

No. 630,910.

Patented Aug. 15, 1899.

J. MONIGHAN & H. BRAINARD.

PIANO STRING LOOP MACHINE.

(Application filed Nov. 30, 1898.)

(No Model.)

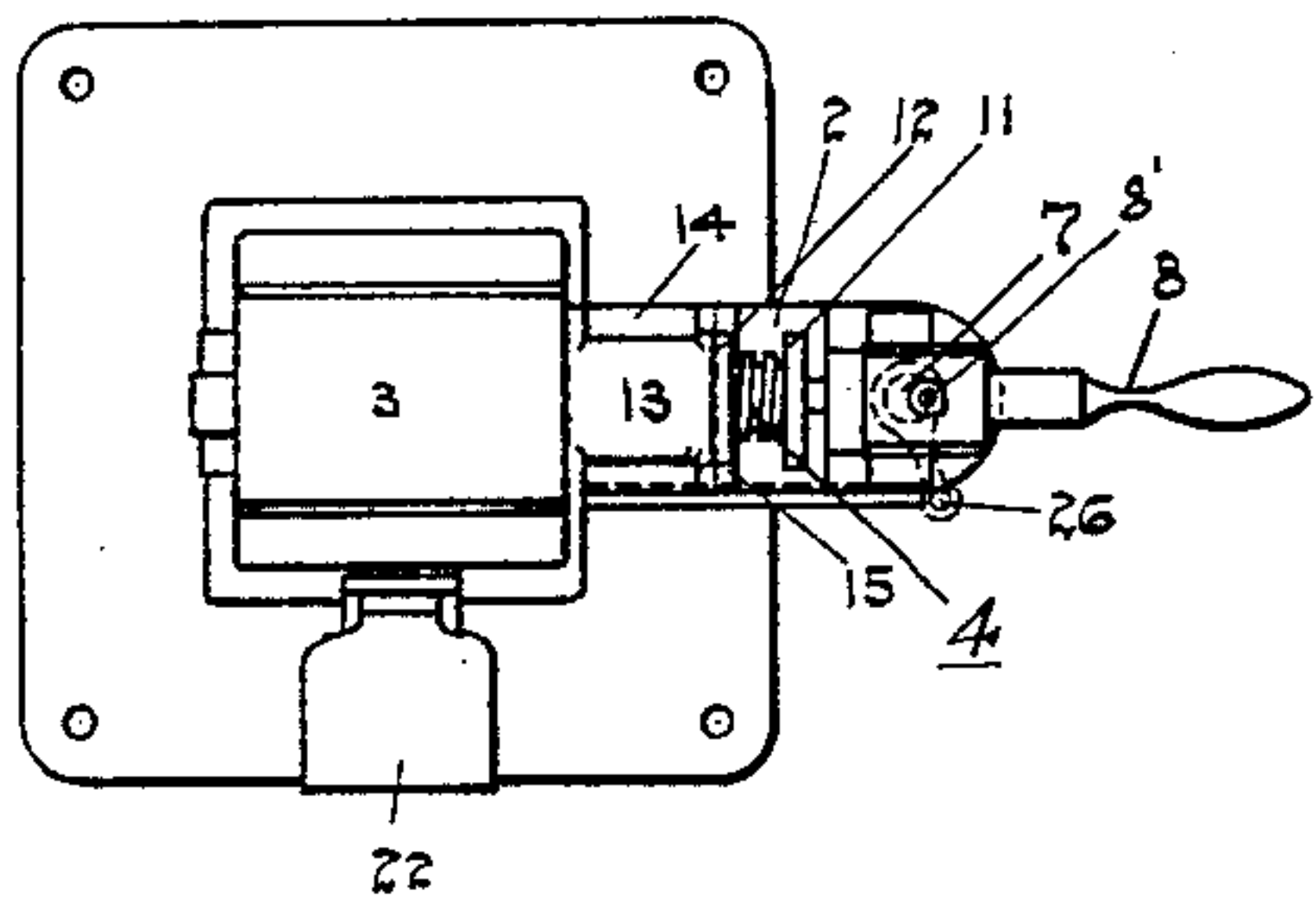


FIG. 1.

