No. 896,416. PATENTED AUG. 18, 1908.

# H. SCHÜTTE.

## TELEGRAPHONE.

APPLICATION FILED OCT. 10, 1907.

3 SHEETS—SHEET 1.

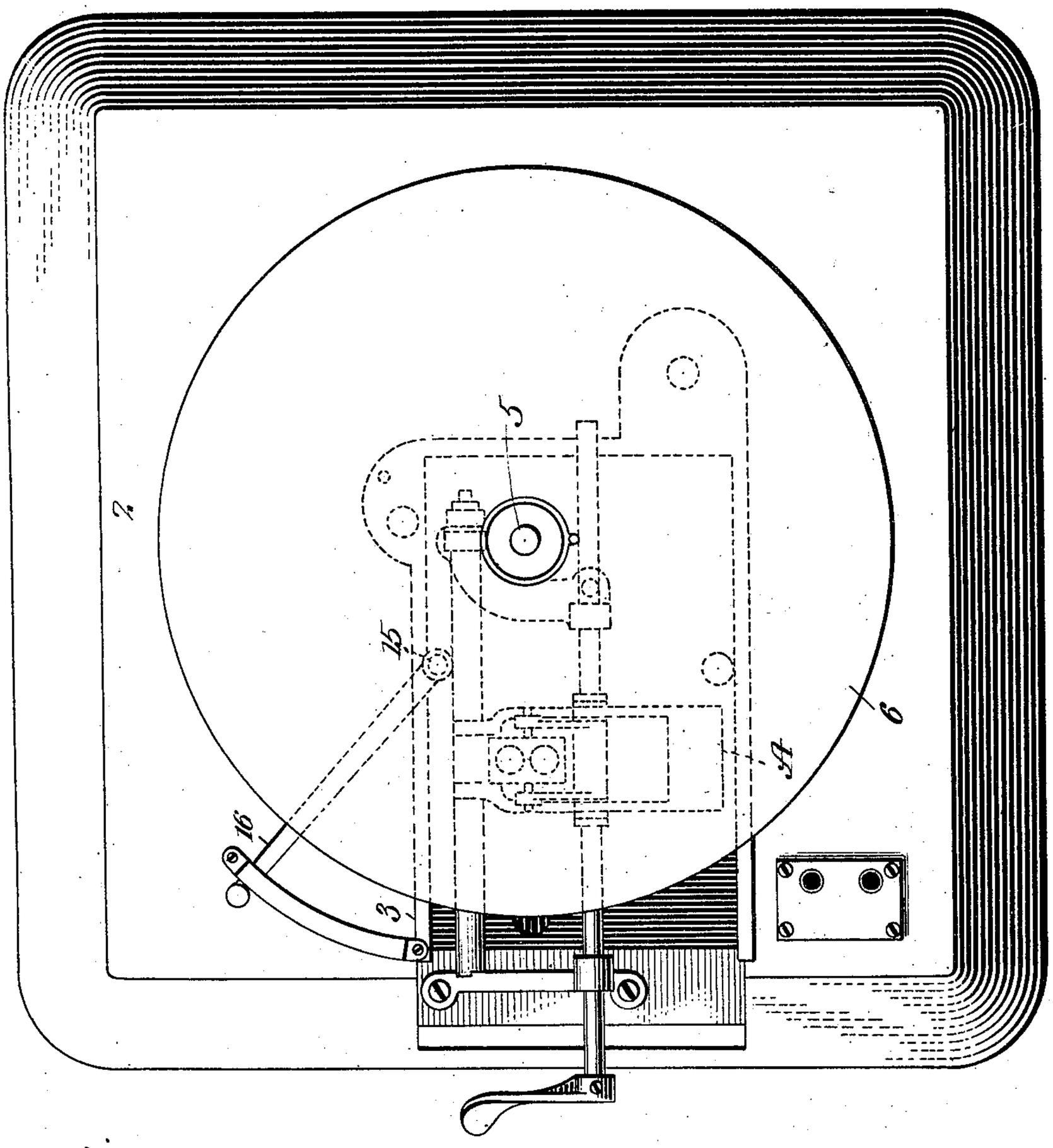


Fig. 1.

