

(No Model.)

2 Sheets—Sheet 1.

E. SCHWEINEFLEISCH.  
APPARATUS FOR GRINDING CARD TEETH.

No. 598,015.

Patented Jan. 25, 1898.

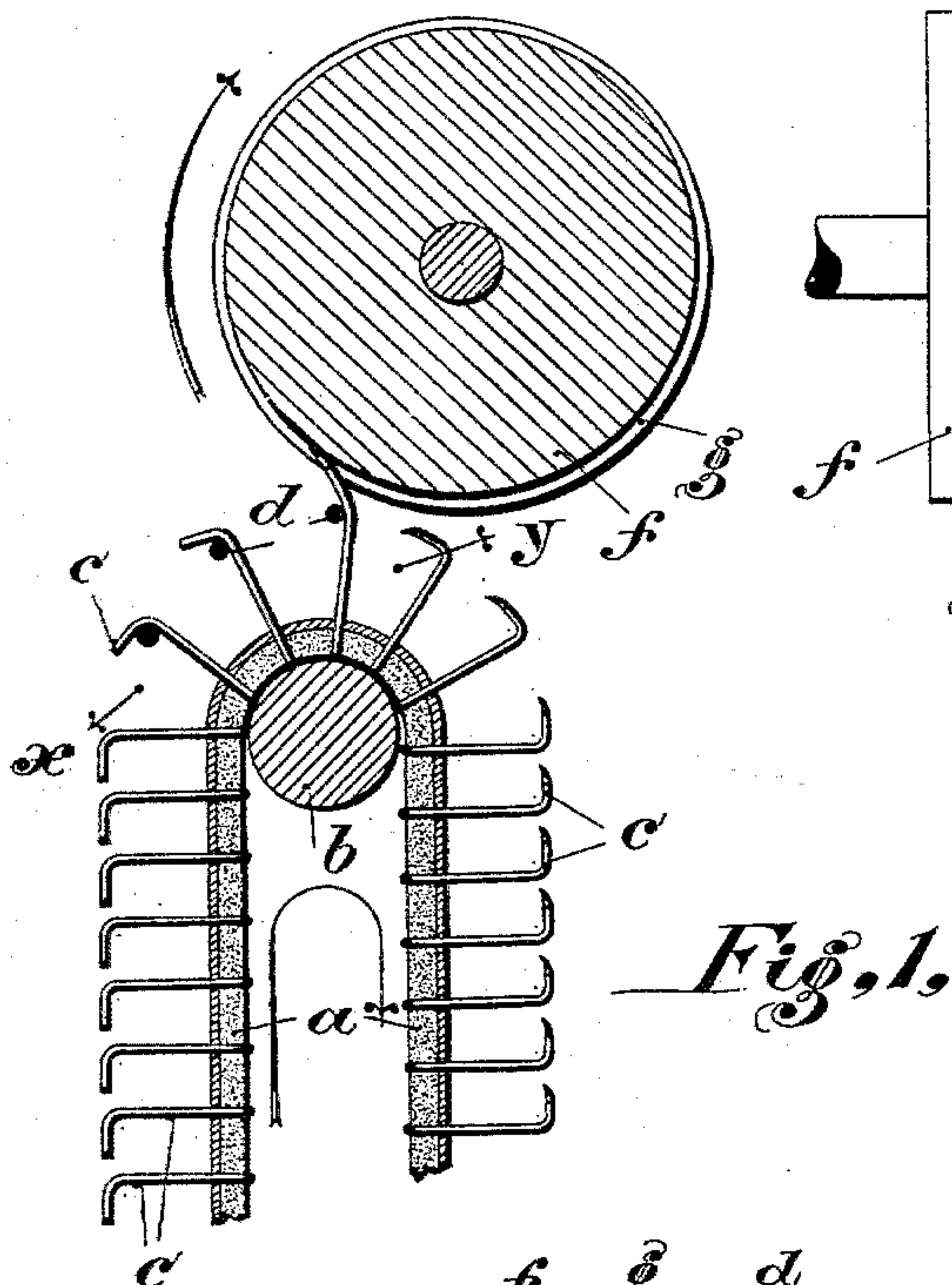


Fig. 1,

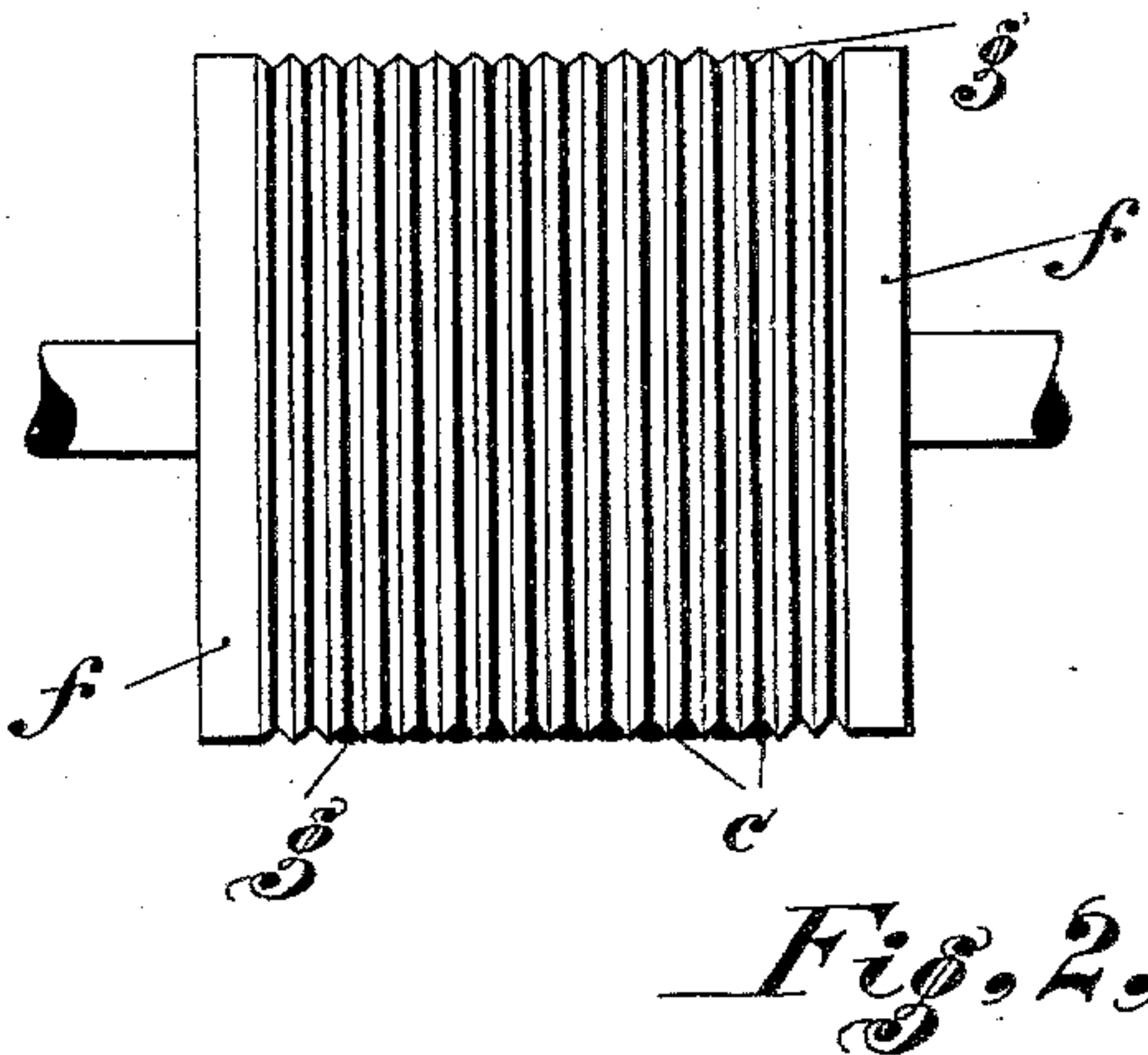
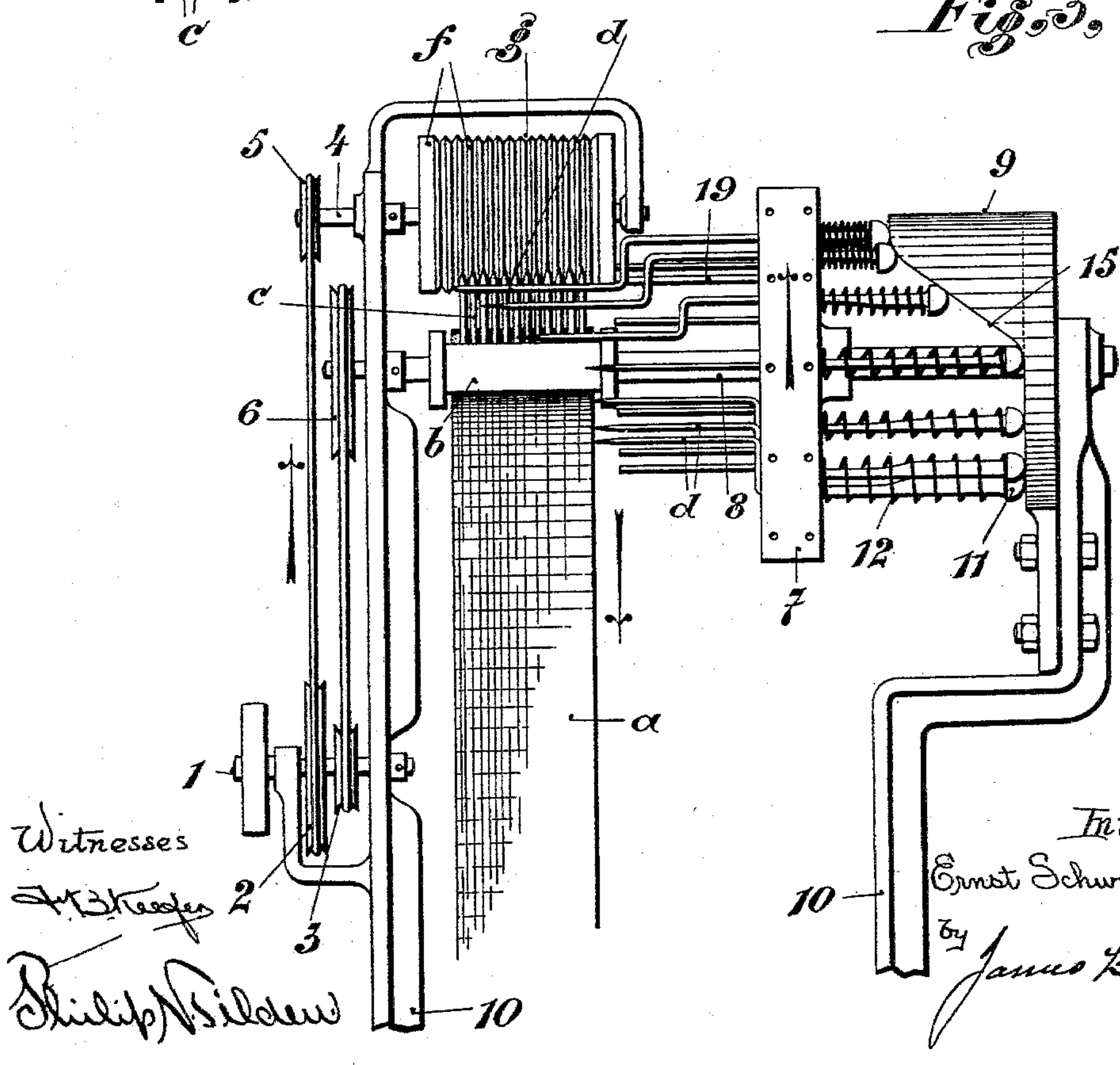


