

(No Model.)

4 Sheets—Sheet 1.

H. LE R. KEMP.
SHOE TIP PUNCHING MACHINE.

No. 573,274.

Patented Dec. 15, 1896.

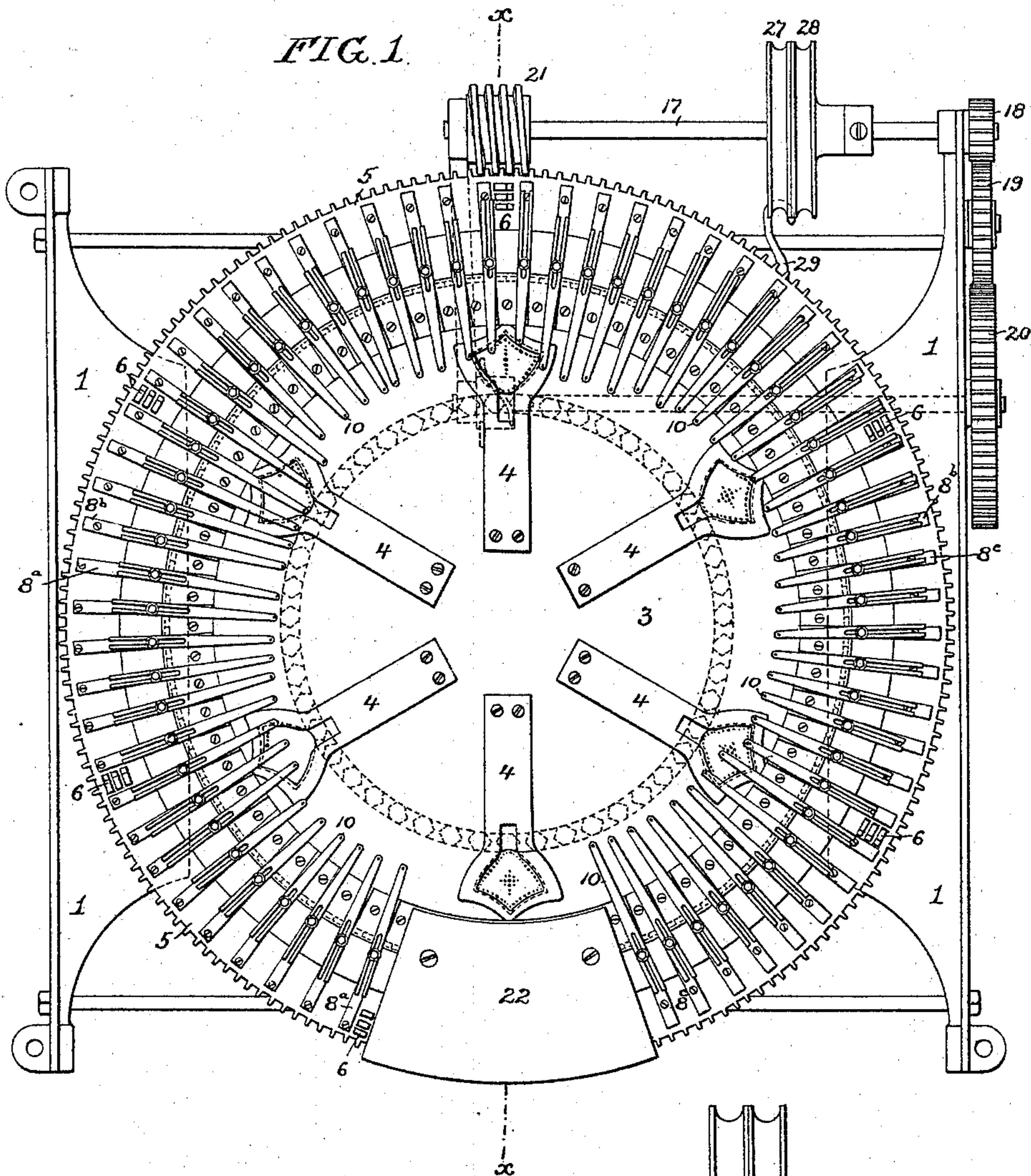


FIG. 3.

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Frank E. Bechtold

Inventor:
Horace LeRoy Kemp
by his Attorneys

Howson & Howson

(No Model.)

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FIG. 4.