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3 SHEETS—SHEET 2.

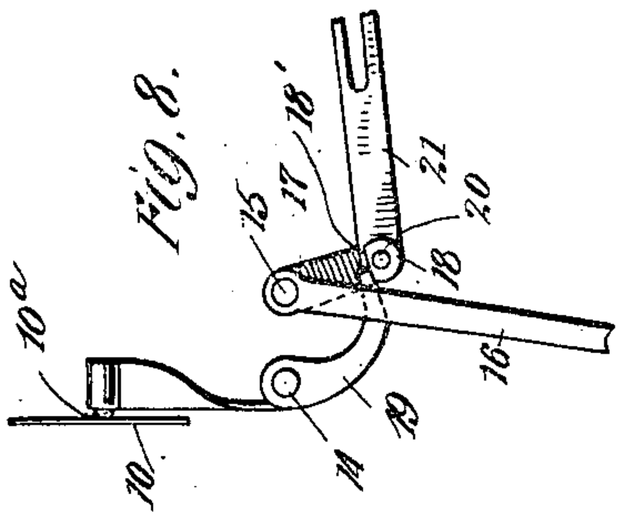


Fig. 8.

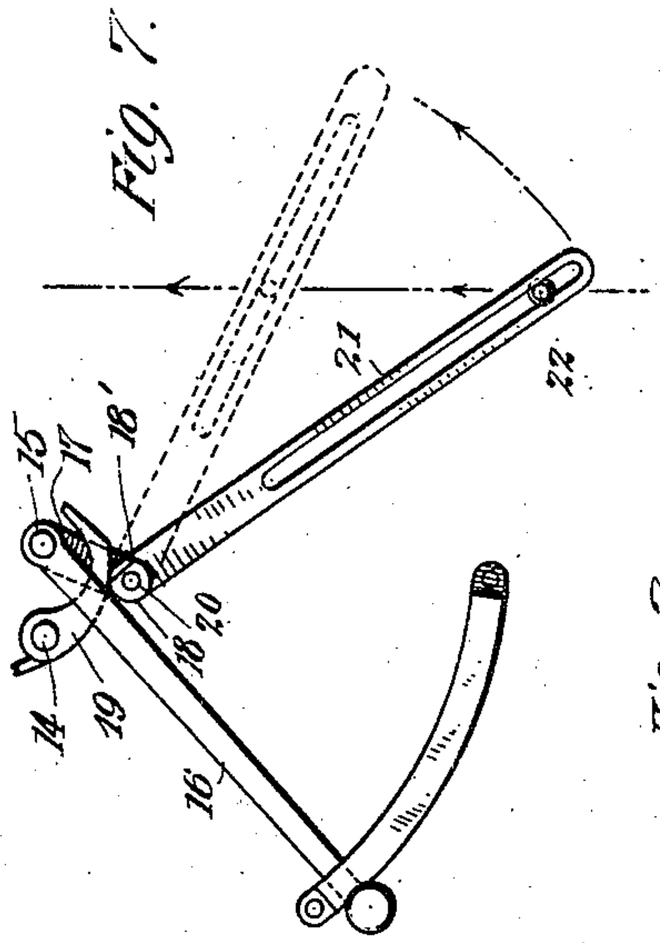


Fig. 7.

