

F. MENZENHAUER.
ZITHER KEYBOARD.
APPLICATION FILED JUNE 7, 1910.

989,275.

Patented Apr. 11, 1911.

Fig. 1.

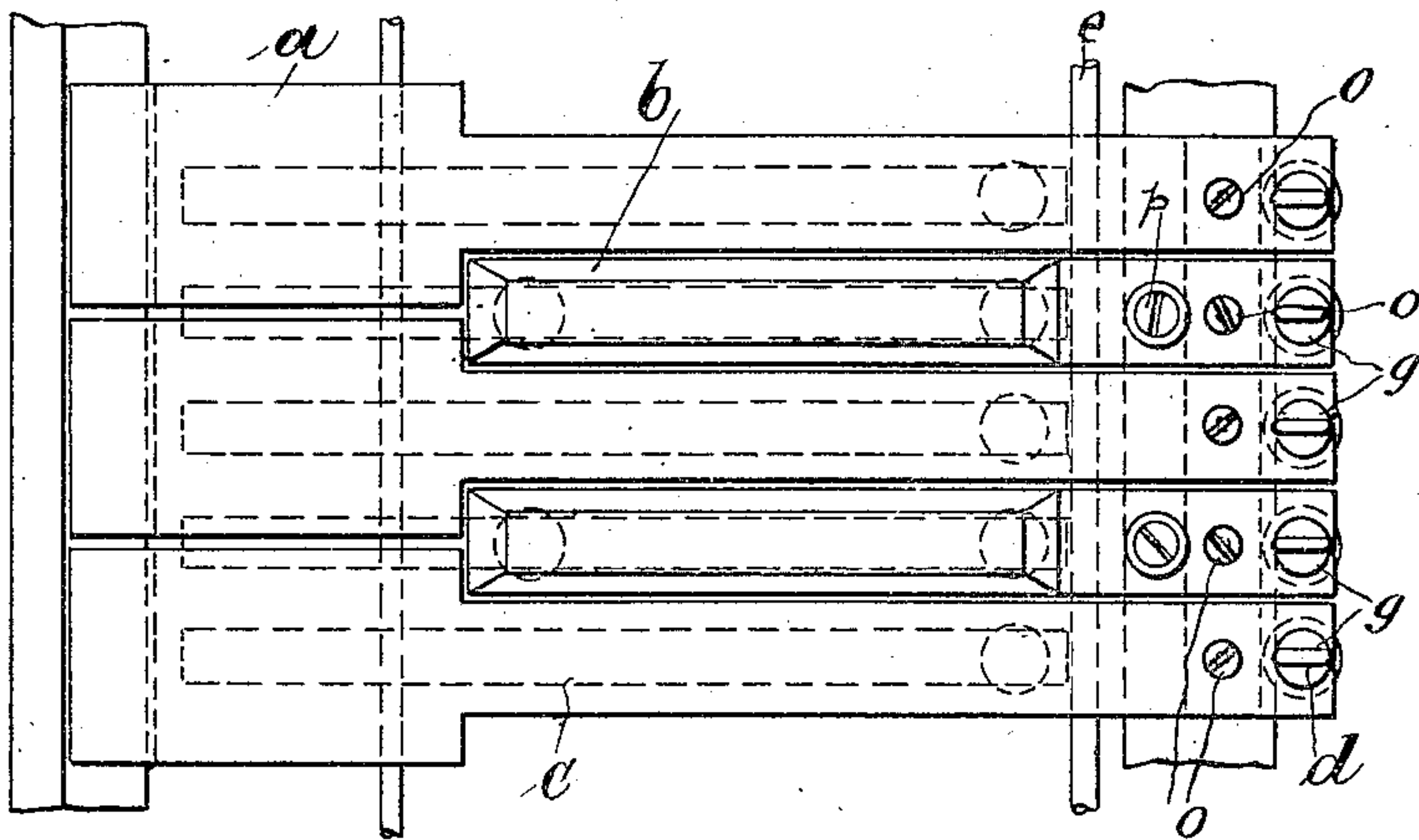


Fig. 2.