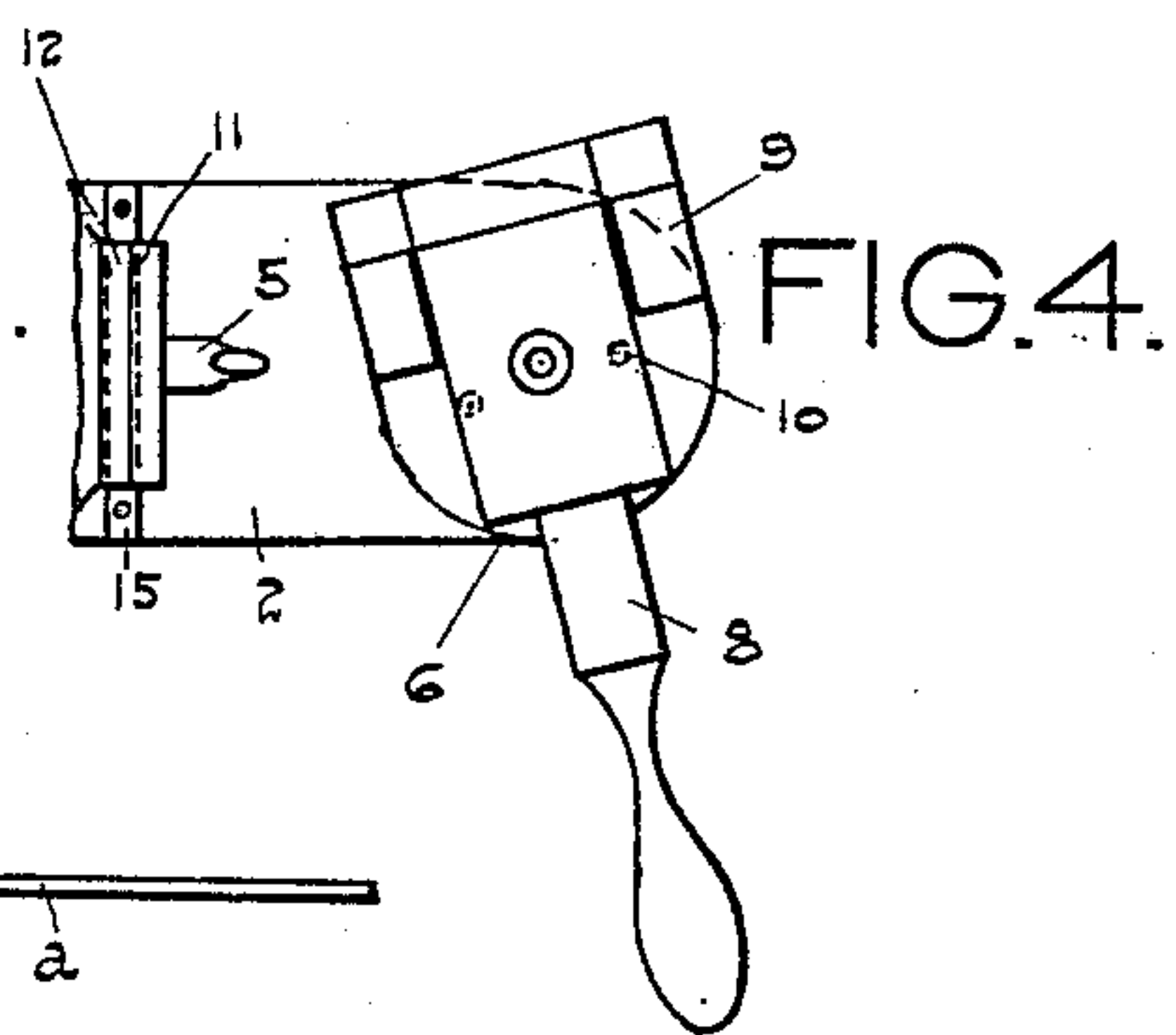


FIG. 4.



FIG. 6.

