

F. MENZENHAUER.
STRINGED MUSICAL INSTRUMENT.
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970,845.

Patented Sept. 20, 1910.

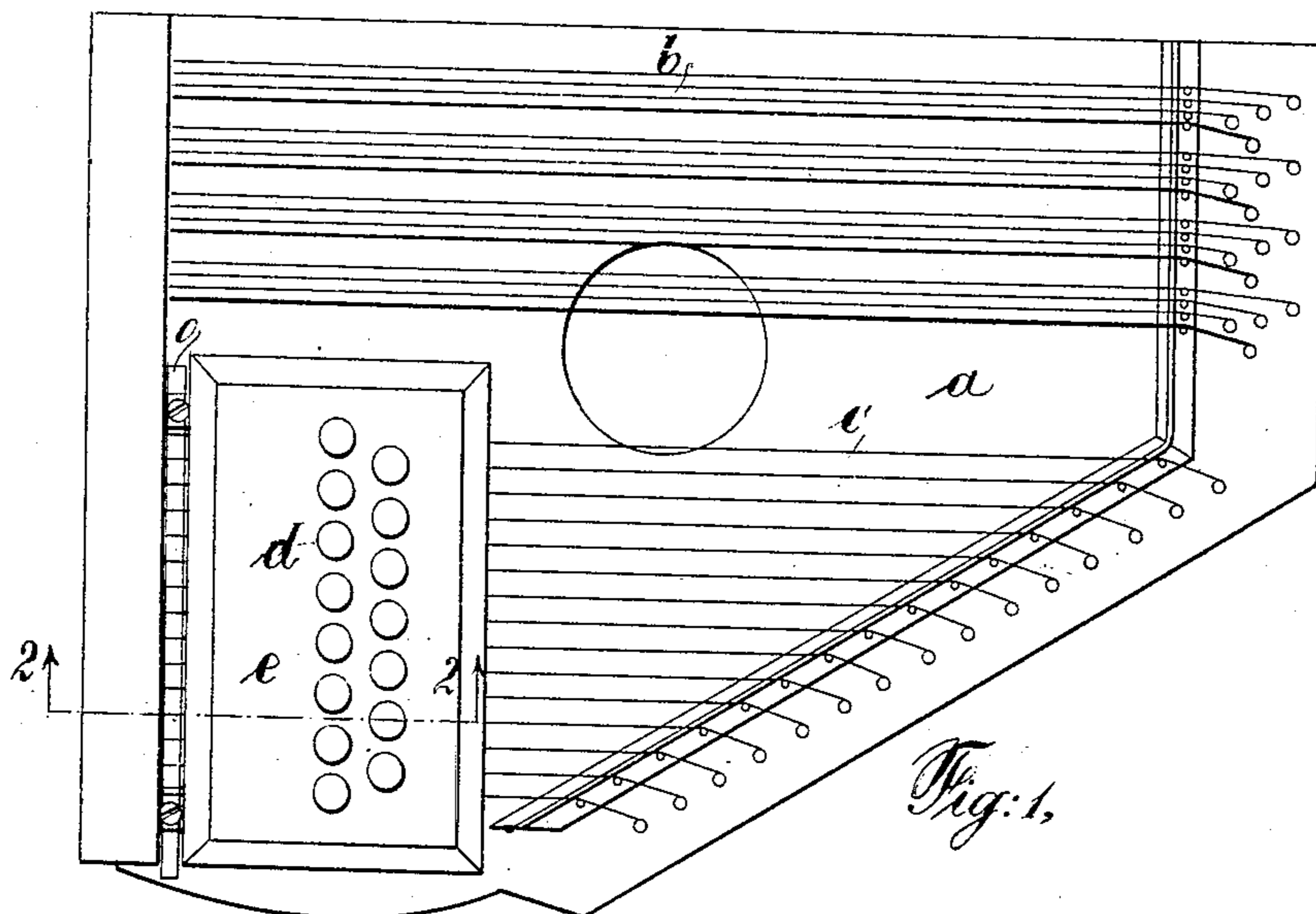


Fig. 1.

