

(No Model.)

F. J. RUSSELL.
ELECTRIC VIBRATOR MECHANISM.

No. 547,034.

Patented Oct. 1, 1895.

Fig. 1,

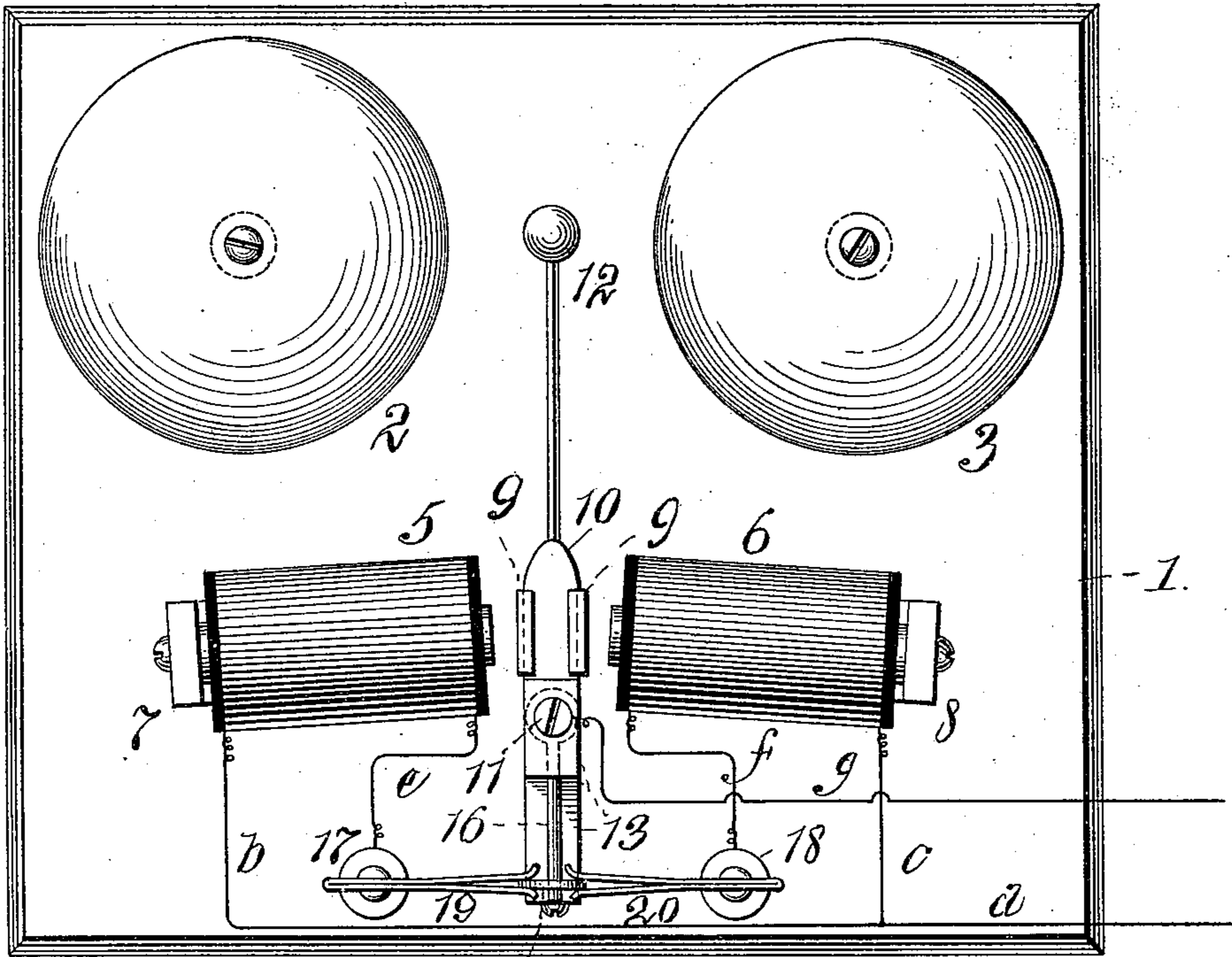


Fig. 2,

