

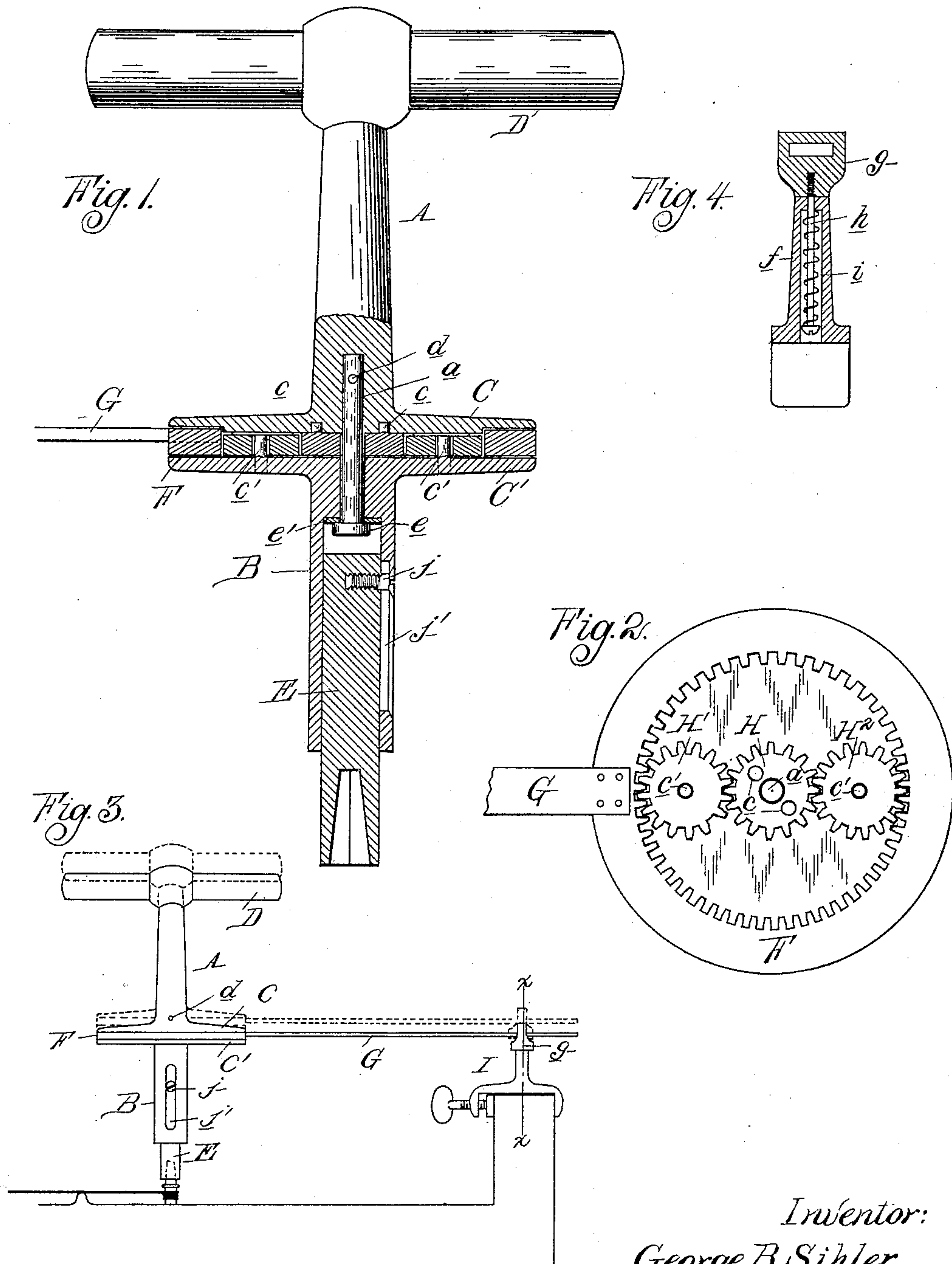
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Patented Jan. 16, 1900.

G. B. SIHLER.  
TUNING KEY FOR PIANOS.

(Application filed Feb. 27, 1899.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

GEORGE B. SIHLER, OF DETROIT, MICHIGAN.

## TUNING-KEY FOR PIANOS.

SPECIFICATION forming part of Letters Patent No. 641,473, dated January 16, 1900.

Application filed February 27, 1899. Serial No. 706,913. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. SIHLER, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Tuning-Keys for Pianos, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

The invention is especially designed to give the operator an advantage in power, while the handle is the same as that of the ordinary key; and to this end my invention consists in the peculiar application of reducing-gear, all as more fully hereinafter set forth, and shown in the accompanying drawings, in which—

Figure 1 is an elevation of my improved key, with the lower portion thereof shown in vertical central section. Fig. 2 is a top plan of the lower part of the key. Fig. 3 is a diagrammatic elevation showing the key as in operation. Fig. 4 is an enlarged vertical section through the clamp on line  $x x$ , Fig. 3.

My improved key has a shank composed of two independent parts A B, formed at their adjacent ends with corresponding enlarged heads C C'. The part A is formed or provided with the usual hand-grip D, and the part B carries at its lower end, detachably secured thereto, the usual socket-piece E, which has formed in its lower end the socket for engaging the tuning-pin.

F is a ring loosely interposed between the heads C C'. It is internally geared and an arm G is rigidly secured to it and extends laterally in a plane at right angles to the axis of the key. This ring, together with the heads C C', forms a housing, in which are inclosed the gear-pinions H H' H<sup>2</sup>. The gear-pinion H turns loosely upon a pin  $a$  in the axis of the key, and it has two studs  $c c$ , engaging into corresponding recesses in the under side of the head C.