Fig. 2,

Fig. 3,



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Fig. 4.

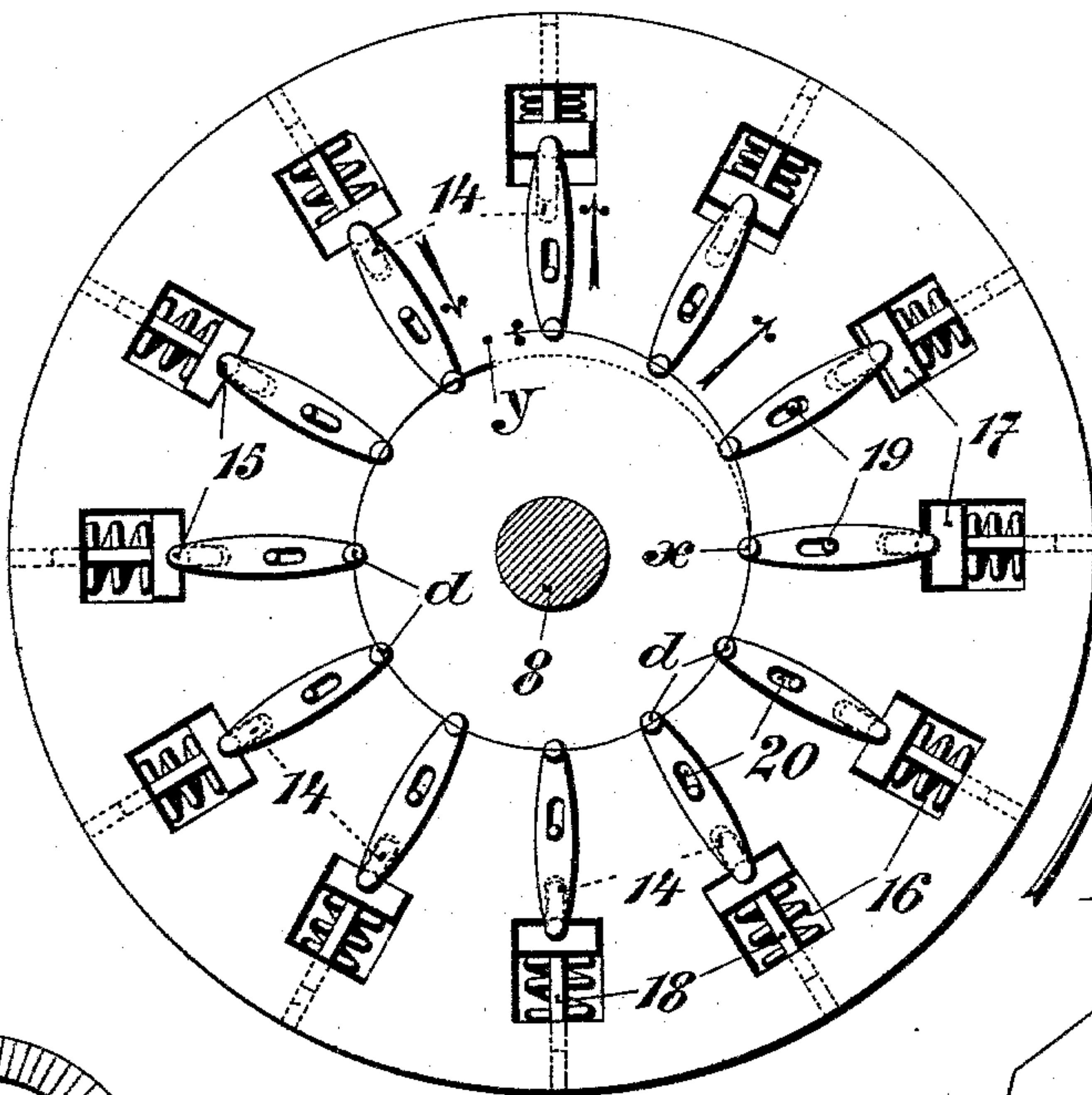


Fig. 6.