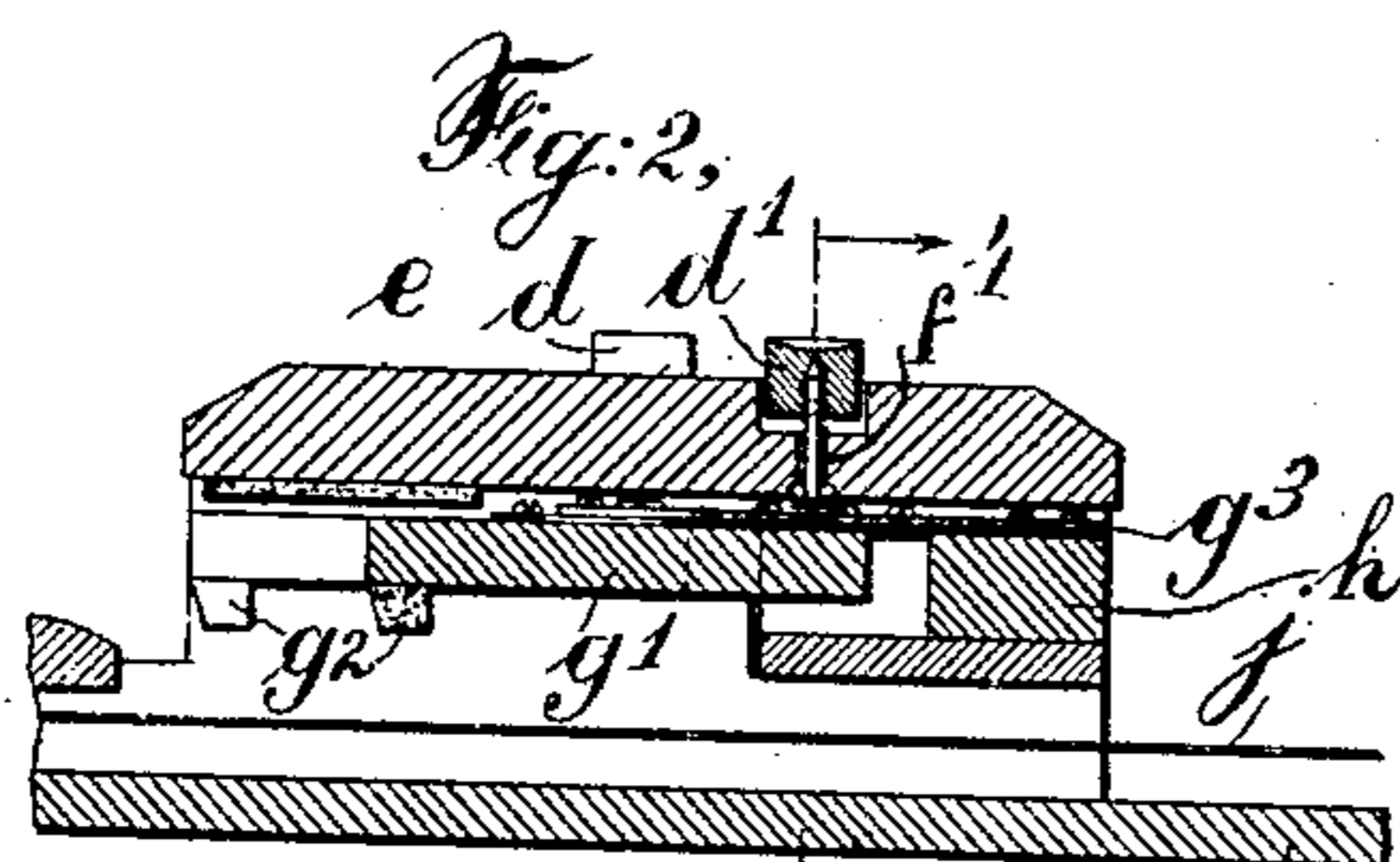


Fig. 3.