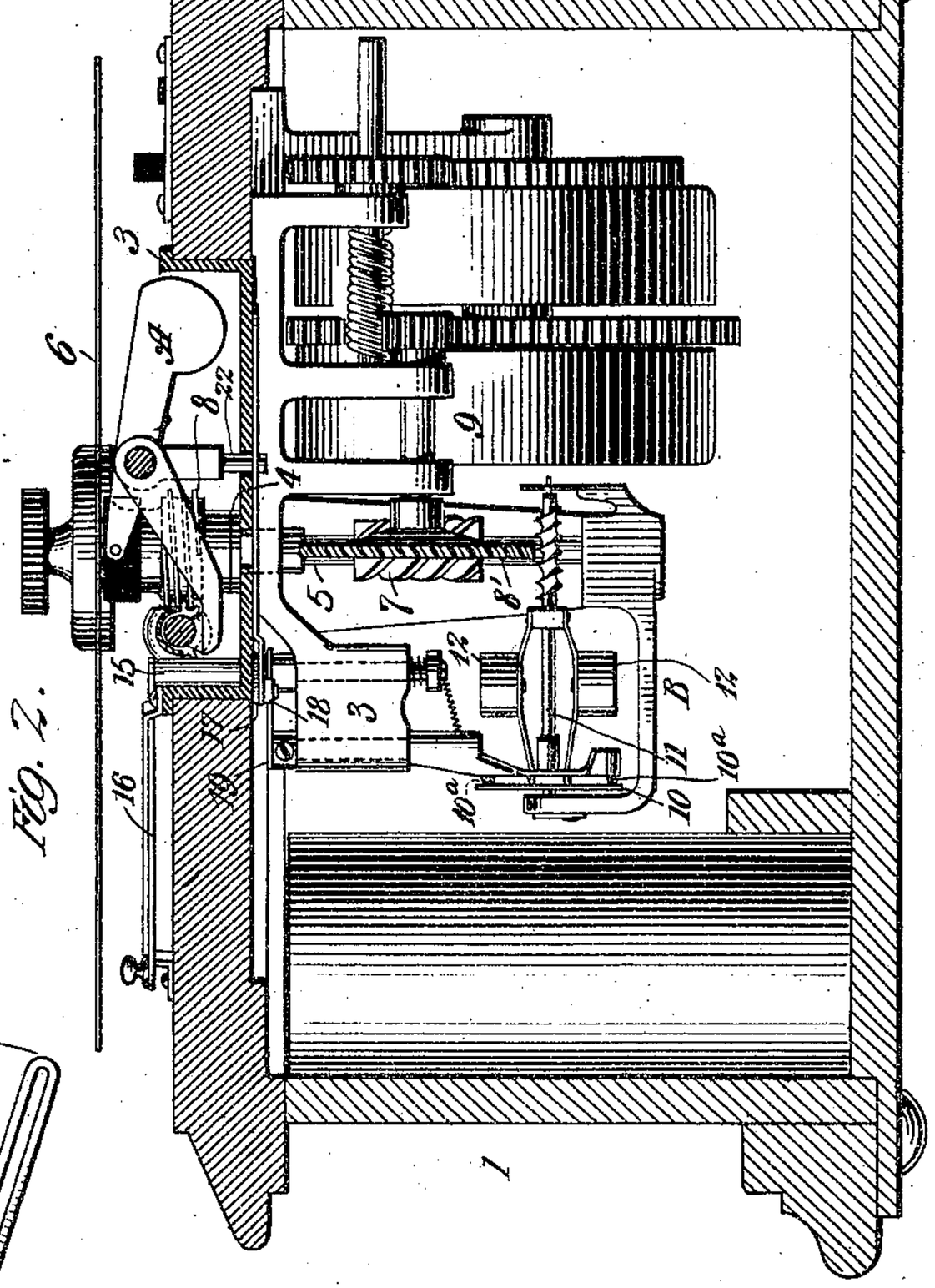


Fig. 2.