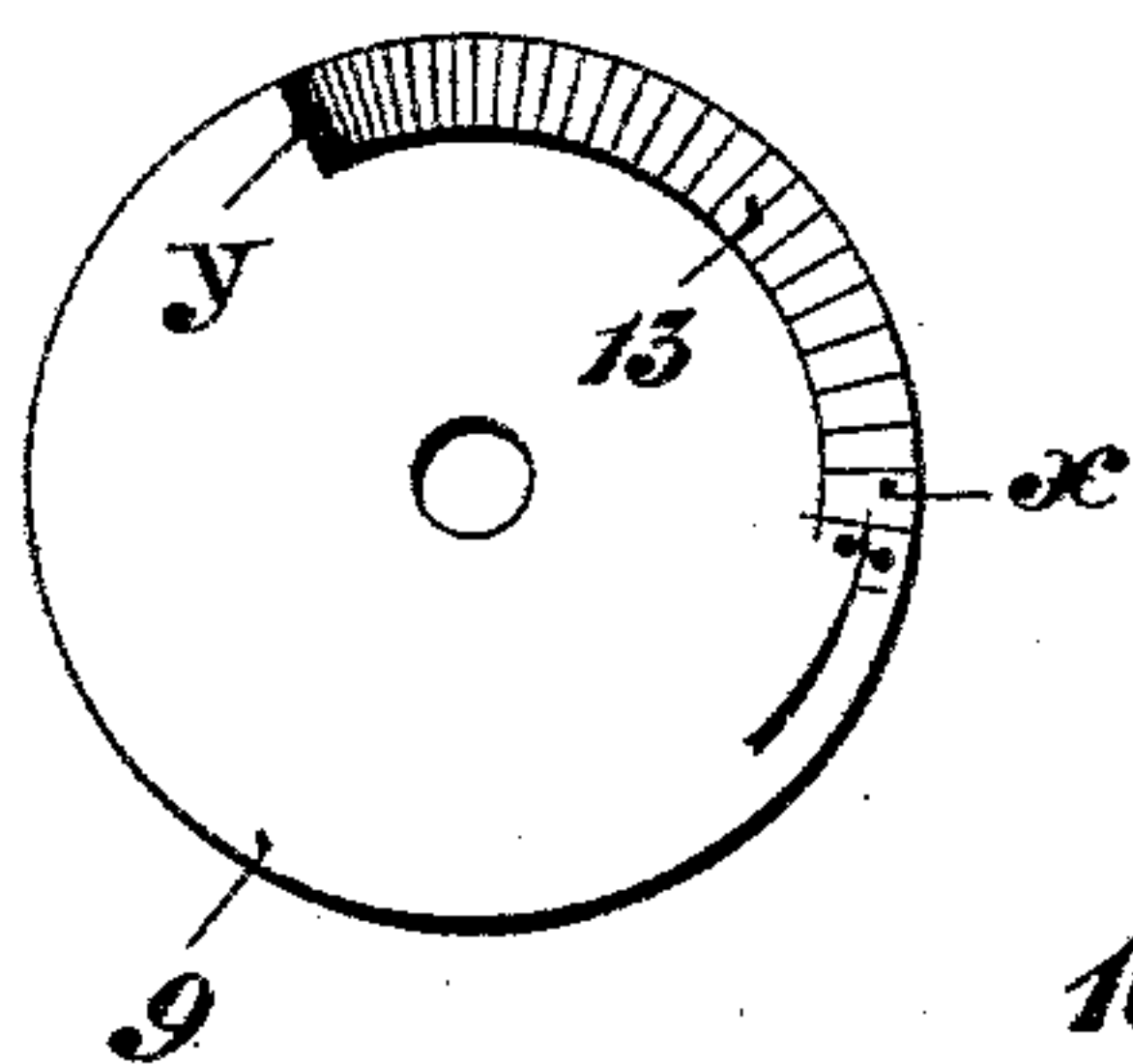


Fig. 5.