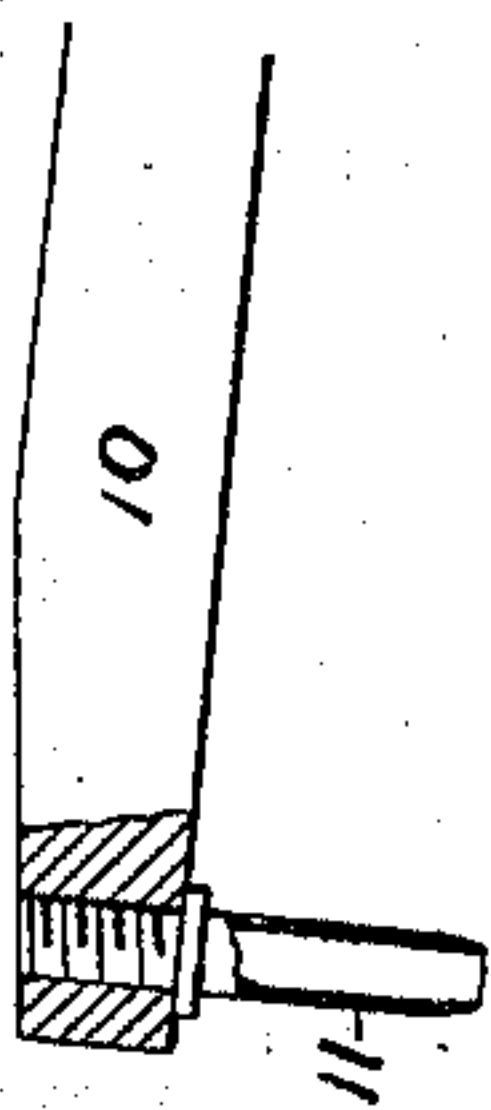
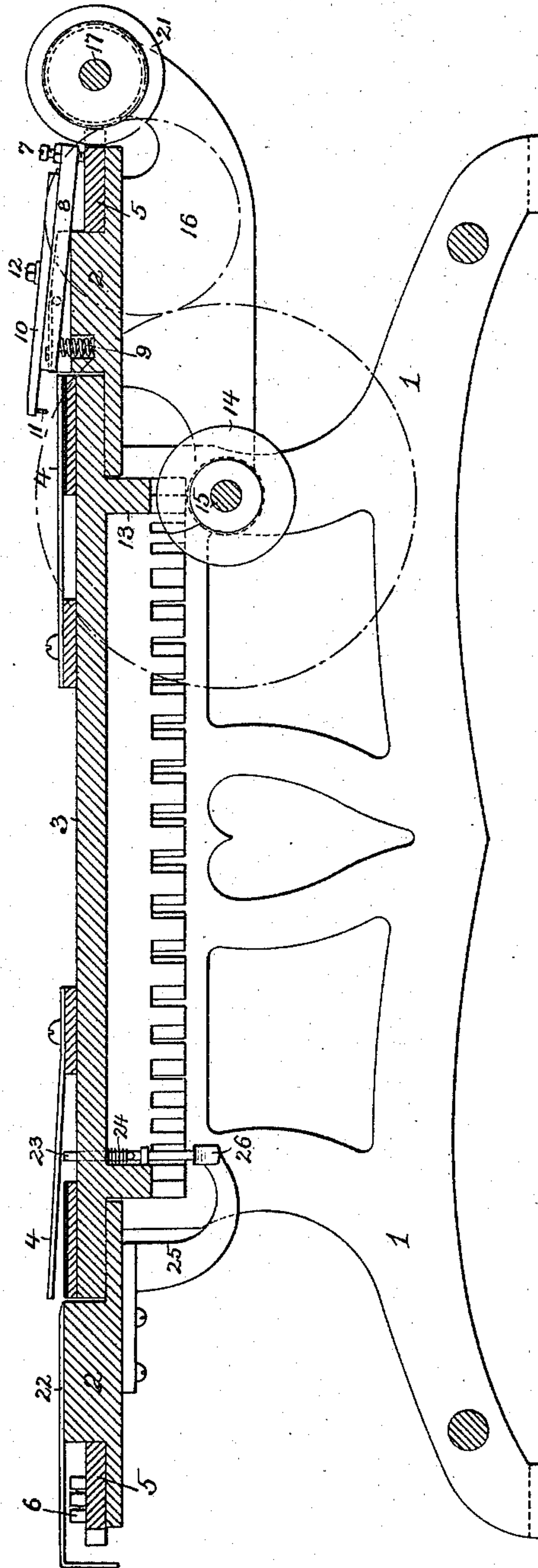


FIG. 2.



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FIG. 5.