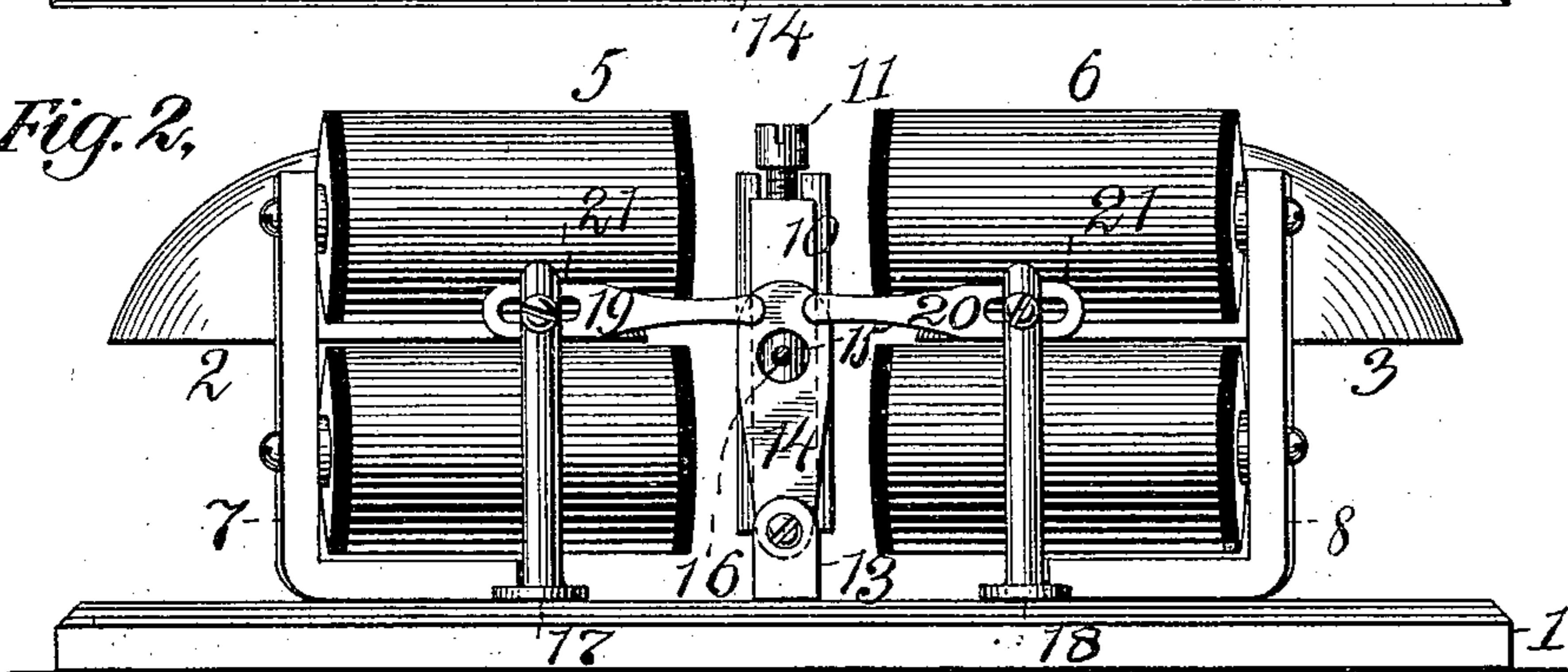
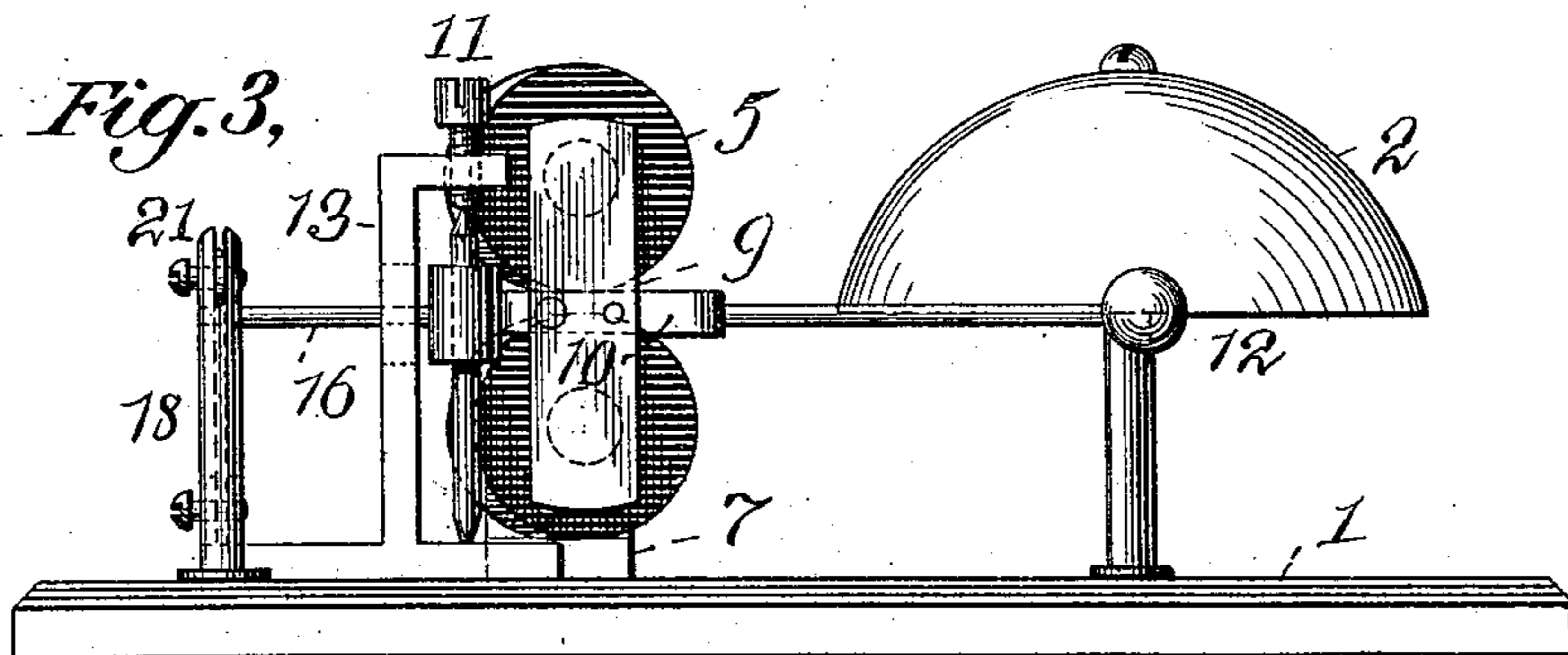