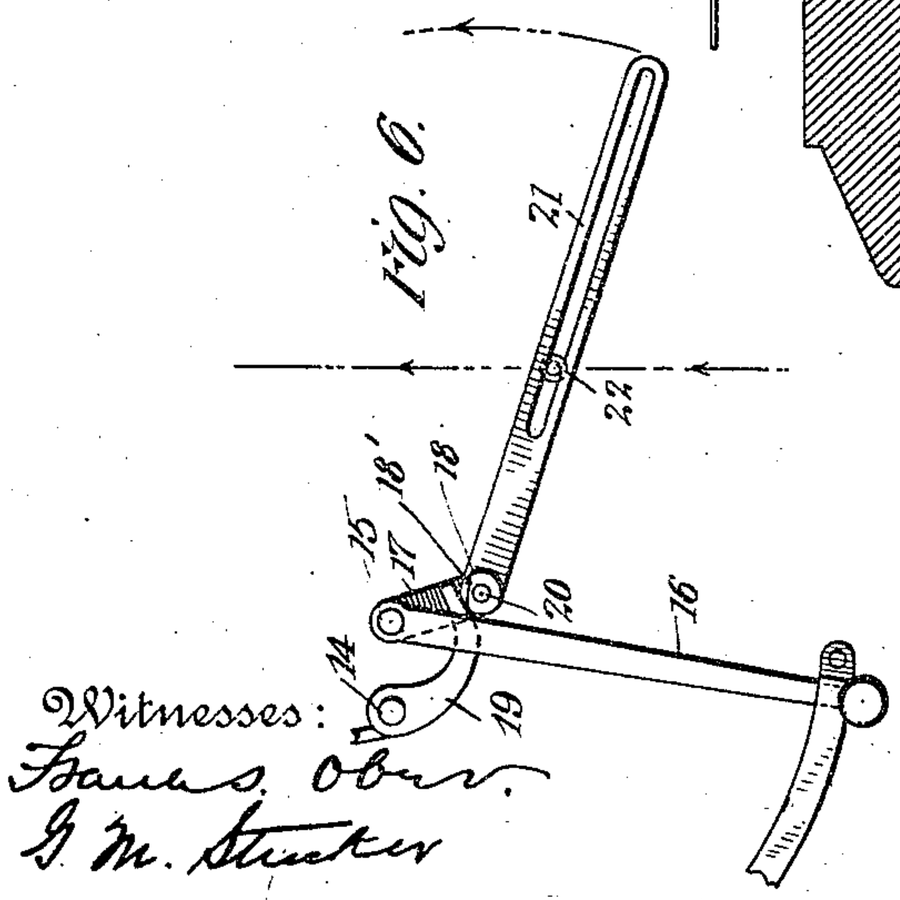


Fig. 6.

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TELEGRAPHONE.

APPLICATION FILED OCT. 10, 1907.

3 SHEETS—SHEET 3.

Fig. 3.