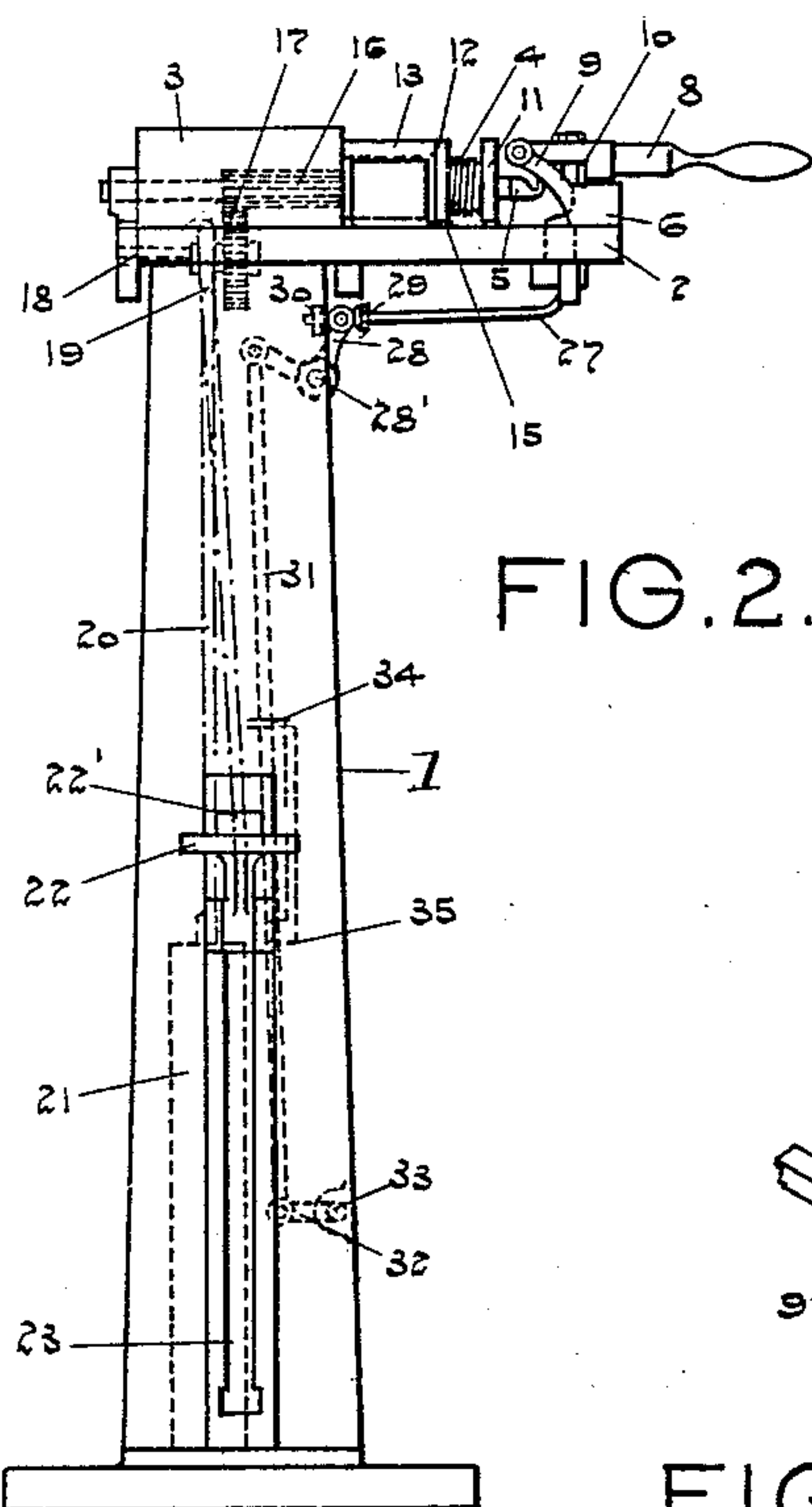


FIG. 2.

FIG. 3.