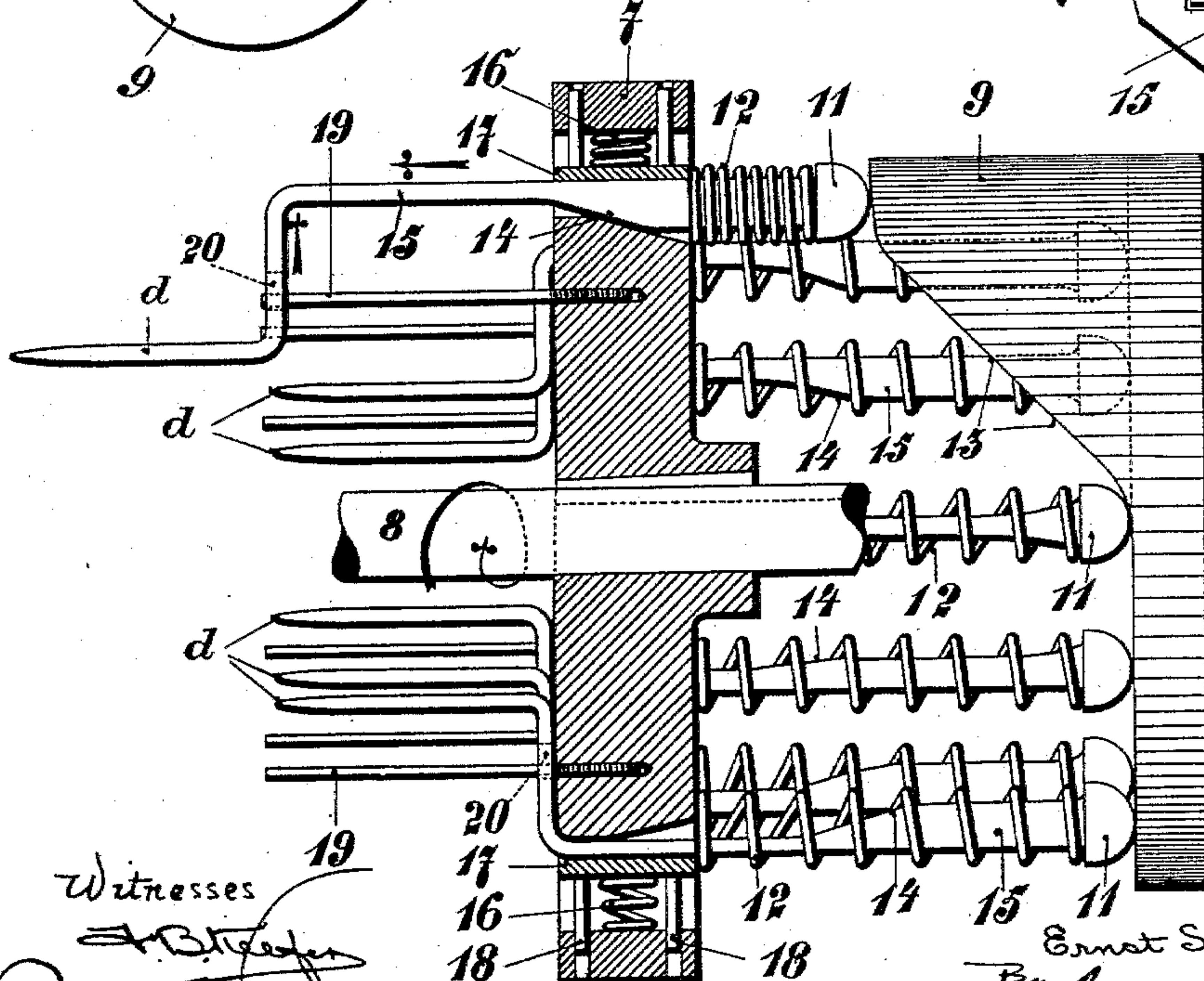