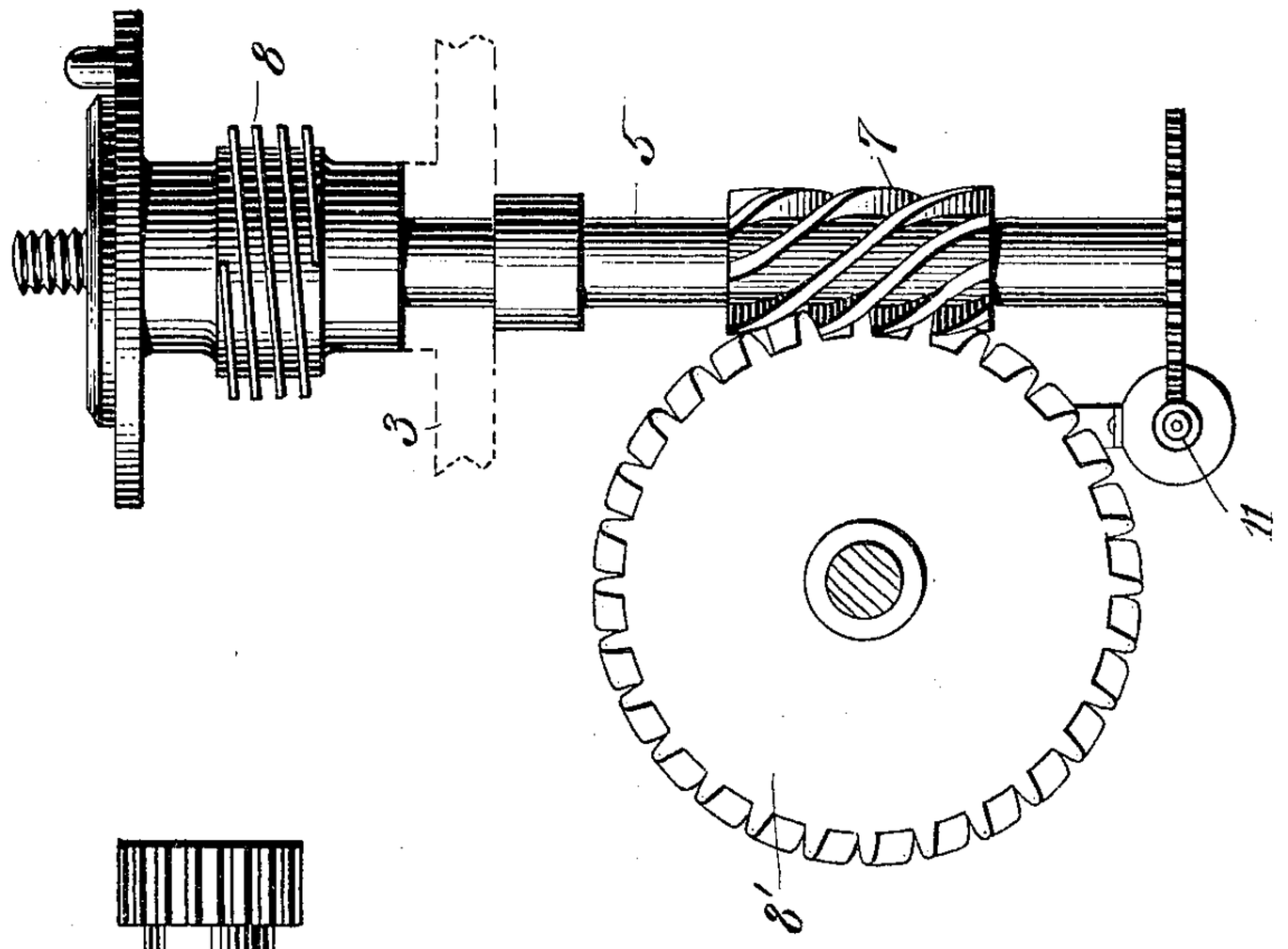



Fig. 4.