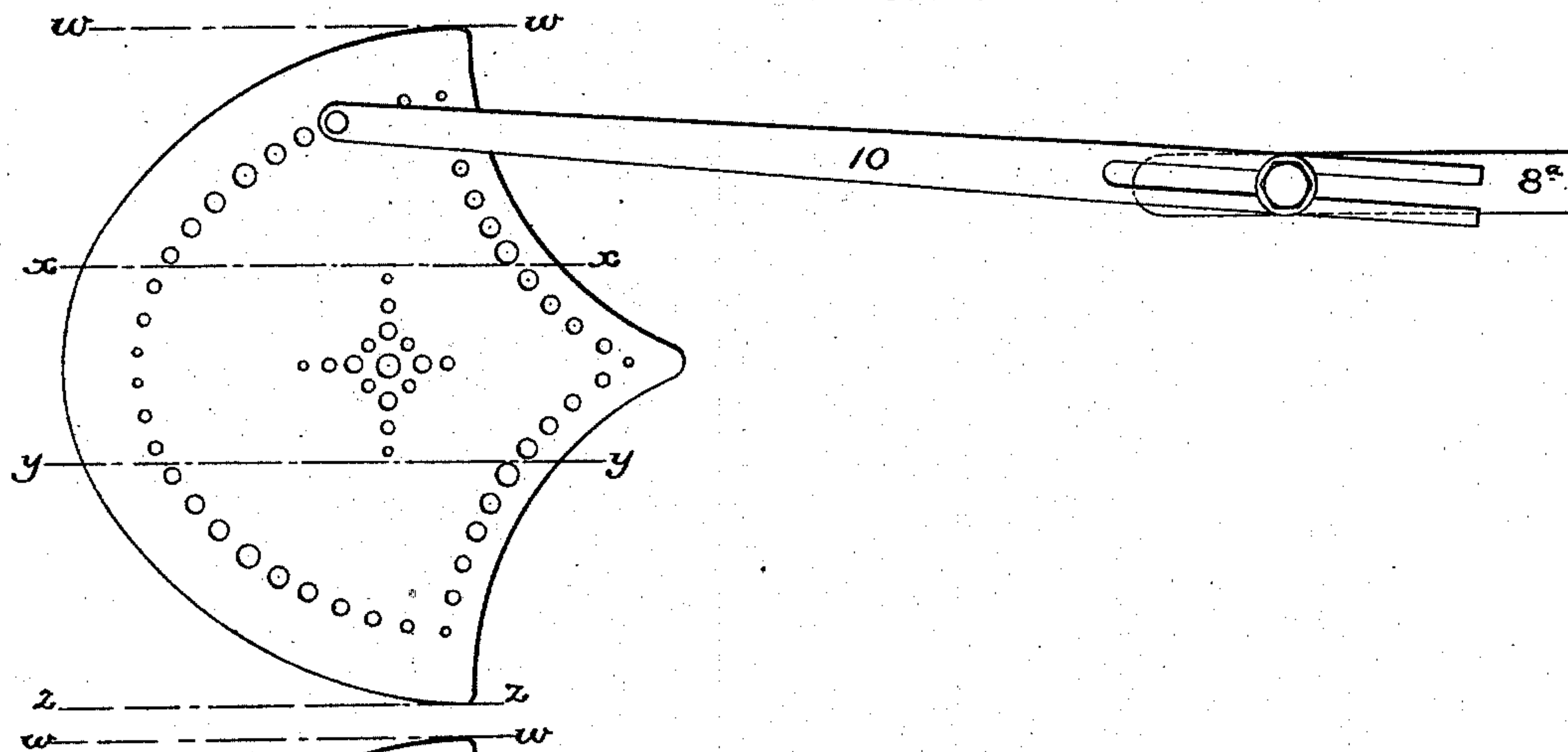


FIG. 6.