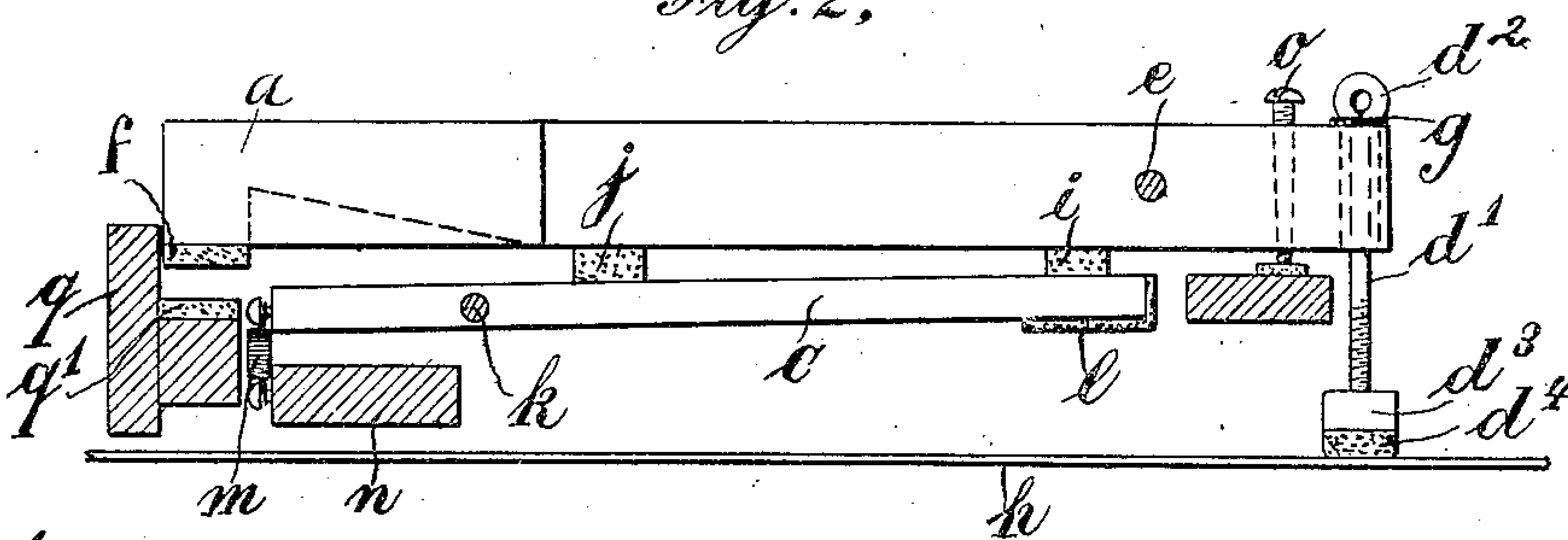


Fig. 4.