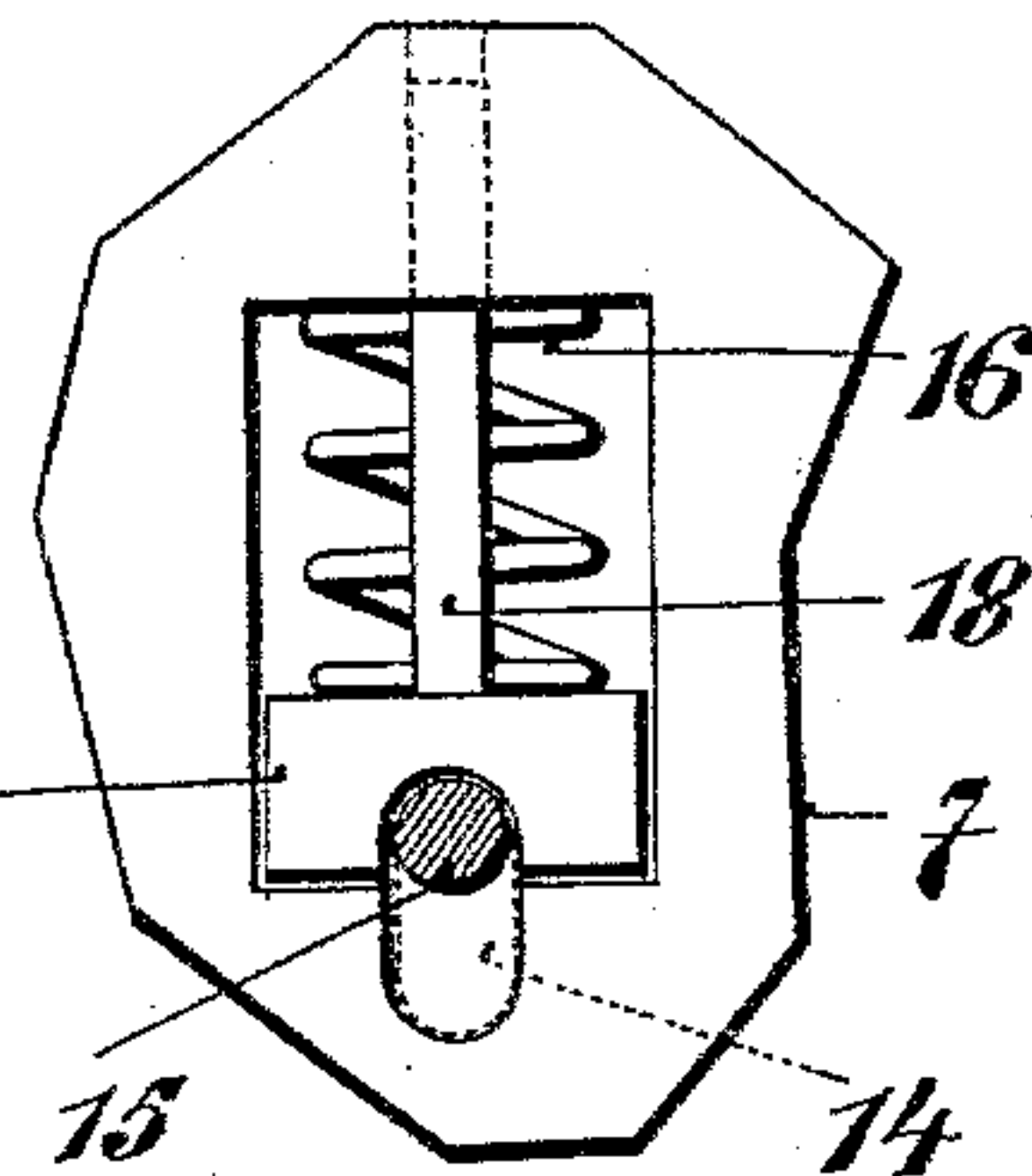