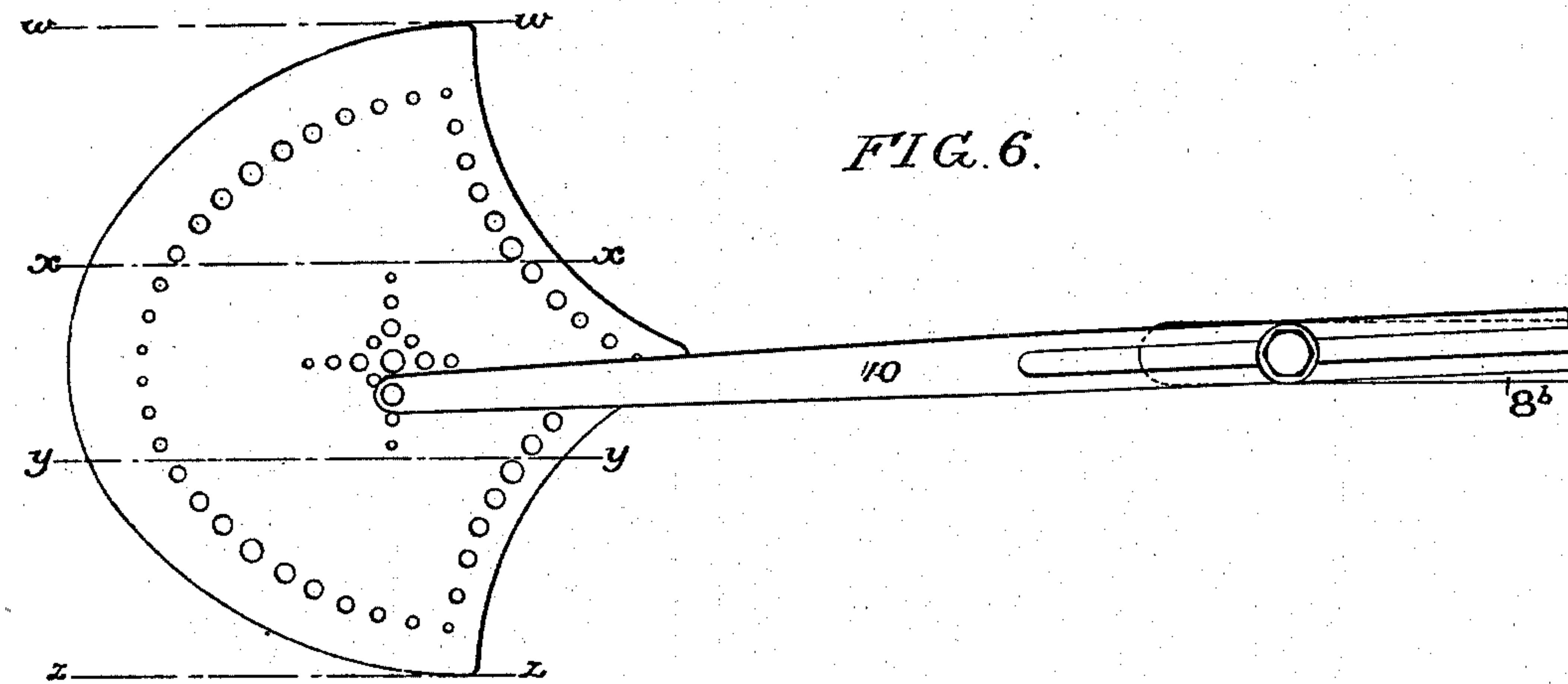
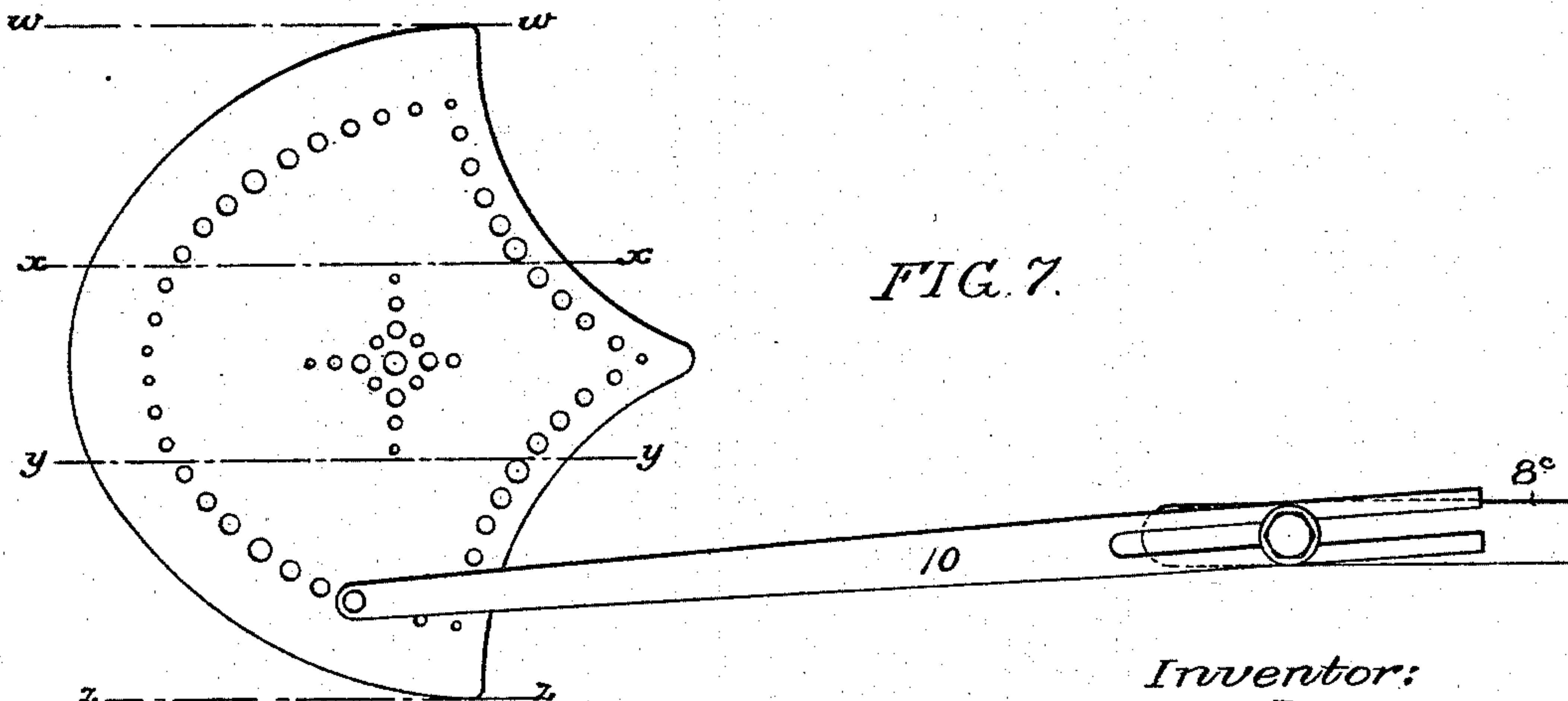


FIG. 7.



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FIG. 8.