→ 4

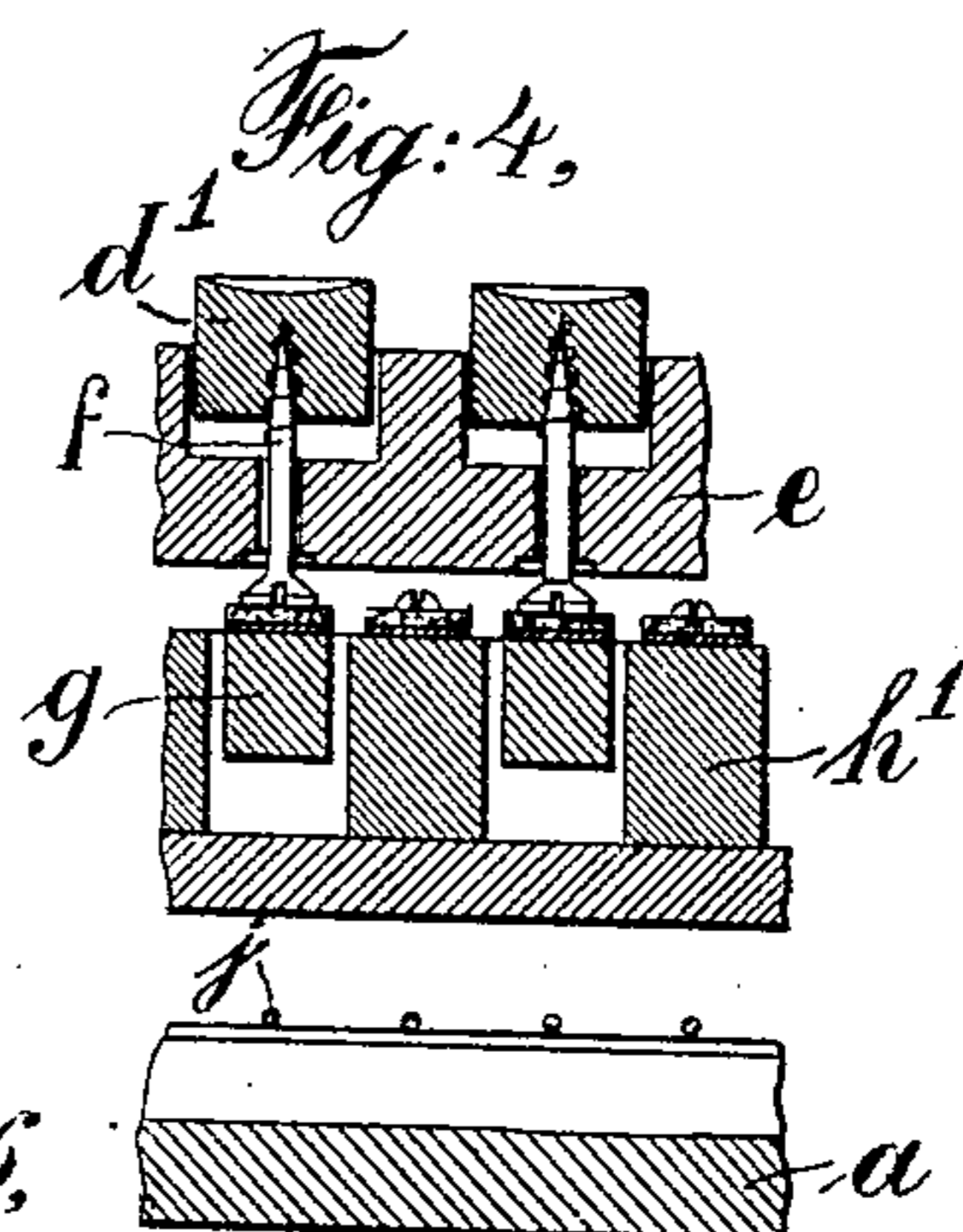


Fig. 4.