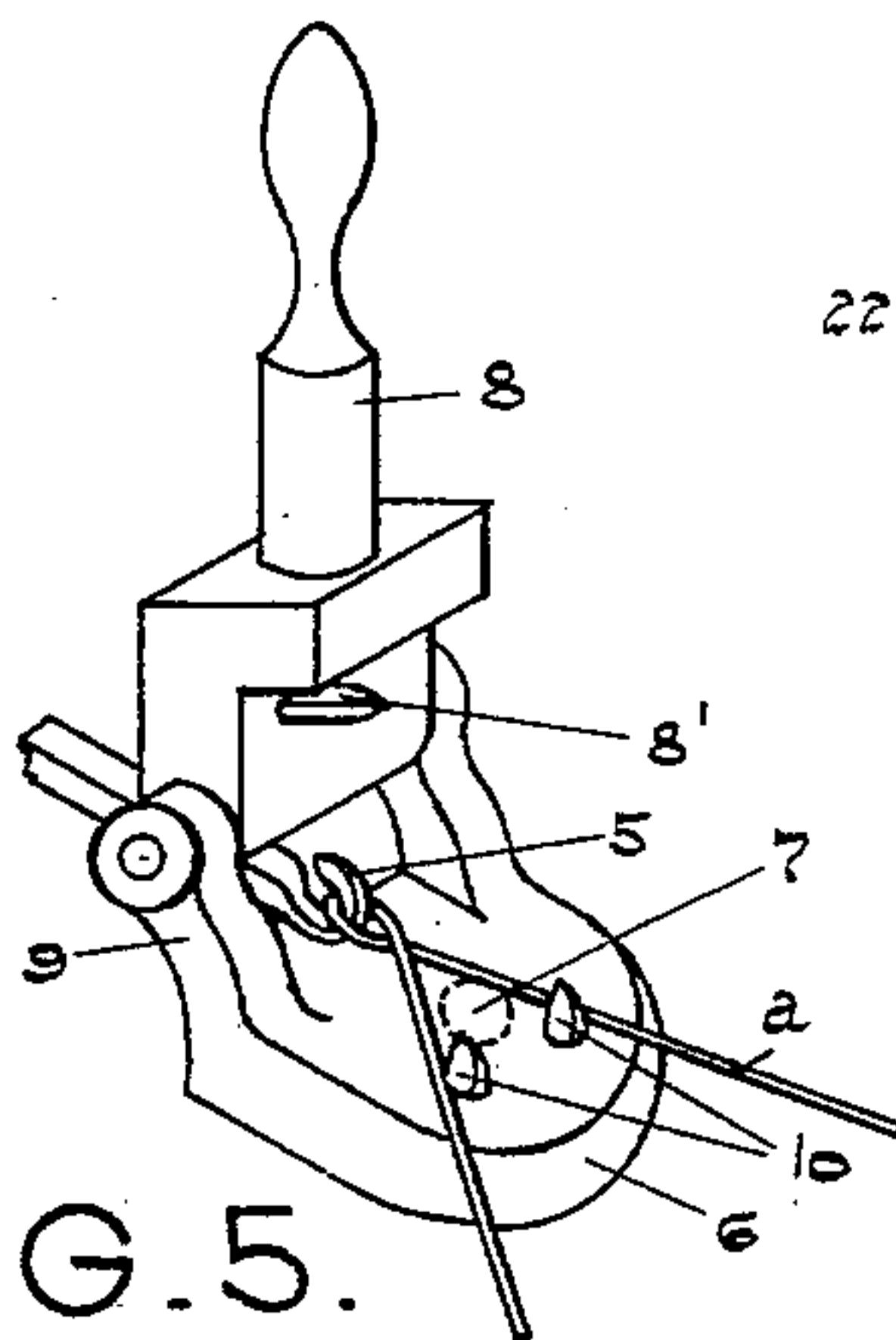
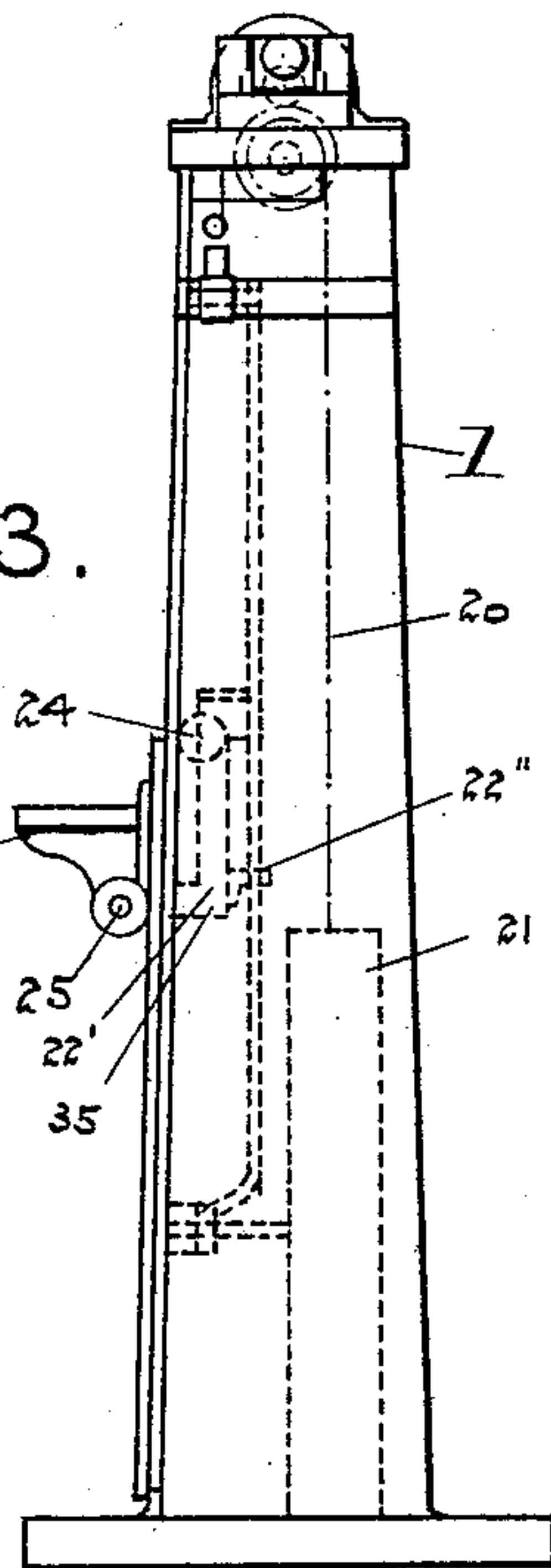