Fig. 7.



Witnesses

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Inventor

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# UNITED STATES PATENT OFFICE.

ERNST SCHWEINEFLEISCH, OF MÜHLHAUSEN, GERMANY.

## APPARATUS FOR GRINDING CARD-TEETH.

SPECIFICATION forming part of Letters Patent No. 598,015, dated January 25, 1898.

Application filed May 28, 1897. Serial No. 638,586. (No model.)

*To all whom it may concern:*

Be it known that I, ERNST SCHWEINEFLEISCH, a subject of the Emperor of Germany, residing at Mühlhausen, in the Empire of Germany, have invented certain new and useful Improvements in or Relating to Apparatus for Grinding Card-Teeth, of which the following is a specification.

The present invention relates to apparatus for grinding card-teeth; and it consists in the combination of devices hereinafter described and claimed.

Figure 1 shows in cross-section the grinding-disk and a feed-roller with card-clothing thereon. Fig. 2 shows the grooved grinding-disk in side elevation. Fig. 3 is an elevation of the grinding-machine. Fig. 4 is a face view of a disk carrying a series of movable pins for applying the card-teeth to the grinding-disk. Fig. 5 is a view of the pin-carrying disk and a cam-guide for the pins. Fig. 6 is a face view of the cam. Fig. 7 is a detail view of a portion of the pin-carrying disk.

The machine comprises a feed-roller *b*, over which is guided the card-clothing *a*, which may be formed, for instance, as an endless band. The teeth *c* of this card-clothing are applied successively in transverse series or rows against an emery or like disk *f*, provided with grooves *g* and supported slightly behind or to one side of the roller *b*, rotating in the same direction, but at a much higher speed. The teeth are applied to this disk *f* by means of pins *d*, which rotate at the same speed as the teeth *c* and are horizontally adjustable on a disk 7 and at the same time are capable of being raised radially. The teeth will then be ground at their free ends to the shape of an arrow or bevel-edged point, their extreme points being slightly bent inward, Figs. 1 and 2. During the rotary movement of the pins *d* the rectilinear horizontal movement of said pins takes place in such manner that the advance movement is gradual and the return movement very sudden, and at the same time the pins are radially raised in places where the teeth *c* are to be applied against the grinding-disk *f*, Fig. 1, from *x* to *y*. After the raised teeth have passed the grinding-disk—that is to say, after they have been ground—the pins *d* suddenly return into a position in which they do not effect or engage with the teeth *c* at

*y*, Fig. 1, and travel around until they reach again their operative position at *x*, when they are caused to penetrate into another transverse series of teeth and to rise as before.