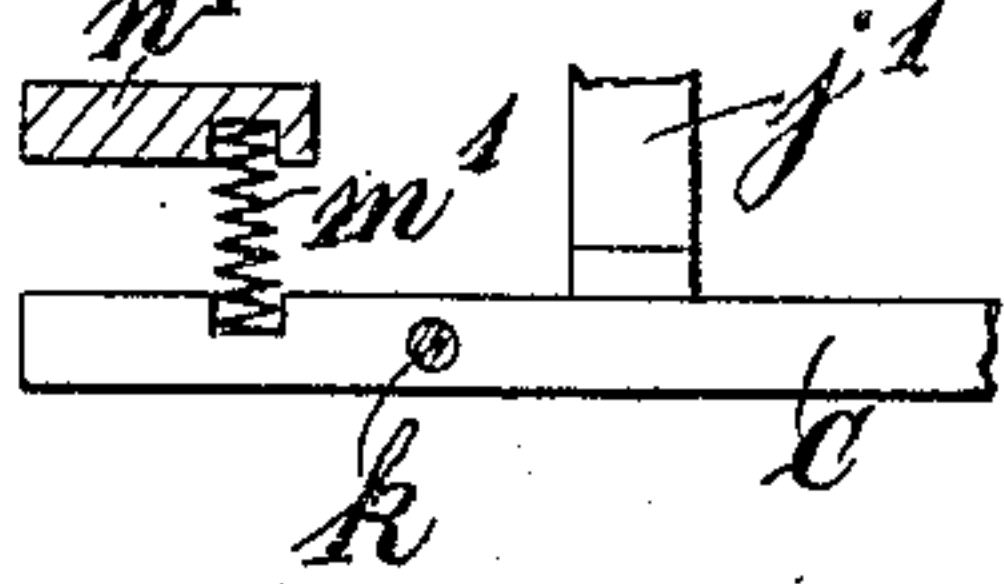
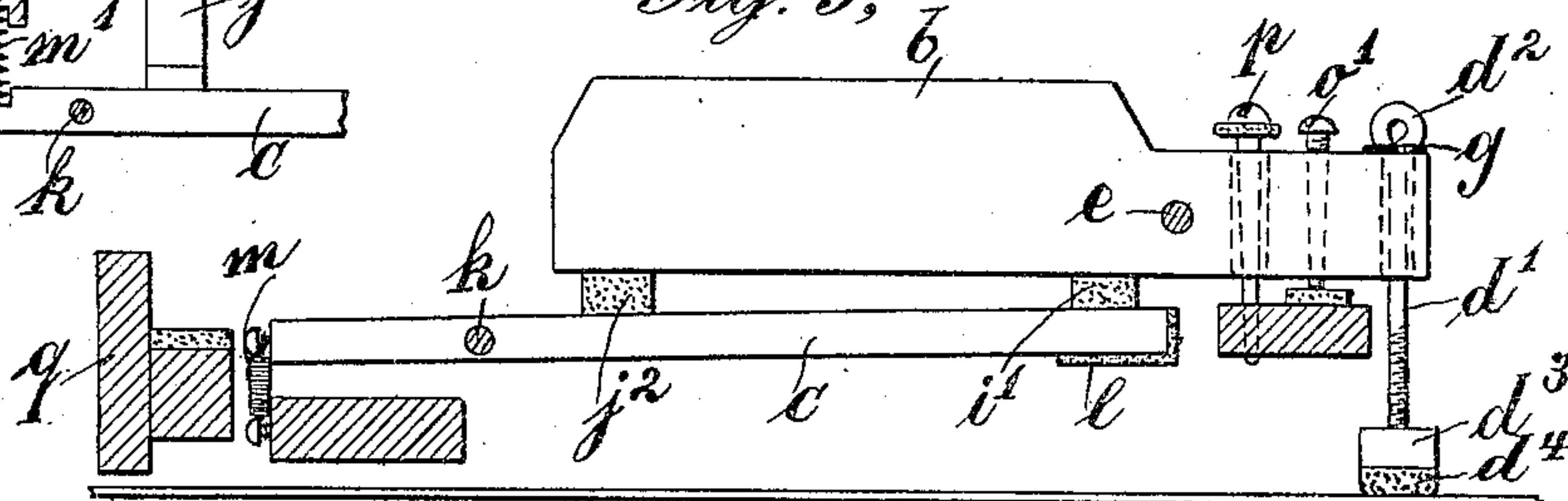


Fig. 3.



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UNITED STATES PATENT OFFICE.

FREDERICK MENZENHAUER, OF JERSEY CITY, NEW JERSEY.

ZITHER-KEYBOARD.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK MENZENHAUER, a citizen of the United States of America, and a resident of Jersey City, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Zither-Keyboards, of which the following is a specification.

This invention has reference to improvements in key-boards for stringed musical instruments.

It is the purpose of the present invention to produce an improved key-board for mandolin harps, guitar zithers and like instruments which comprises keys, rigid hammers with springs, and a separate damper for each key. The dampers are adjustable and located one in the rear portion of each key wherein it is movable. Accordingly an independent damper is above every string and normally in contact with same while the adjustment is effected in the top portion of the damper proper. The hammers below the keys are rigid but each hammer is provided with a small coil spring secured to the front portion of same. The described parts are so arranged that by a touch upon the key the spring hammer below same strikes the string and releases the normally active damper from the latter so that a sound is produced. Upon releasing the touch from the key the hammer returns to its normal position and the damper descends again onto the string. Now the key is ready for a new touch.

The invention is illustrated in the accompanying drawing in which:

Figure 1 represents in top plan view part of a key-board embodying in desirable form the present improvements. Fig. 2 is a side elevation, partly in section, of a white key with damper and hammer below. Fig. 3 is a side elevation, partly in section, of a black key with damper and spring hammer below, and Fig. 4 shows a modified spring arrangement.

Similar characters of reference denote like parts in all the figures.

In the drawing *a* represents the white keys, *b* the black keys, *c* the rigid hammers with coiled springs and *d* the dampers. The white keys are movably mounted on a metal rod *e* which is preferably made of steel and passes through the rear portion of same. The rod *e* is suitably supported in the usual manner. The lower front portion of each key car-

ries a narrow strip of felt *f* and may be preferably hollowed out as shown. In the rear of each key the damper *d* passes through same. Each damper consists of a metal rod *d*¹ which passes through an opening in the rear portion of the key and moves loosely therein. At the top the rod *d*¹ forms a small loop *d*² which rests on a small washer of felt *g* that rests on the key. The lower portion of the rod *d*¹ is threaded and extends into a small wooden block *d*³ to the bottom surface of which a circular piece of felt *d*⁴ is secured which normally rests on the string *h* below same. By turning the loop *d*² of the damper in one or the other direction while holding the bottom part of same the threaded portion of the rod *d*¹ goes farther into or out of the small wooden block *d*³ whereby an adjustment of the damper relative to the string *h* and the key *a* may be effected. The key *a* further is provided with a small felt block *i* on its lower rear surface and a somewhat larger felt block *j* on its lower front surface.