The gear-pinions H' H<sup>2</sup> turn loosely upon pins  $c'$ , fast in the head C', and intermesh with the pinion H and the internal gear of the ring F.

The pin  $a$  holds the two parts A B detachably together and allows each to turn independently of the other. To this end it extends into the parts A and B, being held fast in the

part A by a pin  $d$  and in the part B by a head  $e$  and washer  $e'$ , which permit it to turn loosely therein. Any other means for accomplishing this object, however, may be used.

In connection with this key a clamp I is used, which has a hollow post  $f$ , supporting a guide-bearing  $g$ , through which the arm G is adapted to slide loosely. The guide-bearing is secured to a tension-rod  $h$ , upon which is sleeved the coil-spring  $i$ , all so arranged that the guide-bearing is free to turn upon its axis and at the same time can be withdrawn some distance above the post.

In practice the parts being arranged as shown and described they are intended to operate as follows: The key being engaged with the tuning-pin in the proper manner, the clamp I is first secured to any convenient part of the frame or casing of the instrument in such position that if the arm G is engaged in the bearing  $g$  thereof it will be in a plane at right angles to the axis of the tuning-pin. The operator by means of the grip-handle then turns his key to tighten the pin, and in so doing it will be seen that the part A turns the gear-pinion H with it and revolves it around the center pin  $a$ , while the pinions H' H<sup>2</sup>, being prevented from turning the ring F by reason of its being held fast by the arm G, are compelled to revolve around the pinion H, and thereby impart a relatively slower movement to the part B, the relative proportion between the speed of the parts A and B being the same as between the number of teeth on the ring and the number of teeth on the pinion H. The power exerted by the operator upon the part B is thus increased at the inverse ratio, and consequently it takes less power with my key to strain the wires than it does with the ordinary key, and the tuning is accomplished more readily by reason of this slower movement with which the pin is turned. At the same time the power of the operator is exerted in the axis of the key the same as with the ordinary key, and thus the liability of bending and thereby injuring the tuning-pins, which is so frequently done by using tuning-keys provided with lever-handles, is done away with.

The arm G is made long enough to give a suitable range to the key without changing



the position of the clamp. As shown in the drawings, it will have a range of about three octaves.

The object of the construction shown in Fig. 4 is to allow the bearing *g* to turn freely on its axis and also to permit the withdrawal of the key from the tuning-pin by a movement in the direct line of the axis of the pin, as shown in dotted lines in Fig. 3, so as to avoid all possibility of bending the tuning-pin.

I preferably construct the key with a vertically-adjustable socket-piece *E*, so as to make it shorter or longer, as may be necessary or desirable with instruments of different make. This adjustability may be obtained in any known manner. In the drawings the socket-piece is vertically adjustable in the part *B* by means of the small set-screw *j* engaging in the vertical slot *j'*. This adjustability also permits of adjusting the arm *G* in proper relative position to the clamp if the clamp cannot be adjusted to the arm. To prevent the clamp from marring any of the woodwork, the jaws should be covered with some soft material.

What I claim as my invention is—

1. The combination in a tuning-key, of an arm turning loosely upon said key in a plane at right angles thereto, an extensible socket-piece carried by the key and a clamp having a swiveled guide-bearing for the arm vertically extensibly connected with the clamp.

2. The combination in a tuning-key, of a shank composed of separate grip and socket portions having corresponding circular enlargements, at their inner ends an internally-gear ring interposed between and against which said enlargements are seated means for holding the ring stationary, a pin axially connecting the grip and socket portions of the shank which are free to rotate upon their axes independently of each other and of the ring, said ring forming the stationary part of a reducing-gear inclosed within the ring and adapted to transmit motion from the grip to the socket portion of the shank, and a vertically-adjustable socket-piece carried by said socket portion.

3. The combination in a tuning-key, of a shank composed of separate grip and socket

portions, an internally-gear ring against which the inner ends of said shank portions are seated on opposite sides by means of corresponding enlargements on the inner ends of said shank portions, a center pin axially connecting the shank portions which are free to revolve on the ring independently of each other, means for holding the ring stationary, a gear-pinion concentric with the ring and connected to the grip portion of the shank, and one or more intermediate pinions carried by the socket portion of the shank and intermeshing with the aforesaid geared ring and pinion, and the adjustable pocket-piece *E* detachably secured to said socket portion.

4. The combination in a tuning-key, of a shank composed of separate grip and socket portions formed with circular enlargements at their inner ends, an internally-gear ring interposed between said enlargements and forming in connection therewith a housing, means for holding the shank portions in axial line with each other and with the ring free to turn independently of each other, a center pin inclosed within the housing and carried by the grip portion of the shank, one or more intermediate pinions between the ring and center pinion and carried by the socket portion of the shank, an arm on the ring and a clamp having a swivel guide-bearing for the arm.

5. The combination in a tuning-key, of a shank composed of separate grip and socket portions, a ring interposed between and against which said shank portions are seated axially with each other and with the ring and adapted to rotate independently of each other, an internal gear on the ring, a center pinion carried by the grip portion of the shank, one or more intermediate pinions carried by the socket portion of the shank, an arm on the ring and a clamp having a swiveled guide-bearing for the arm extensibly connected to the clamp.

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

GEORGE B. SIHLER.

Witnesses:

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V. D. KINNER.