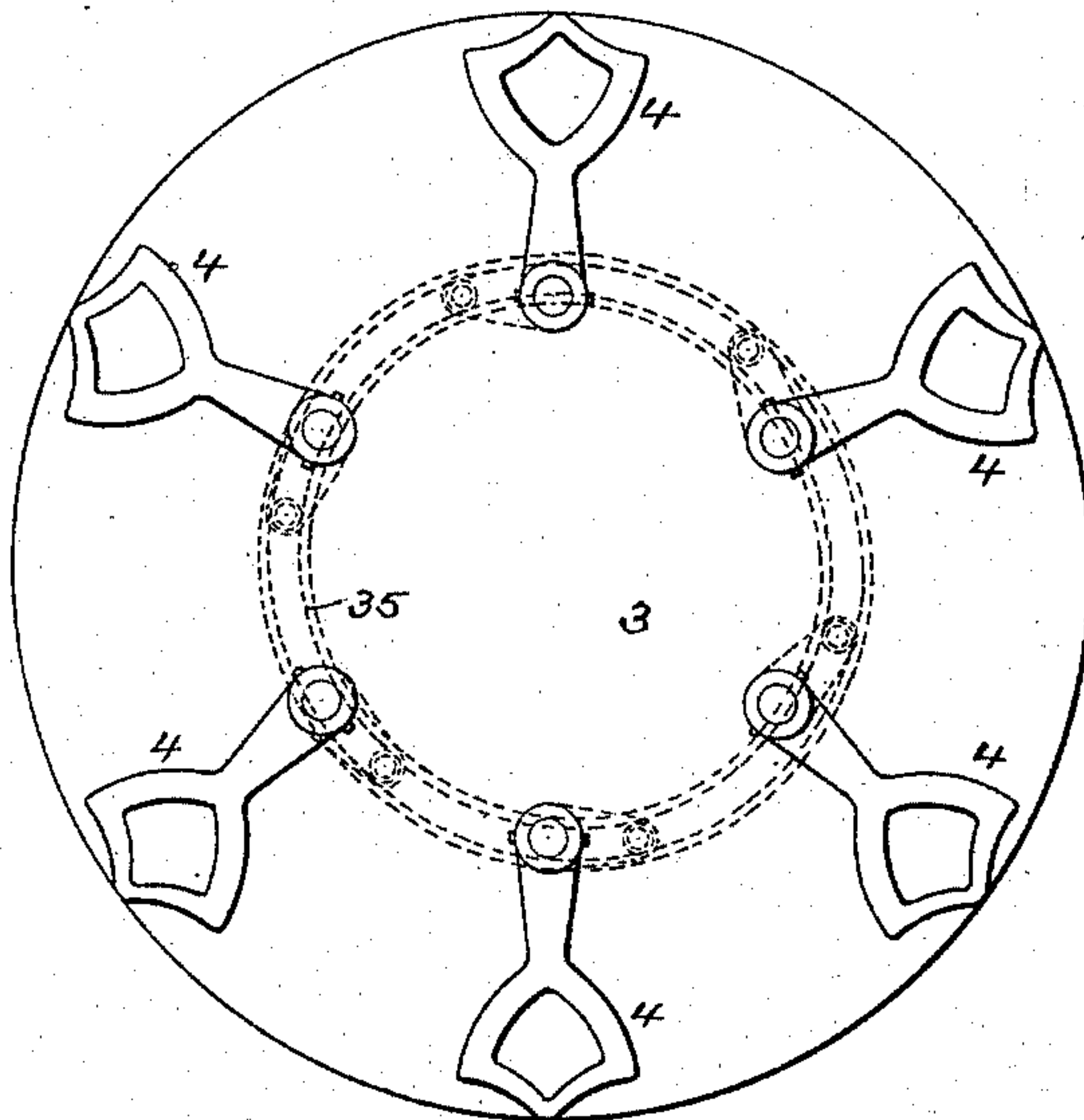
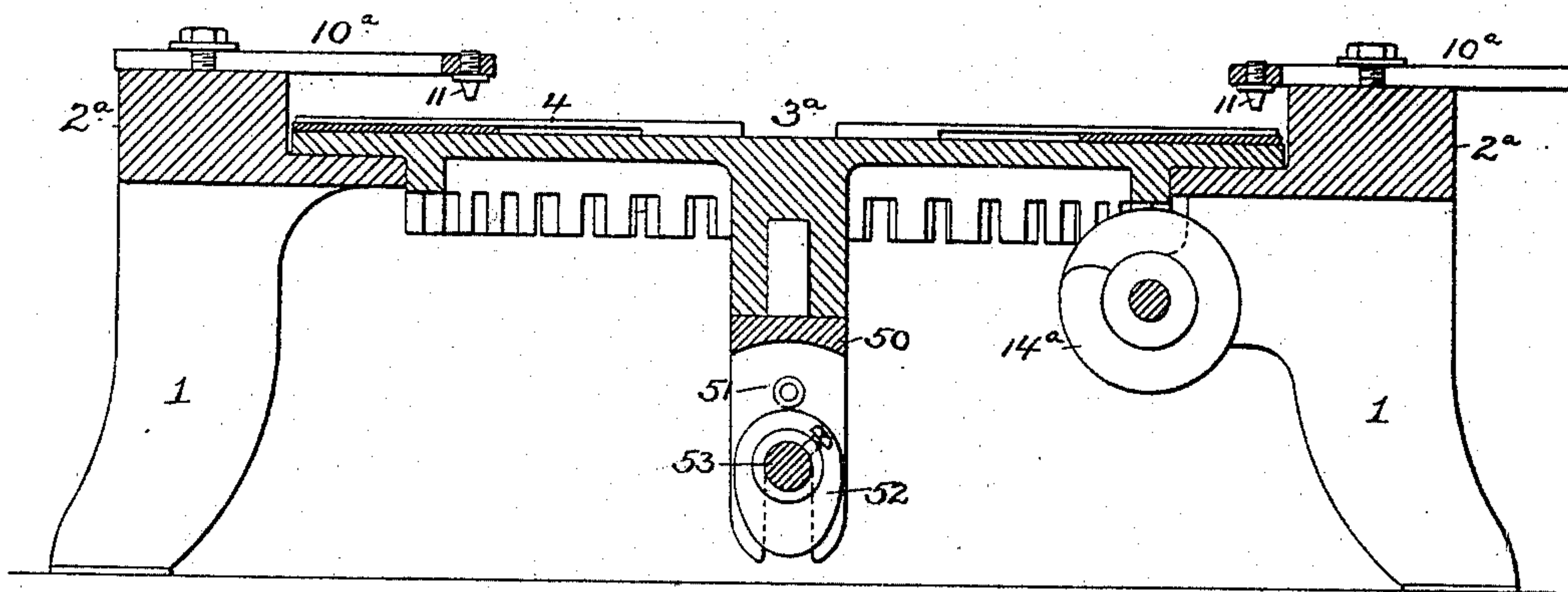