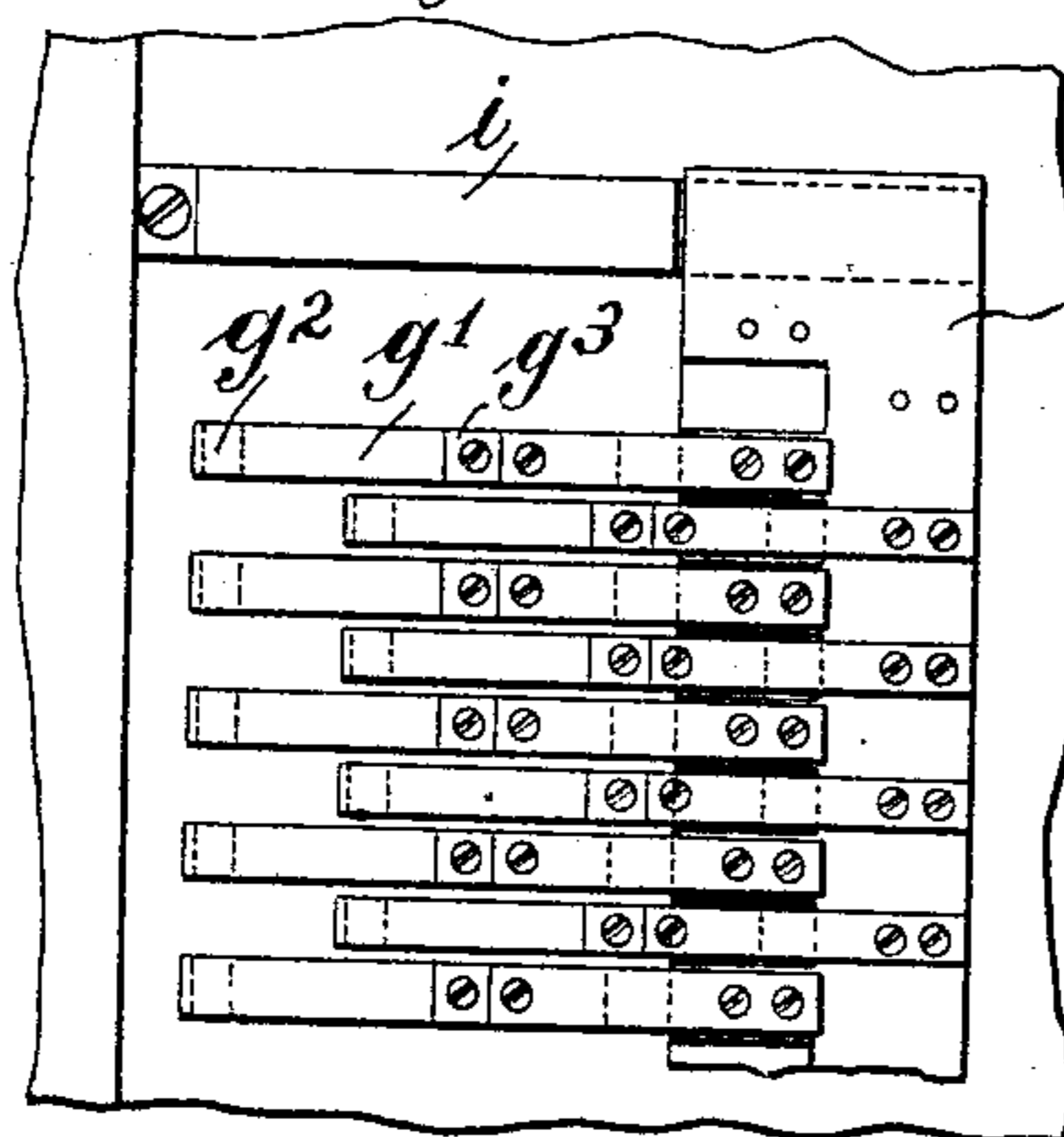


Fig. 6.