FIG. 5.



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# UNITED STATES PATENT OFFICE,

JOHN MONIGHAN AND HENRY BRAINARD, OF CHICAGO, ILLINOIS; SAID  
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## PIANO-STRING-LOOP MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,910, dated August 15, 1899.

Application filed November 30, 1898. Serial No. 697,848. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN MONIGHAN and HENRY BRAINARD, citizens of the United States of America, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Piano-String-Loop Machines, of which the following is a specification.

Our invention relates to the manufacture of piano-strings, and particularly to a device for making the loop at one end of the main wire.

The main objects of our invention are to facilitate the making of such loop, to insure substantial uniformity of the loops on different strings, and to insure substantial uniformity of the twist and wind inward of said loops. We accomplish these objects by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a top plan of a machine constructed according to our invention. Fig. 2 is a side elevation, and Fig. 3 a front elevation, of same. Fig. 4 shows the position of the guide-block 6 when pulled over by the arm 27. Fig. 5 is a perspective view of the parts acting directly upon the wire *a* with the lever 8 raised. Fig. 6 shows the finished loop.

The frame or casing 1 has a platform 2 secured to the top. A box 3 is secured upon the platform and has a spindle 4 journaled therein and terminating in a hook 5. In front of said spindle a guide-block 6 is pivoted to the platform at 7. A lever 8 is fulcrumed on the arms 9 on the block. The block 6 is provided with upwardly-projecting lugs 10, which serve to separate the ends of the wire at an angle from the hook 5, the wire being held down upon the block by the lever 8. The spindle 4 is longitudinally movable in the box 3 and has a shoulder 11 thereon which abuts against the shoulder 12 at the inner limit of such longitudinal movement. The spindle is threaded in the sleeve 13, which is revoluble in the casing 14 on the platform and is held against longitudinal movement by its shoulder 12. The spring 15 by frictional contact prevents the sleeve from revolving until the shoulder 11 of the spindle abuts against the shoulder 12 of the sleeve. The spindle has the gear-teeth 16, within the box 3, meshing

with the gear-wheel 17, which is rigid on the shaft 18. The sprocket-wheel 19 is also rigidly mounted on the shaft 18. The sprocket-chain 20 extends over the wheel 19 and is attached at one end to the weight 21 and at the other end to the shoe 22' at 22". The step 22 is rigid on the shoe 22', which is slidingly supported in the slot 23 in the side of the casing 1. The shoe is held in proper position by the rollers 24 and 25, mounted thereon.

The guide-block 6 has the arm 26 secured to same and pivoted to the arm 27. The arm 27 passes through a slot in the outer arm of the bell-crank 28 and is held in engagement with same by the nuts 29 and 30. The bell-crank is pivoted at 28' in a slot in the front of the casing 1.

The inner arm of the bell-crank is pivoted to the arm 31, which is pivoted at its lower end to the arm 32. The arm 32 is pivoted to the frame at 33. A shoulder 34 is provided on the arm 31 above the shoe 22'.

The operation of the machine is as follows: The parts are normally in the position shown in Figs. 1, 2, and 3. The operator raises the lever 8 and first makes a loop by bending the wire around one of the lugs 10, so that the ends of the wire cross. The loop is then put on the hook 5 and the ends of the wire are passed outside of and against the lugs 10. The lever is then depressed upon the wire, thus holding same in proper position. The lug 8' intervenes between the ends of the wire *a* when the lever is down. The operator then depresses the step, when the spindle is revolved through the action of the gear-wheel 17. The threaded part of the spindle works back in the sleeve 13 until the shoulder 11 strikes the shoulder 12, when the spindle continues to revolve without moving longitudinally, the sleeve 13 revolving with the same.