FIG. 9.



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UNITED STATES PATENT OFFICE.

HORACE LE ROY KEMP, OF CAMDEN, NEW JERSEY.

SHOE-TIP-PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,274, dated December 15, 1896.

Application filed March 27, 1896. Serial No. 585,117. (No model.)

To all whom it may concern:

Be it known that I, HORACE LE ROY KEMP, a citizen of the United States, and a resident of Camden, New Jersey, have invented certain Improvements in Shoe-Tip-Punching Machines, of which the following is a specification.

The object of my invention is to construct a shoe-tip-punching device or machine in which a series of tips may be acted upon simultaneously and in which also the punches are adjustable, so that they may be made to conform to any desired pattern.

In the accompanying drawings, Figure 1 is plan view of a shoe-tip-punching machine constructed in accordance with my invention. Fig. 2 is a sectional view of the same on the line $x x$, Fig. 1, but on a larger scale, but omitting certain parts. Fig. 3 is a detached view of a stop mechanism forming part of the machine. Fig. 4 is a side view, partly in section, of part of one of the punch-bars and its punch. Figs. 5, 6, and 7 are diagrams illustrating one of the features of the invention; and Figs. 8 and 9 are views illustrating different modifications of the invention.

In the machine shown in Figs. 1 and 2, 1 represents a suitable supporting-frame carrying a fixed ring 2, upon which is mounted a central disk 3, constituting a work-table, this disk carrying a series of tip carriers or clamps 4, equidistantly located around the disk and serving to confine to the latter a series of shoe-tips. These shoe-tips are usually composed of enameled leather and have groups or lines of perforations formed therein to produce ornamental patterns or borders, and the tips are usually punched by means of dies having punches fixedly disposed thereon to produce the desired pattern. In carrying out my invention, however, I provide adjustable punches which can be so disposed upon their carrier as to form any desired design or pattern, whereby the same machine is adapted for the production of shoe-tips having widely-different patterns or designs formed thereon.

Mounted on the ring 2 is a ring 5, which carries cams 6, adapted to act upon set-screws 7, carried by levers 8, the latter being suitably pivoted to the ring 2, and being acted

upon by springs 9, tending to force the set-screws 7 downward toward the upper face of the ring 5.

Upon the top of each of the levers 8 is mounted a punch-bar 10, which carries at its inner end a punch 11, these punches being of any desired shape, depending upon the character of the perforations to be produced, and being preferably detachable, so as to be removable and replaceable, whereby substitutions can be readily effected.

Each of the punch-bars 10 is slotted longitudinally for the reception of the stem of a confining-bolt 12, whereby it is secured to the lever 8. Hence each punch-bar can be moved inward and outward on its lever 8, and can also be swung laterally on said lever with the bolt 12 as a pivot. As a consequence of this adjustment the punch carried by the inner end of the punch-bar can be caused to assume any desired position over the surface of a tip confined by a tip-carrier 4, and by properly disposing the punches and operating them in succession as a tip is carried forward beneath the same a complete pattern can be punched by the time the tip has made the complete round of the series of punches.