The hammers *c* below the keys consist of thin wooden bars movably mounted on a metal rod *k* which passes through their front portions. The rear bottom and end surface of each hammer is covered with a layer of felt *l*. To the front surface of each hammer a coiled spring *m* is secured which extends vertically down and is secured with its lower end to a wooden block *n* suitably supported in the frame of the key-board. When at rest the spring *m* keeps the hammer *c* in touch with the felt blocks *i* and *j* of the key *a* by virtue of the relative location of the metal rods *e* and *k*. Upon touching the key *a* the rear portion of same ascends carrying the damper along and raising it from the string while the rear portion of the hammer descends and strikes the string thus producing the sound. When the touch is released the key returns into its normal position and the spring *m* forces the rear portion of the hammer *c* up until it rests again against the felt blocks *i* and *j* of the key while the damper descends onto the string into its normal position. Each key is provided with an adjusting set screw *o*.

When touching the key the spring *m* opens in the above described arrangement. In Fig. 4 a spring *m*¹ is secured in the top portion of the hammer *c* in front of the metal rod *k*. The spring *m*¹ is secured with its top end in a bar *n*¹. When the key is

touched the block j^1 forces the hammer down whereby the spring m^1 is depressed. This arrangement may be applied in instruments when space need not be economized. As shown the block j^1 has to be considerably longer than in the previous arrangement.

The black keys b are substantially mounted the same way as the white keys on a metal rod e . Each key carries a damper d in the rear of a like construction as the dampers described in connection with the white keys. Adjusting set screws o^1 , p are located in the rear portion of each key and felt blocks i^1 , j^2 are secured to its bottom surface. The hammer c below the black keys is of like construction as above described and the spring m operates in like manner. The adjusting set screw or stop p above mentioned is placed into the short black key to limit its upward movement while the white key has a stop to limit the downward movement. In front of the white keys an attachment q is secured to limit the downward movement of these keys and having on its inner top surface a layer of felt q^1 to ease the impact of the keys when descending onto same.

The described arrangement of the damper in the rear portion of the key which is movable therein and adjustable in the top portion of the damper proper greatly improves the tone. When the key is touched the damper is thrown upward away from the string and when the finger is released from the key the damper returns onto same by gravity whereby the tone is allowed to die gradually away before the damper reaches the string again. In the described manner a full, melodious and agreeable tone is produced by the coöperation of the various parts above mentioned.

I claim as my invention:

1. In a key-board for a stringed musical instrument, a key, a metal rod passing horizontally through the rear portion of the key so that it is movable thereon, a hammer below said key, a second metal rod passing horizontally through the front portion of the hammer so that same is movably mounted thereon, means whereby the key operates the hammer, and a damper resting on a string passing loosely through the rear portion of the key and forming a loop above

same, said damper being raised from the string by a touch upon the key and descending onto same by gravity when the finger is released from the key.

2. In a key-board for a stringed musical instrument, a key, a metal rod passing horizontally through its rear portion so that the key is movably mounted thereon and a hammer below, a second metal rod passing horizontally through the front portion of the hammer so that same is movably mounted thereon, means whereby the key operates the hammer, a spiral spring having one end secured to the front portion of the hammer, a support near by to which the second end of the spring is attached, and a damper normally resting on a string passing loosely through the rear portion of the key and forming a loop with its top end, said hammer being raised from the string by a touch upon the key and descending onto same by gravity when the finger is released from the key.

3. In a key-board for a stringed musical instrument, a key movably mounted, and an adjustable damper passing loosely through its rear portion and normally resting on a string, said damper consisting of a metal rod with threaded lower portion, a small wooden block in which the rod is adjustable, a felt layer on the bottom surface of the wooden block, a loop formed at the top end of the rod, and a felt washer on the rod resting with the loop on the top of the key.

4. In a key-board for a stringed musical instrument, movable keys, a metal rod passing horizontally through their rear portions, spring-operated hammers below the keys, a second metal rod passing horizontally through the front portions of said movable hammers, and two felt blocks on the bottom surface of each key one in its front and one in its rear portion between the two metal rods the spring operated hammers being normally in contact with the felt blocks of the keys.

Signed at New York, N. Y., this 6th day of June, 1910.

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Witnesses:

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