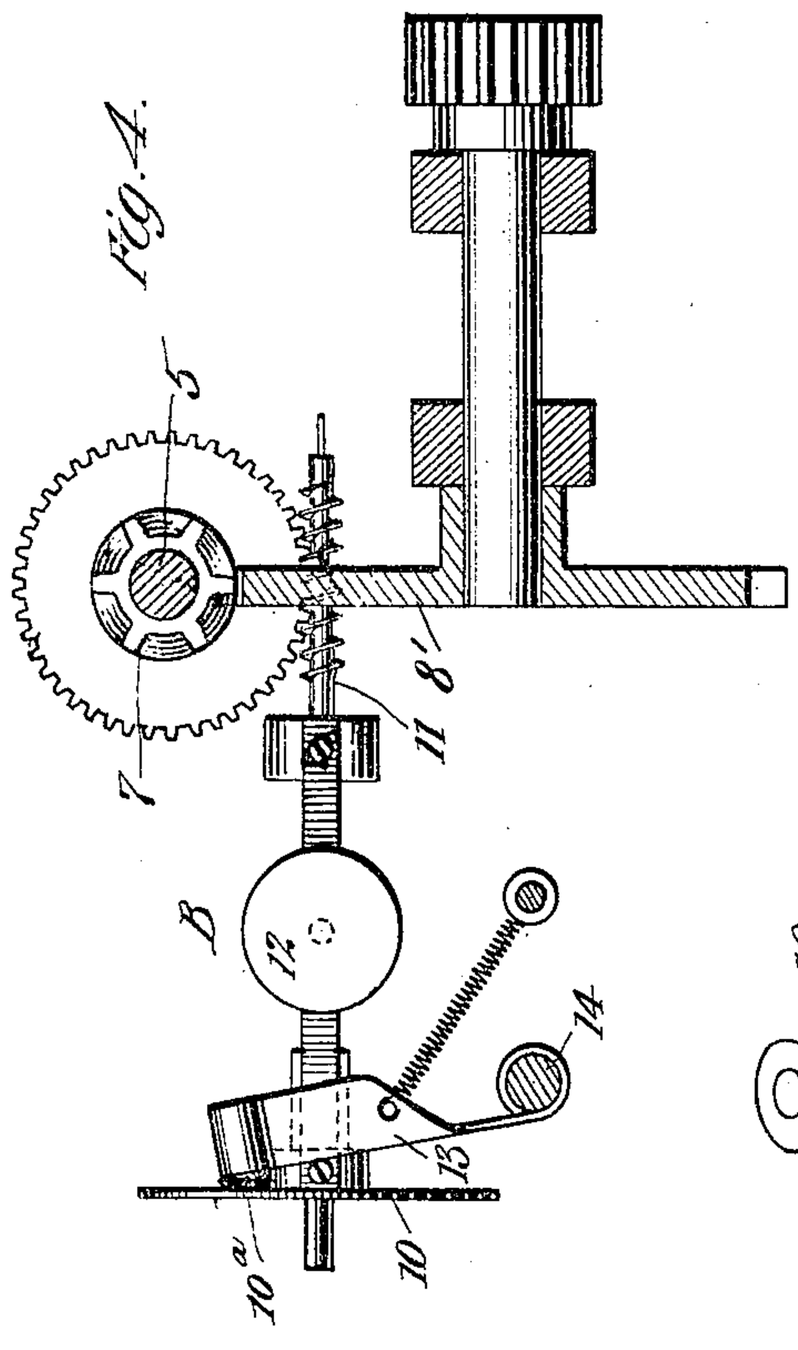
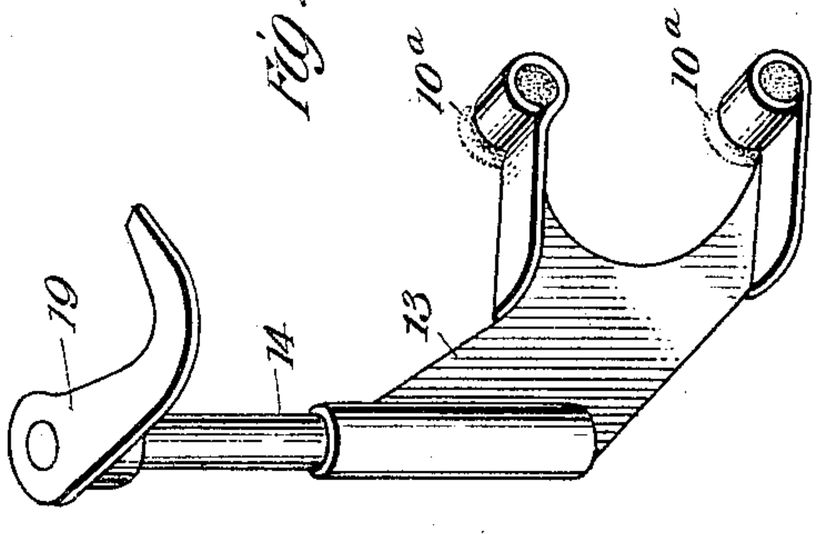



Fig. 5.

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# UNITED STATES PATENT OFFICE.

HERMANN SCHÜTTE, OF WHEELING, WEST VIRGINIA.

## TELEGRAPHONE.

No. 896,416. Specification of Letters Patent. Patented Aug. 18, 1908.

Application filed October 10, 1907. Serial No. 396,845.

*To all whom it may concern:*

Be it known that I, HERMANN SCHÜTTE, a subject of the Emperor of Germany, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Telegraphones, of which the following is a full, clear, and exact description.

My invention relates to an instrument for magnetically recording and reproducing sound, and known as the telegraphone.

More particularly the invention relates to what is known as a "disk machine" in which a flat steel disk is continuoulsy rotated in close proximity or contact with a recording and reproducing magnet which moves radially with respect to the disk and traces a spiral magnetic path or record thereon. With machines of this character, it is evident that the actual lineal speed of the material of the disk with respect to the recording magnet varies as the radial position of said magnet on the disk is changed. In other words, the relative movement is slower when the recording magnet is near the center of the disk than when it is near its circumference, assuming that the speed of the disk is constant. It is desirable to have a constant lineal speed between the steel record and the recording and reproducing magnet, and for this purpose I propose to revolve the disk at a continuously varying speed depending on the radial position of said recording and reproducing magnet. In this way, the changing radial position of said magnet is compensated for, and the speed of travel of the recording material with respect to the magnet is made substantially constant.