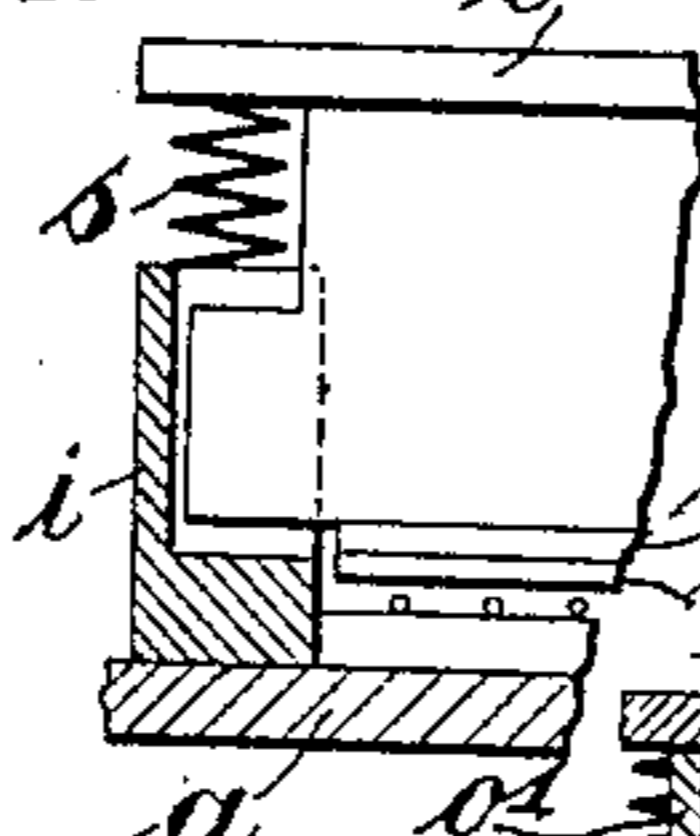
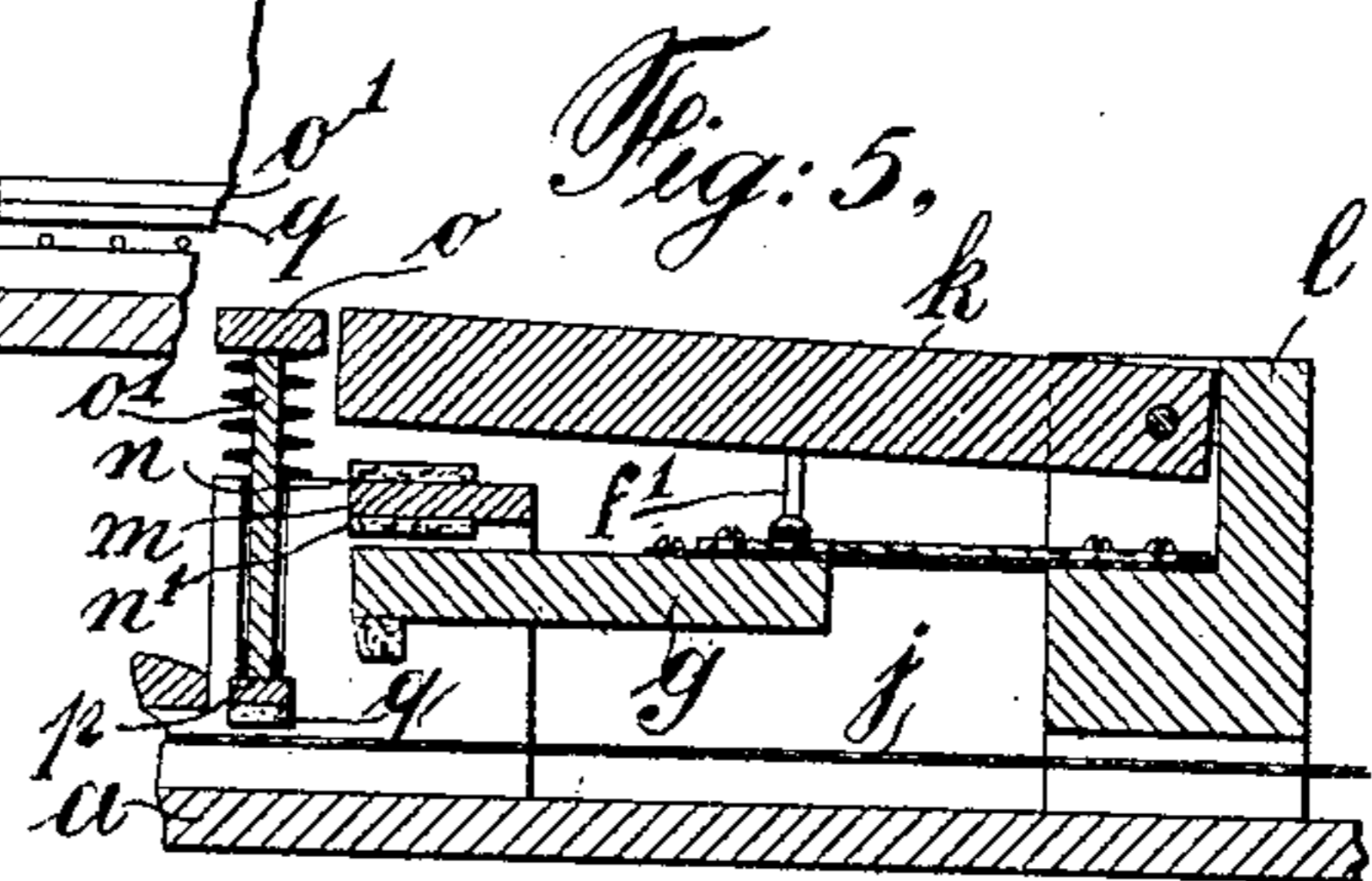


Fig. 5.