The length of the chain from the wheel 19 to the point of attachment to the shoe 22' is so arranged that when the shoulders 11 and 12 meet the lower part of the shoe at 35 will strike the arm 32, and thus through the action of the bell-crank turn the guide-block to the position shown in Fig. 4.

It will be seen that as the spindle revolves and at the same time moves away from the guide the wire is drawn through the guide,



making a long twist, until the spindle ceases to move longitudinally. The guide is then turned to the position shown in Fig. 4, so that one end of the wire, being the main part of the string, is substantially in alinement with the spindle, while the other end is nearly at right angles to the same, so that the twist at this part will be very close, forming a coil of the short end around the main part of the wire. The lever is then raised and the wire removed. The weight 21 then operates through the chain 20 to raise the step and also turn back the spindle to its former position. The upper part of the shoe 22', striking the shoulder 34 on the arm 31, raises same, and thus returns the guide-block 6 to its former position.

It will be seen that the details of construction of our device may be altered in numerous ways without departing from the spirit of our invention.

What we claim, and desire to secure by Letters Patent, is—

1. A piano-string-loop machine, comprising a frame; a revoluble spindle thereon having a hook for engaging the wire, and having a limited longitudinal movement; a guide on said frame for separating the ends of the wire at an angle from said hook; mechanism for simultaneously revolving said spindle and urging the same toward the limit of its longitudinal movement away from said guide; and mechanism for changing the relative position of the guide and spindle transversely to the line of such longitudinal movement, when the spindle is at said limit, substantially as described.

2. A piano-string-loop machine, comprising a frame; a revoluble spindle thereon having a hook for engaging the wire, and having a limited longitudinal movement; a guide-block pivoted on said frame in front of said hook, on an axis transverse to the line of such longitudinal movement, and adapted to separate the ends of the wire at an angle from said hook; mechanism for simultaneously revolving said spindle and urging same toward the limit of its longitudinal movement away from said guide; and mechanism for turning said guide-block on its axis when the spindle is at said limit; substantially as described.

3. A piano-string-loop machine, comprising a frame; a revoluble spindle thereon having a hook for engaging the wire, and having a limited longitudinal movement; a guide on said frame for separating the ends of the wire at an angle from said hook; mechanism for urging said spindle toward the limit of its longitudinal movement away from said guide; mechanism for changing the relative position of the guide and spindle, transversely to the line of such longitudinal movement, when

the spindle is at said limit; and mechanism adapted to revolve the spindle during such longitudinal movement, and after such change of position, and to limit its revolution to a fixed number before, and a fixed number after such change of position; substantially as described.

4. A piano-string machine, comprising a frame; a revoluble spindle thereon having a hook for engaging the wire, and having a limited longitudinal movement; a guide-block pivoted on said frame in front of said hook, on an axis transverse to the line of such longitudinal movement, and having guideways thereon for separating the ends of the wire at an angle from said hook; a lever fulcrumed on said block for retaining the wire in said guideways; mechanism for urging the spindle toward the limit of its longitudinal movement away from said guide-block; mechanism, independent of said lever, for turning the guide-block on its axis when the spindle is at said limit; and mechanism adapted to revolve the spindle during such longitudinal movement, and after the turning of said guide-block, and to limit its revolutions to a fixed number before, and a fixed number after the turning of said guide-block; substantially as described.

5. A piano-string-loop machine, comprising a frame; the revoluble spindle thereon having a hook for engaging the wire, and having a limited longitudinal movement; the guide-block pivoted on said frame in front of said hook, on an axis transverse to the line of such longitudinal movement; the lever fulcrumed on said block; and the mechanism for actuating said spindle and guide-block, substantially as and in the manner specified.

6. A piano-string-loop machine, comprising a frame; a revoluble spindle thereon having a hook for engaging the wire; a guide on said frame for separating the ends of the wire at an angle from said hook; mechanism for revolving said spindle; and mechanism for exerting a tension on the wire between the hook and said ends, during such revolution; said guide and tension mechanism being adapted to hold said ends in proper position to form a twist of said wire, toward the hook, during the first part of the revolution of said spindle, and a coil, of less pitch than said twist, of one of said ends upon the other, at the last part of said revolution.

Signed by us, at Chicago, Illinois, this 12th day of November, 1898.

JOHN MONIGHAN.  
HENRY BRAINARD.

Witnesses:

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