Fig. 3,



Witnesses:-

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Inventor:-

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By
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UNITED STATES PATENT OFFICE.

FRANK J. RUSSELL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
HORACE SEE, OF SAME PLACE.

ELECTRIC VIBRATOR MECHANISM.

SPECIFICATION forming part of Letters Patent No. 547,034, dated October 1, 1895.

Application filed April 15, 1895. Serial No. 545,679. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. RUSSELL, of the city, county, and State of New York, have invented a new and useful Improvement in Electric Vibrator Mechanism, of which the following is a specification.

The invention relates to that class of electric vibrator mechanism in which the energizing-current is not interrupted during operation; and it consists in the construction and arrangement of said mechanism, as more particularly hereinafter pointed out in the claim.

In the accompanying drawings, Figure 1 is a front elevation; Fig. 2, a view from below; and Fig. 3 is a side view looking at the polar end of one of the electromagnets, the other electromagnet being removed.

Similar numbers and letters of reference indicate like parts.

1 is any suitable support, upon which are secured the two gongs 2 and 3.

5 and 6 are electromagnets supported upon fixed brackets 7 and 8.

10 is a vibrating armature, having two plates 9, of inductive material, disposed between the facing poles of the magnets 5 and 6. This armature is pivoted at 11 and carries the bell-hammer 12, which when the armature is vibrated on its pivot 11 strikes alternately the gongs 2 and 3. The bracket 13, which carries the armature 10, has pivoted to it a plate 14, near the extremity of which is a circular opening 15. A rod 16, upon the armature 10, enters this opening; but the diameter of said rod 16 is considerably smaller than the diameter of the opening, as shown in Fig. 2.

Supported upon standards 17 and 18 are double leaf-springs 19 20, the ends of which are flared. Between the parts of these leaf-springs enters the plate 14. The springs 19 and 20 are slotted, as shown at 21, and are connected to the standards 17 and 18 by screws, so that said springs may thus be adjusted in the direction of their own length.

The circuits in this apparatus proceed from the source of electricity by wire *a*, thence by branch wires *b c* to and through the electromagnets 5 and 6, and thence by wires *e f* to the standards 17 18 and springs 19 20, and thence by armature-bracket 13 to the wire *g*, and so to the other pole of the source of electric-

ity. The armature 10 never normally stands in a precisely-midway position between the bells, such as shown in the drawings, but always by gravity inclines to one side or the other. If the switch-plate 14 is in its middle position, the armature is permitted so to incline by reason of the rod 16 having play in the large aperture 15. In that case the plate 14 will make contact with both springs 19 and 20 and the current will energize both magnets 5 and 6; but the armature will be most strongly attracted by that magnet toward which it is inclined, or, in other words, to the pole of which it stands the nearest, and in this way the operation of the vibrator will begin. In practice, however, I find that the armature does not come to rest when the current is shut off with the plate 14 in such a middle position, but that, on the contrary, the plate is always between the parts of one spring (19 and 20) or the other.

Suppose, for illustration, that the armature at the outset inclines by gravity to the right, and that then the switch-plate 14 is between the parts of the spring 19. The width of said switch-plate is such that when it is fully inserted between the parts of spring 19 it is withdrawn from between the parts of spring 20. The current, therefore, under the supposed conditions will, on establishment, pass only through the magnet 5, which will at once draw the armature 10 to the left; but as the armature moves to the left the rod 16 will move the switch-plate 14 gradually out from between the parts of spring 19 and simultaneously insert said plate between the parts of spring 20, so that by the time the armature has been drawn by magnet 5 a sufficient distance to the left (say to cause the hammer 12 to strike the gong 2) the current has been diverted by the plate 14 into the magnet 6, which now pulls the armature in the opposite direction, (say until the bell-hammer strikes the gong 3,) and thus the armature is set in rapid vibration.

It will be observed that the arrangement of the rod 16 in the large opening 15 serves a double purpose, the first being that the armature, as already stated, is permitted to incline a certain distance by gravity, thus insuring the beginning of the vibration by the differ-

ence between the pull of the magnets upon it, even when the plate 14 is in its middle position and grasped by both springs 19 and 20, and the second being that after the armature
5 has completed its stroke with the rod 16 bearing against one edge of the opening 15 in plate 14 on its return movement the rod plays across the said opening freely before it again starts said switch-plate in motion, and
10 that the armature has a certain acquired momentum before it begins to move the said switch-plate from between the parts of the spring in which it has been inserted, this momentum acting to overcome both the in-
15 ertia of the plate and the frictional resistance

of the parts of the spring bearing upon its faces.

I claim—

In an electric vibrator mechanism the combination of the electro-magnets 5 and 6, piv- 20
oted armature 10 having rod 16, movable plate 14 having an opening 15 into which said rod 16 enters, said opening being greater in diameter than said rod, contact springs 19 and 20 disposed on each side of said plate and cir- 25
cuit connections, substantially as described.

FRANK J. RUSSELL.

Witnesses:

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