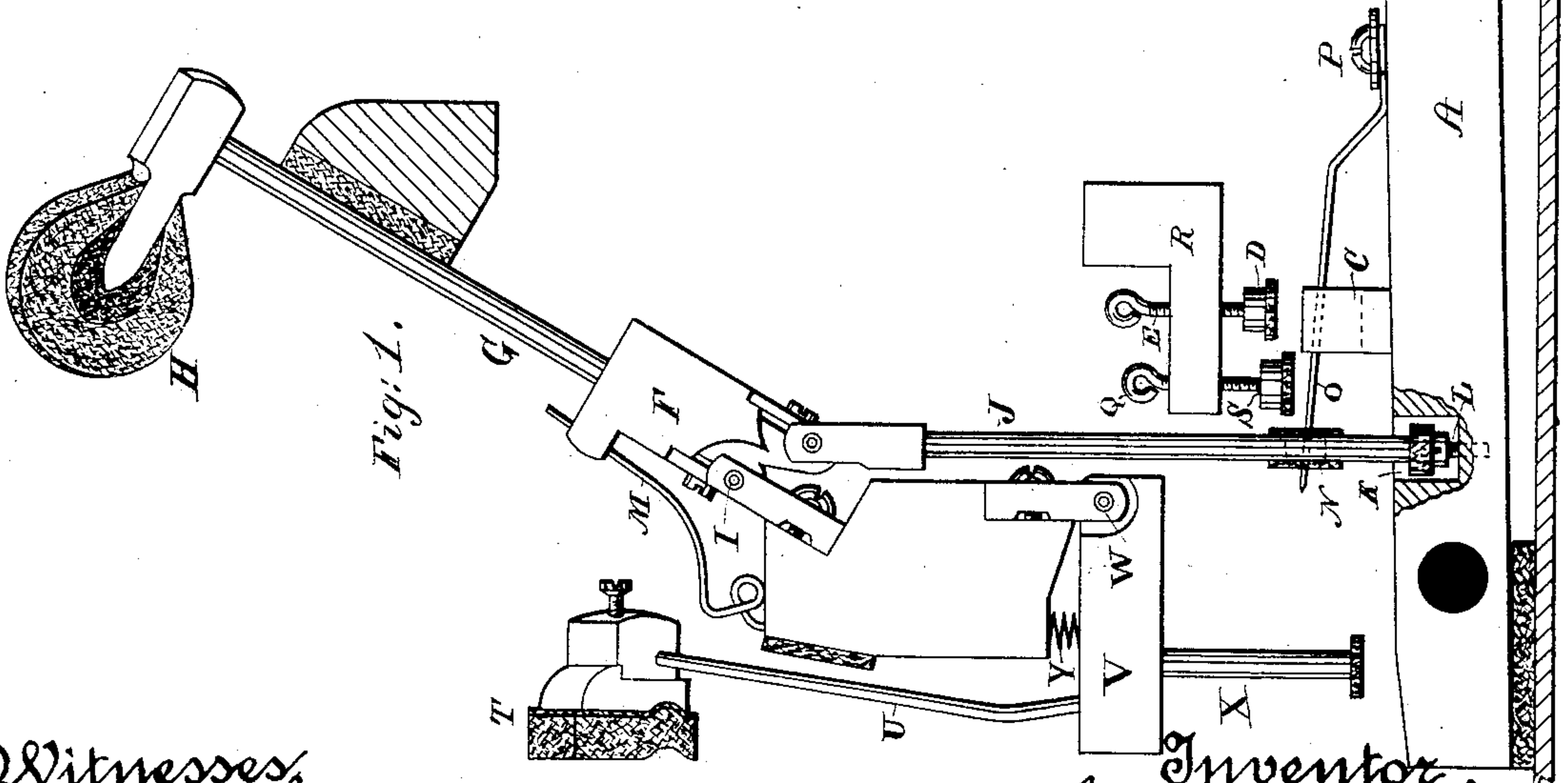


Fig: 1.



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UNITED STATES PATENT OFFICE.

JOHN RUDOLF, OF SAN FRANCISCO, CALIFORNIA.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 308,201, dated November 18, 1884.

Application filed November 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN RUDOLF, of the city and county of San Francisco, and State of California, have invented an Improvement in Piano-Actions; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improvement in what is known as "piano-actions;" and it consists in a combination of devices hereinafter explained and claimed.

Figure 1 is a side elevation of a single key or lever, with its hammer, damper, and the intermediate mechanism, as applied to an upright piano. Fig. 2 is a side elevation showing a modification of the mechanism. Fig. 3 is a plan view of a key or lever section of the hammer connecting-rod, and a means for connecting the two.