The grinding-disk *f* as well as the feed-roller *b* are driven from the driving-shaft of the apparatus. On this driving-shaft 1 may be arranged, for instance, a large driving-pulley 2 and a considerably smaller pulley 3. The large pulley 2 is connected with a much smaller one, 5, on the shaft 4 of the grinding-disk *f*, so that the latter is rotated at a great speed. The feed-roller *b*, for which only a small number of revolutions is required, is driven by a large pulley 6, connected to a much smaller pulley 3 on the driving-shaft 1. The pins *d* are arranged in a circle on a disk 7, secured on the continuation 8 of the spindle of the feed-roller *b*. This disk 7, with the pins *d*, is shown in Fig. 4 in front elevation, and in Fig. 5 in longitudinal section on a slightly-enlarged scale.

9 is a cam mounted in the frame 10 of the machine, said cam being concentric with the feed-roller *b* and at the same time forming a bearing for the continuation 8 of the spindle of the feed-roller, the cam being shown in Fig. 6 in front elevation.

In consequence of the disk 7, carrying the pins *d*, being arranged on the continuation 8 of the spindle of the feed-roller *b* said disk rotates with the same speed as the latter.

The horizontal reciprocating movement of the pins *d* with a gradual advance and sudden withdrawal is effected by the free heads, preferably ball-shaped, of said pins sliding over the cam 9 and by helical springs 12 being placed between the heads 11 of the pins *d* and the disk 7, said springs acting on the pins *d*. When the disk 7 is turned in the direction indicated by the arrow, the pins *d*, having arrived at *x*, Figs. 1, 4, and 6, will be gradually pushed forward between the transverse series of the card-teeth, Figs. 1 and 3, till they are fully extended, owing to their heads 11 rising on the cam-surface 13 of the cam 9. At the same time the pins *d* are raised radially and press the teeth to be ground against the disk *f* by means of the inclined surfaces 14 of the rear part 15 of the pins. The inclined surfaces 14 are arranged on corresponding surfaces of holes in the disk



7 and are constantly pressed toward the middle of the disk by springs 16, provided with washers 17, arranged so as to be radially movable. The washers 17 are provided with guide-studs 18, as shown. After the heads 11 of the pins have reached, at the point *y* Fig. 6, the end of the suddenly-falling cam-surface 13 they fall back suddenly, owing to the action of the springs 12, Figs. 3 and 5, and thus the springs 16 also return to their original position and press upon the reduced portion of the bolt 15, Fig. 5. The pins *d* are in this case cranked inward at a right angle in order to enable them to be sufficiently supported in the disk 7, which is made as wide as possible, as, owing to the small size of the card-teeth, they can be arranged between the series of teeth only in a small circle.

The disk 7 may carry guide-studs 19, extended through slots 20 in the cranked portions of the pins *d* to assist in supporting them when pushed outward by the cam.

What I claim as my invention is—

1. In apparatus for grinding card-teeth carried on an endless belt or foundation, the combination with the feed-roller, of a guide-disk revolving with said roller, and spring-controlled pins passing through said disk and

adapted to carry and feed forward the card-teeth, said pins being successively pressed forward and raised as they revolve, by means of a cam-guide, substantially as described. 30

2. In apparatus of the character described for grinding card-teeth, the spring-controlled cranked pins, such as *d*, passing through holes having inclined surfaces in the disk 7, in combination with a stationary cam-guide such as 9, substantially as described. 35

3. In apparatus of the character described, for grinding card-teeth, the combination of the disk such as 7, springs 16 and washer 17 for the purpose of pressing the pins toward the center of the disk, substantially as described. 40

4. In apparatus of the character described for grinding card-teeth, a shaft 8 carrying the card-clothing feed-roller *b*, and disk 7, carrying and guiding a series of pins *d* in combination with a cam-guide 9, substantially as described. 45

In witness whereof I hereby set my hand in the presence of the two subscribing witnesses. 50

ERNST SCHWEINEFLEISCH.

Witnesses:

EMILY O. MILLER,

FAURE MOORE.