The work-table 3 has a depending flange 13, recessed at the lower edge, so as to form a series of teeth, with which engages a worm 14 on a shaft 15, adapted to suitable bearings in a bracket 16, depending from the rim 2, said worm 14 being so formed, as shown by dotted lines in Fig. 1, that it will impart intermittent forward movements to the work-table 3 and will lock the same in position between such movements. To suitable bearings in the bracket 16 is adapted another shaft, 17, which is geared, by means of spur-wheels 18, 19, and 20, to the shaft 15, and said shaft 17 has a worm 21, which meshes with the teeth formed around the periphery of the cam-ring 5.

There are as many cams or sets of cams on the cam-ring 5 as there are tip-carriers on the work-table 3, and the speed of the ring 5 in respect to the movements of the work-table is so regulated that as soon as the tip-carriers become stationary after a forward movement of the work-table a punch corresponding to each tip-carrier (except the one referred to hereinafter) will be depressed by the action of a cam 6 upon the lever carrying the bar of

said punch. Hence on each stoppage of movement of the work-table a perforation will be made in each of the series of tips acted upon, the movements of the work-table taking place while the cams 6 are traveling from lever to lever of the series mounted upon the ring 2. In the present instance I have shown six tip-carriers, but it will be evident that more or less than this number may be used, as desired.

At one point on the ring 2, corresponding to the front of the machine, where the operator sits, a number of levers and punches are omitted, and the ring 2 is surmounted by a table 22, the machine being so designed that when a tip-carrier reaches a position in front of this table after having completed the round of the punches the tip carried thereby will be completely perforated, so that it can be removed and a fresh or unperforated tip inserted in its place.

The tip-carriers are preferably constructed so as to have a certain amount of elasticity and so as normally to press upon the tip and hold it in position upon the work-table, and in order to provide for the automatic release of each tip as it is brought in front of the table 22 I mount on the work-table 3, underneath each tip-carrier 4, a rod 23, which is acted upon by a spring 24, tending to depress it, so that normally it does not interfere with the descent of the clamp upon the tip. Mounted upon the under side of the ring 2, however, in a position corresponding with that of the table 22 is a bracket 25, carrying at its inner end a cam 26, and when each tip-carrier arrives in front of the table 22 its rod 23 rides upon this cam 26, so as to be lifted thereby and thus raise the tip-carrier, as shown at the left-hand side of Fig. 2, the carrier closing upon the freshly-inserted tip as soon as the rod 23 leaves the cam 26.

It is advisable to automatically stop the machine as soon as a tip-carrier arrives in front of the table 22, and in order to effect this result I employ a stop-motion device. (Illustrated in Fig. 3.)

On the driving-shaft 17 is a fast pulley 27 and a loose pulley 28, the driving-belt being directed to one or other of these pulleys by means of a belt-controlling lever 29, which is suitably hung to the ring 2 and is acted upon by a spring 30, tending to move it so as to shift the belt from the fast pulley 27 onto the loose pulley 28 in order to stop the machine. When the belt is upon the fast pulley, however, the lever is held in the position shown in said Figs. 1 and 3 by means of a retaining-lever 31, which is held in engagement with the belt-controlling lever 29 by means of a spring 32.

On the depending flange 13 of the work-table 3 are a series of lugs or projections 33, one for each tip-carrier, and when a carrier is brought into position in front of the table 22 the lug 33 corresponding to said carrier strikes the inner end of the retainer-lever 31

and trips the same, so as to release the belt-controlling lever 29, the latter thereupon, under the influence of the spring 30, being immediately moved so as to shift the belt onto the loose pulley.

When the perforated tip has been removed from the carrier and a fresh tip inserted in its place, the belt-controlling lever 29 is restored to its normal position by means of a treadle connection or in any other available manner, so as to again start the machine, the lug 33 thereupon passing from beneath the lever 31 and permitting the latter to again engage with the lever 29, so as to hold the latter in position until it becomes necessary to again stop the machine.

If the successive levers 8 of the series were disposed on radial lines passing through the centers of the tip-carriers in their successive positions of advancement, excessive lateral deflection of some of the punch-bars would be required, the extreme lateral deflection being equal to half the width of the space occupied by the outermost portions of the pattern on the tip, and this might in some cases cause undue twisting or torsional strain upon the punch-bars. I therefore propose to divide the series of levers into sets, preferably three in number, the levers of one set being disposed upon lines radiating from one of the outer sections of the tip in its successive positions of advancement, the levers of the second set being disposed on lines radiating from the central section of the tip, and the levers of the third set being disposed on lines radiating from the opposite outer section of the tip. Thus, upon reference to Figs. 5, 6, and 7, the punch-bars carried by the levers 8^a of the first set will only cover a range between the lines *w* and *x*. Hence the extreme lateral deflection of any of said punch-bars will only be to the extent of half the distance between these two lines. In like manner the punch-bars carried by the set of levers 8^b will only range between the lines *x* and *y*, and the punch-bars carried by the set of levers 8^c will only range between the lines *y* and *z*. Hence extreme lateral deflection of any of the punch-bars with its accompanying objections will be prevented. This disposal of the punch-levers requires the employment of a set of cams on the cam-ring 5 for each of the tip-carriers, as shown in Fig. 1, the cams of the set being disposed at different distances from the center of the work-table, as shown in Figs. 1 and 2, and the outermost cam of each set being adapted to act upon one set of levers, say the levers 8^a, while the intermediate cam acts upon the levers 8^b and the innermost cam upon the levers 8^c.