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UNITED STATES PATENT OFFICE.

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STRINGED MUSICAL INSTRUMENT.

970,845.

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To all whom it may concern:

Be it known that I, FREDERICK MENZENHAUER, and a resident of Jersey City, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Stringed Musical Instruments, of which the following is a specification.

This invention has reference to improvements in stringed musical instruments. It pertains particularly to mandolin-harps, guitar-zithers and the like instruments in which the accompaniment is played on strings conveniently grouped to form chords while the melody is played on an open scale of strings. Such instruments are so constructed that any one may easily learn to play them in a short time without acquiring a thorough knowledge of music.

Heretofore instruments of the type described were played by means of picks or plectrums to pick the strings for producing a tune. This required the instrument to be placed in a certain position for playing and in some instruments the entire key-board had to be pushed sidewise to pick the strings.

It is the purpose of the present invention to produce a stringed musical instrument which may be played in any conceivable position found to be convenient by the player for instance on a table like the old zither or it may be held horizontally, inclined or even nearly vertically and the key-board need not be shifted. These main objects have been primarily attained by the use of a key-board and action secured to the sounding board above the melody strings and provided with adjustable keys and flexible hammers below which return automatically into their normal position after having struck the strings. The improved instrument occupies but little space and a chromatic scale if provided thereon does not require any more room than a common scale. By simplicity in construction liability to derangement has been greatly reduced and care has been taken to produce a neat and desirable article, all as will be fully described hereinafter with reference to the accompanying drawings in which:

Figure 1 represents in top plan view a mandolin harp embodying in desirable form the present improvements. Fig. 2 is a transverse vertical section on an enlarged scale on line 2—2 of Fig. 1. Fig. 3 illustrates in top plan view on an enlarged scale part of the

flexible hammer arrangement. Fig. 4 is a partial vertical section on an enlarged scale on line 4—4 of Fig. 2. Fig. 5 is a sectional view of a modified form of adjustable key with flexible hammer and Fig. 6 is a partial elevation of a detail.

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

The novel key-board and action are attached to the sounding board above the melody strings. The action can not be operated directly without a key-board whose keys are essential for producing pure and melodious tones.

In the drawing *a* represents the sounding board of the mandolin harp or zither illustrated. The strings *b* are conveniently grouped into chords for manipulation with the left hand and the open scale of melody strings *c* is arranged at the other side on the sounding board. The attachment is secured to the sounding board above the melody strings as shown in Fig. 1. The attachment consists of a set of keys and a set of hammers below the keys as shown in detail in Figs. 2, 3 and 4. The keys *d* are mounted in the top boards *e* of the attachment and arranged in the order shown in Fig. 1. Each key consists of a circular body portion *d*¹ whose top is slightly hollowed out forming thus a finger tip. The body portion *d*¹ of each key is in a vertical circular incision of the board *e* which extends down beyond the middle of the board. A screw *f* is provided in the lower central portion of each key which forms the adjustable part of same. This screw passes through a vertical narrow channel in the board *e* which communicates with the incision above referred to. The screw having its head at the bottom may easily be adjusted in relation to the flexible hammer below which is operated thereby.

The flexible hammers *g* are arranged on a narrow strip of wood *h* which is secured on two supports *i* that are permanently attached to the sounding board *a*. Each flexible hammer consists of a small oblong bar *g*¹ preferably made of wood. On the bottom end surface of each bar *g*¹ there is a downwardly extending projection *g*² which forms the hammer proper adapted to strike the string when the key is pressed down. Opposite the part *g*² and screwed with one end to the top surface of the oblong bar *g*¹

there is a narrow strip g^3 of metal preferably of steel sheeting, the top surface of which is covered with felt. These flexible hammers are arranged in two rows on the narrow board h to correspond with the two sets of keys above mentioned. The hammers form an outer and an inner set or row by arranging them successively and alternately in the order shown in Fig. 3. To render this possible the narrow board h is cut out on the inner side like a comb and each tooth like projection h^1 formed thereby has secured to its top surface the second end of the elastic metal strip g^3 of a hammer of the outer set. The second end of the elastic steel strip g^3 of each hammer forming part of the inner set is secured farther in on the body portion of the narrow board h . It is self-evident that the middle portion of the metal strip g^3 is free whereby the hammer becomes elastic or flexible.