With these purposes and objects in view, the invention consists in the features of construction and combination hereinafter set forth and claimed.

In the drawings: Figure 1 is a top or plan view of a telegraphone embodying the principles of my invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a detail view showing the parts for supporting and driving the disk. Fig. 4 is a detail sectional view showing certain features of the mechanism by which the speed of the disk is controlled. Fig. 5 is a perspective view showing a part of the same. Figs. 6, 7 and 8 are detail views of a part of the mechanism showing the same in different positions of operation.

Referring to the drawings in which like parts are designated by the same reference sign, 1 indicates a box or casing having a cover plate 2 which forms the base or support of all the operating parts.

3 denotes a rigid frame or casting inset in the cover 2 and having a bearing 4 in which is journaled a vertical spindle 5.

6 indicates the record disk which is removably secured to the spindle 5, and having worms 7 and 8 thereon. The worm 7 is in mesh with the gear 8′ forming part of a spring motor 9 of any ordinary or approved construction. The worm 8 acts in conjunction with certain mechanism to feed the carriage broadly indicated at A, which carries the recording and reproducing and the erasing magnets. This latter mechanism forms the subject of my companion application Serial No. 394,292 filed herewith, and need not therefore be further considered in this case.

The speed of the motor 9 is controlled by a governor B of any desired character. If a spring motor is used, a convenient form of governor is that shown having a small disk or wheel 10 which moves longitudinally on a shaft 11 under the influence of the weights 12. The shaft 11 is geared to the motor so as to rotate therewith, so that the disk or wheel 10 moves to the right in Fig. 2 as the speed of the motor increases.

10ª indicate relatively fixed stops or pads in the path of such movement of the wheel or disk 10, so that in case the speed of the motor accelerates beyond a certain point said disk 10 will engage these pads and the frictional contact will tend to slow down the motor. Conversely, any reduction in the motor speed relieves the frictional contact so that the motor speed is kept at a predetermined value. This governor in the features thus far described is of the ordinary sort adapted to a spring motor, and in itself constitutes no part of my invention. The invention relates rather to the mechanism acting in conjunction with this governor and by means of which the governor operates differently under different circumstances.

By the present invention, the stops or pads 10ª are not mounted on a fixed part of the machine, but are secured at the ends of an arm 13 which projects rigidly from a shaft 14 journaled in an extension of the frame 3. 15 indicates an additional shaft also journaled vertically in the frame 3 and extending upward therethrough, the upper end being provided with an arm or handle 16. which

swings through an arc to control the angular position of the shaft 15.

17 indicates a small arm projecting from the shaft 15 and having a dog or cam 18. at its extremity. This dog is in the path of movement of a cam arm or extension 19 from the shaft 14. Both the cam arm 19 and the dog 18 are formed in a special way at their engaging faces so as to secure certain effects hereinafter described. The dog 18 is not rigid at the end of the arm 17, but is pivoted thereto at 20. This dog itself has a rigid slotted arm 21 extending therefrom and by means of which its angular position on the arm 17 is controlled. In the drawing, the dog 18 is illustrated in the form of a simple roller with a flat face 21. The particular shape of this part will, however, be varied to suit the requirements. The slotted arm 21 is engaged by a pin 22 which projects rigidly downward from the carriage A, so that the slotted arm is swung through an angle as the carriage feeds backward and forward in its radial movement with respect to the recording disk.