In the ordinary construction of piano-action the key-lever actuates a second shorter lever, which has a tripping-arm hinged to it, and this engages the block into which the arm or handle of the hammer is fixed, so as to throw the hammer forward against the string, from which it is retracted by a spring after being released from the tripping-lever, and a pad or buffer, supported by a second arm, which projects from the lever before mentioned, receives it as it falls back, and prevents vibration.

In my invention, A is the key-lever of a piano, moving on the balance-rod at B.

C is a block fixed to the rear portion of the lever, and D is a buffer fixed to a screw-stem, E, above the block, so that it may be adjusted up or down, and thus limit the motion of the lever.

F is a block into which the stem or handle G of the hammer H is fixed, and this block is hinged or pivoted at one of its lower angles, as shown at I.

J is a connecting-rod pivoted to the opposite lower corner of the block, and extending down into a cavity, K, formed in the top of the lever, and having a buffer upon its lower end. A screw, L, is fitted in the bottom of the hole, and may be adjusted up or down to compensate wear or variations in the other parts. When the key is struck, the opposite end of the lever is thrown up, and, acting upon the rod J, throws the hammer H forward to

strike the string. A light curved spring, M, acts to withdraw the hammer from the string after the stroke, so as not to interfere with its vibration.

In order to steady the hammer and connecting-rod after a stroke, a slot, N, is made through the lower part of the rod J, and a light wire spring, O, passes through the slot and through a slot in the block C, which is fixed to the key-lever. In front of this block it is bent downward, so as to be secured to the top of the lever at P. A screw-stem, Q, passes through a block, R, above the spring O, and just in front of the screw E, which passes through the same block. The screw Q has a buffer, S, upon its lower end, and when the key is struck the block C, the rod J, and the spring O are moved up simultaneously. The top of the spring first comes in contact with the buffer S, and the block C next strikes the buffer D, thus limiting the upward motion of the key-lever. The impetus of the hammer carries it forward until it strikes the string, the slot in the rod J being long enough below the spring O to allow the rod to continue its upward movement far enough to allow the hammer to strike. When the hammer rebounds from the string, the lower end of the rod J, resting upon the adjusting-screw L in the key-lever, prevents any further backward movement when the key is held down, while the spring O, resting its upper side against the buffer S and the lower side at the front end in the slot in the stem or rod J, acts to steady the latter and prevent all vibrations.

It will be seen that by means of the screws E and Q the buffers D and S may be adjusted to any desired degree of nicety. The damper T has a handle or stem, U, fixed in the short lever or block V, the front end of which is pivoted at W. A stem, X, extends downward from its rear end, and has a buffer on its lower end, which is struck by the rear end of the key-lever, so as to raise the damper from the string before the hammer strikes it. A spring, Y, returns the damper to its normal position as soon as released by the key-lever.

In Fig. 2 I have shown in place of the spring O a short arm, which is hinged or pivoted to the block C upon the key-lever, and has a wire projecting from its front end to enter the slot

in the stem J in the same manner as shown with the spring O. The top of the arm strikes the buffer S when the key is struck, and its upward motion is limited, as before described.

5 Instead of passing through the stem J, the spring O may be forked, so that one branch passes on each side of the stem, and they engage a pin, Z, which passes transversely through the stem. It will be manifest that
10 other equivalents for these devices may be substituted for them without altering the essential features of my invention. This construction greatly simplifies the action, makes it strong and durable, easily adjustable, and
15 not liable to get out of repair.

In order to keep the fronts of the keys level, it is customary to place layers of cloth or paper beneath the key-lever around the balance-rail pin.

20 In my device the balance-rail pin has a screw cut upon its lower end to screw into the balance-rail. A collar, a, is fixed to the pin b, and a chamber is formed in the rail below it to allow it to be depressed into the chamber
25 by turning the screw in, and it is raised to any desired extent by turning the screw out. Upon this collar the cloth pads or buffers are placed, upon which the key-lever rests. The

upper end of the pin is made square, or otherwise fitted to receive a key or wrench, by which to turn it, and the adjustment is thus easily made.

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

1. In a piano-action, the key-lever, the hinged swinging hammer, and the rod or stem J, connecting the butt of the hammer-shank directly with the key-lever without the intervention of a jack or fly-lever and fly, and the adjustable key-stop D, in combination with the arm O, arranged with relation to the stem, as shown, and the adjustable stop S, substantially as herein described.

2. In a piano-action, the key-lever, hammer connecting-rod, and adjusting-screw, the buffers D and S, and the stop O, in combination with the damper T, with its arm, hinged block, and the stem X, substantially as herein described.

In witness whereof I hereunto set my hand.

JOHN RUDOLF.

Witnesses:

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GEO. H. STRONG.