The same result might be attained by pivoting the tip-carriers and controlling them by means of a suitable cam beneath the work-table, as shown, for instance, at 35, Fig. 8, so as to cause them to swing laterally as they are carried around by said table, and in this case the movement of the tip-carriers

may be wholly relied upon to govern the lateral position of the perforations formed by the successive punches, each of the punch-bars being in line with its lever and the adjustment being in radial lines only so as to regulate the position of the perforation nearer to or farther from the axis of the work-table.

In Fig. 9 I have illustrated a machine in which, instead of employing a work-table having a rotary movement only, in connection with vertically-moving punches, I have adopted punches which occupy a fixed vertical position and a work-table which has a vertically-reciprocating motion as well as a rotating one. In this case the ring 2^a has punch-bars 10^a mounted directly upon it, these punch-bars being slotted longitudinally, so as to provide for radial adjustment, and the rotating work-table 3^a is mounted upon a slide 50, which has an antifriction-roller 51, acted upon by a cam 52 on a shaft 53, this cam being adapted to impart vertical reciprocations to the work-table 3^a while the same is locked by the worm 14^a, so as to be incapable of rotation, the forward movements of the table being imparted to it while it occupies the depressed position, so that the tips and their carriers are free from the punches carried by the bars 10^a. In this case the punches may be arranged in groups, so that on each upward movement of the work-table a series of perforations will be formed in each of the tips carried thereby, thereby lessening the number of movements of the table necessary to effect the formation of a complete pattern on each tip.

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

1. The combination in a shoe-tip-punching machine, of a work-table having thereon a series of tip-clamps, with a punch-carrier having punches adjustable thereon so as to form different patterns, a series of such punches occupying the space between the centers of successive tip-clamps, and means whereby the punches are caused to act upon the tips.

2. The combination in a shoe-tip-punching machine, of a work-table having thereon a series of tip-clamps, means for imparting to said table intermittent movements of partial rotation, a punch-carrier having punches adjustable thereon so as to form different patterns, a series of such punches occupying the space between the centers of successive tip-clamps, and means whereby the punches are caused to act upon the tips.

3. The combination in a shoe-tip-punching machine, of a work-table having thereon a series of tip-clamps, a punch-carrier having punches adjustable thereon so as to form different patterns, a series of such punches occupying the space between the centers of successive tip-clamps, and means whereby punches, one of each series, are operated simultaneously as the tips are brought under the same.

4. The combination in a shoe-tip-punching machine, of a work-table having thereon a series of tip-clamps, means for imparting intermittent movements of partial rotation to said work-table, a punch-carrier having punches adjustable thereon so as to form different patterns, a series of such punches occupying the space between the centers of successive tip-clamps, and means for moving the punches in a plane at right angles to the plane of movement of the work-table.

5. The combination in a shoe-tip-punching machine, of a work-table having thereon a series of tip-clamps, a punch-carrier having punches adjustable thereon so as to form different patterns, a series of such punches occupying the space between the centers of successive tip-clamps, means whereby the punches are caused to act upon the tips, a toothed annular flange on the work-table, and a worm engaging said teeth and having a thread partly straight and partly inclined whereby it acts alternately to move the table and to lock the same.

6. A shoe-tip-punching machine in which are combined a punch-carrier having punches adjustable thereon, whereby they may be caused to conform to different patterns, a tip-carrying table movable so as to carry the tip past the punches of the series in succession, and a movable cam-carrier whereby the punches are successively operated.

7. A shoe-tip-punching machine in which are combined a punch-carrier having a series of levers hung thereon, a series of punch-bars adjustable longitudinally on said levers, means for operating the levers, a work-table having one or more tip-carriers, and means for moving said table whereby the tips are caused to pass under the punches in succession.

8. A shoe-tip-punching machine in which are combined a punch-carrier having levers hung thereto, punch-bars adjustable both longitudinally and laterally on said levers, means for operating said levers, and a movable work-table having one or more tip-carriers, whereby the tips are caused to pass under the punches in succession.

9. A shoe-tip-punching machine in which are combined a punch-carrier on which the punches are adjustable, whereby they may be caused to conform to different patterns, a moving tip-carrier whereby the tip is caused to pass under the punches in succession, and provision for causing the punches to act upon the tip when the latter is within range of the same, the punches being disposed in groups, and the punches of each group being adapted to act upon a limited area only of the tip.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE LE ROY KEMP.

Witnesses:

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