The operation is as follows: Initially the parts are positioned in the relation shown in Fig. 7. The carriage is at the beginning of its movement with the recording and reproducing magnet near the outer edge of the recording disk 6. In this relation the pin 22 is at the outer extremity of the slotted arm 21 about to move in the direction of the arrows in Fig. 7. The handle 16 is shown pressed to the left in this figure, and by reason of which the arm 17 and the dog 18 are correspondingly forced around to engage the cam arm 19. This cam arm having a spiral or volute face, causes the shaft 14 to be turned and the pads $10^a$ to be pressed tightly against the governor disk 10. This engagement is strong enough to stop the motor, so at this time the machine is at rest.

When it is desired to start the machine, the handle 16 is moved to the right in Fig. 7, so that the arm 17 and the dog 18 move outward on the cam arm 19, allowing the pads $10^a$ to yield slightly to the right. (Figs. 2 and 8). This permits the motor to start and the record disk 6 accordingly commences to revolve. The speed of revolution is determined by the governor, and this in turn by the position of the pads $10^a$. The position of the pads $10^a$ depends upon the engagement of the dog 20 with the cam arm 19.

The dog 20 has a compound movement from two entirely separate sources: first, a swinging movement from the arm 16 as already described. This movement causes the starting and stopping of the motor. In addition to this, the dog 20 has a pivotal movement on its own axis 20 under the influence of the slotted arm 21. This movement is controlled by the position of the carriage through the pin 22. By reason of the special shape of the dog 18 having a flattened face 21, the latter has an effect on the cam arm 19 and therefore on the speed of the governor. As the carriage moves inward in the direction of the arrows in Figs. 6 and 7, the flattened face 21 of the dog is more and more exposed to the cam arm 19, so that the pads 12 yield further inward and the governor permits a higher speed of the motor 9. Accordingly, the motor increases its speed gradually as the carriage moves inward, corresponding to the radial inward movement of the recording and reproducing magnet on the recording disk. In this way, the decreasing diameter of the record path is compensated for by an increasing speed of rotation of the disk. At any time it is possible to start and stop the motor by swinging the handle 16 to the left which is always effective to cam inward the arm 19, whatever the angular position of the dog 18 in its pivotal movement. At the limit of inward movement of the carriage, the flat face 21 of the dog directly engages the tip of the cam arm 19 as shown in Fig. 8. This corresponds to the highest speed of the motor as is required.

What I claim, is:

1. In a telegraphone, a continuously rotating steel disk, a magnet movable over the face thereof, means for rotating said disk, a governor acting on said means, a single part movable to vary the controlling action of said governor, and two separate devices both acting on said single part to control its movement, one of said devices being movable to compensate for the radial position of said magnet, whereby the lineal speed of said disk past said magnet is constant, and the other of said devices being adjustable to vary said lineal speed value.

2. A means for obtaining continuously varying motion of a driven element, comprising a governor for controlling the speed of movement of said element, a part acting on said governor for varying the controlling action thereof, and two separate devices both acting on said single part to vary its controlling action, one of said devices having its position continually changed as said element moves, and the other device being adjustable to different positions, whereby the speed of said element at any point of the range of its movement is varied.

3. A means for obtaining continuously varying motion of a driven part, comprising a governor, means acting on the governor to vary the speed of its operation, a cam arm connected to said means, and a pivoted dog having a compound movement from two separate sources and acting on said cam arm.

4. A means for obtaining continuously varying motion of a driven part, comprising a governor, means acting on the governor to vary the speed of its operation, a cam arm connected to said means, and a pivoted dog

connected to be oscillated by the movement of said part to engage said cam arm, and additional means for swinging said dog into varying engagement with said cam arm.

5. A means for obtaining continuously varying motion on a driven part, comprising a governor, means acting on the governor to vary the speed of its operation, a cam arm connected to said means, a pivoted dog engaging said cam arm and having an arm extending therefrom, means extending from said part and engaging said last named arm, and separate means for moving said dog into varying engagement with said cam arm.

6. In a telegraphone, a continuously rotating steel disk, a magnet movable thereover, means for continuously driving said disk, a governor for controlling said means, means acting on the governor to vary the speed of its operation, a cam arm connected to said means, and a pivoted dog having a compound movement from two separate sources and acting on said cam arm.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

HERMANN SCHÜTTE.

Witnesses:
WM. D. COOKE,
LOUIS WALTERS.