Each flexible hammer is located above one melody string and above each hammer there is an adjustable key. When a key is touched the flexible hammer descends and strikes the melody string j below whereby a pure and melodious tone is produced without difficulty, more agreeable and clearer than can be produced by the picks heretofore employed. When releasing the key the flexible hammer is automatically returned to its normal position by means of the elastic metal strip forming part thereof.

In Fig. 5 of the drawing a modified form of adjustable key is illustrated with a flexible hammer below. The flexible hammer g is constructed as above described but the key consists of a small elongated block k made preferably of wood and hinged to the board l . The adjustable screw f^1 is located right above the inner end of the flexible hammer g and rests normally on the felt of its elastic metal strip or spring. Above the outer end of each hammer there is a thin wooden strip m covered with felt n , n^1 at the top and bottom. When the block or key k is pressed down the hammer descends and strikes the string j . When the touch is released the hammer returns into its normal position and forces the key also upward by means of its adjustable screw f^1 .

The attachment above described is applied to instruments of the usual size. For larger stringed instruments of this type it is advisable to insert a damper to stop the vibration and prevent resounding. Such damper may be applied on all instruments having long strings. It is illustrated by way of example in Figs. 5 and 6. The damper consists of a wooden bar o which is about even with the keys. Supports o^1 connect with a small bar p parallel to the bar o and covered on its bottom surface with a layer of felt q . Springs s are provided to retain the damper in its normal position

above the strings. The damper is conveniently mounted near the end of the strings and the attachment.

I claim as my invention:

1. In a stringed musical instrument comprising a sounding board with strings thereon, an attachment on the sounding board above the strings comprising adjustable keys, and flexible hammers below said keys and above the strings.

2. In a stringed musical instrument comprising a sounding board with an open scale of strings thereon, a key-board above said strings with adjustable keys, and flexible hammers below said keys and above the strings, each flexible hammer being provided with an elastic metal strip whereby same is returned into the normal position after striking a string.

3. In a stringed musical instrument, melody strings, a key-board above said melody strings attached to the sounding board having adjustable keys, and flexible hammers below said keys and above the melody strings, each flexible hammer being provided with an elastic metal strip, and a layer of soft material on said strip against which the key strikes.

4. In a stringed musical instrument of the type described, melody strings, a key-board on the sounding board above the melody strings having keys consisting each of a body with an adjustable screw in its lower portion, and flexible hammers below said keys and above the melody strings provided each with an elastic strip of sheet steel, and a layer of felt on the top surface, so arranged that the head of the adjustable screw of the key rests on the felt of the flexible hammer.

5. In a stringed musical instrument of the type described, melody strings, a set of flexible hammers above the melody strings suitably mounted and arranged in rows consisting each of a small bar with downward extension on one end adapted to strike the string, an elastic metal strip secured with one end to the top surface of the bar opposite its extension leaving its middle portion free, and a layer of felt on the top surface of said elastic strip.

6. In a stringed musical instrument of the type described, melody strings, a set of flexible hammers above the melody strings suitably mounted and arranged in rows consisting each of a thin bar with downward extension on one end adapted to strike a string, an elastic metal strip secured with one end to the top surface of the bar opposite its extension leaving its middle portion free, and a layer of felt on the top surface of said elastic strip in combination with a corresponding set of keys located above the hammers and having each an adjustable screw in its lower portion so arranged that



the downward head of the screw strikes against the felt of the hammer above the inner end of the bar.

7. In a stringed musical instrument of the type described, melody strings, an attachment on the sounding board above the melody strings comprising adjustable keys, flexible hammers below said keys and above

the melody strings, and a damper near the end of said strings and the attachment.

Signed at New York, N. Y., this 8th day of January, 1910.

FREDERICK MENZENHAUER.

Witnesses:

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