

F. E. P. EHRLICH.  
DRIVING GEAR FOR MUSIC SHEETS.

No. 559,773.

Patented May 5, 1896.

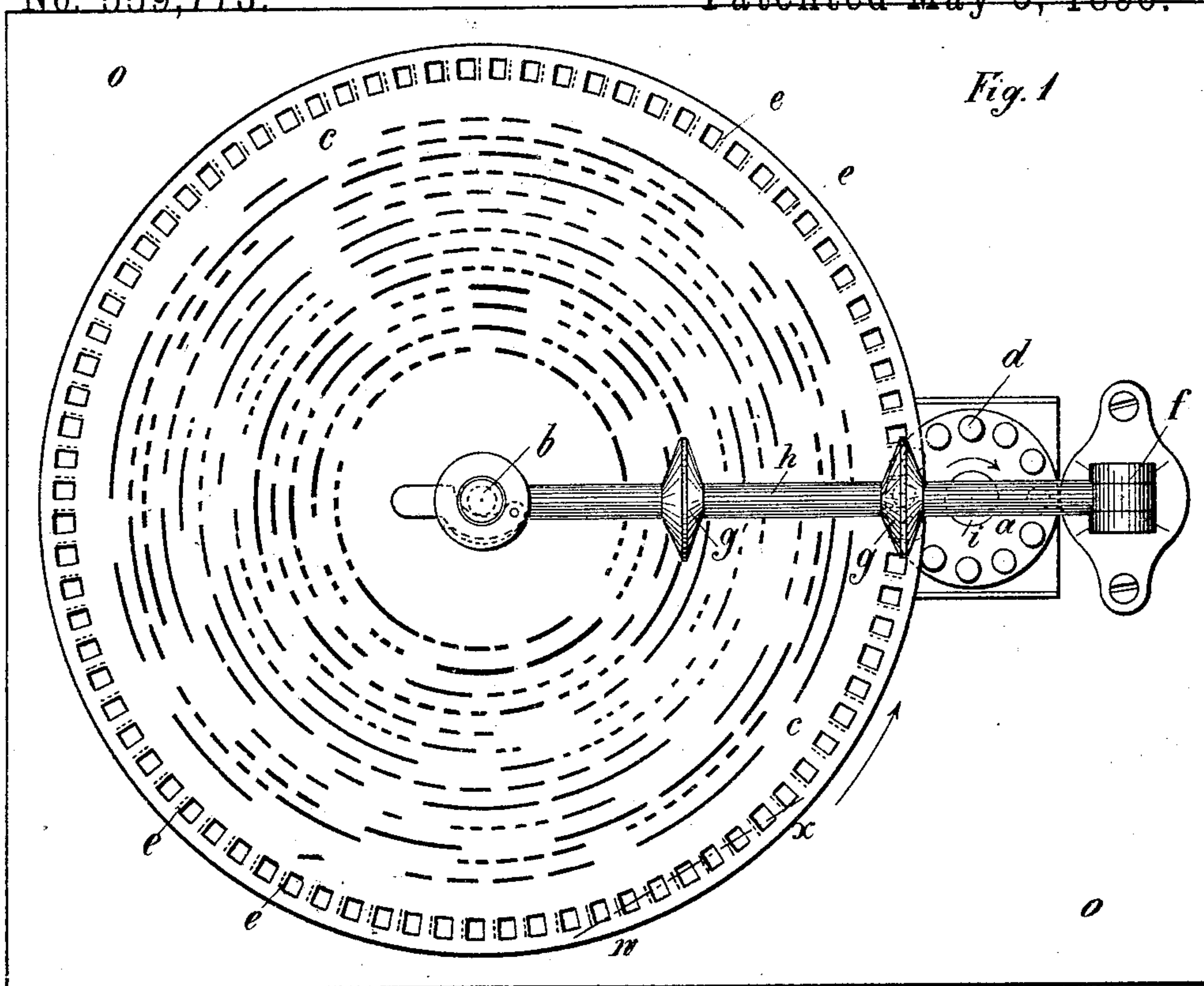


Fig. 2

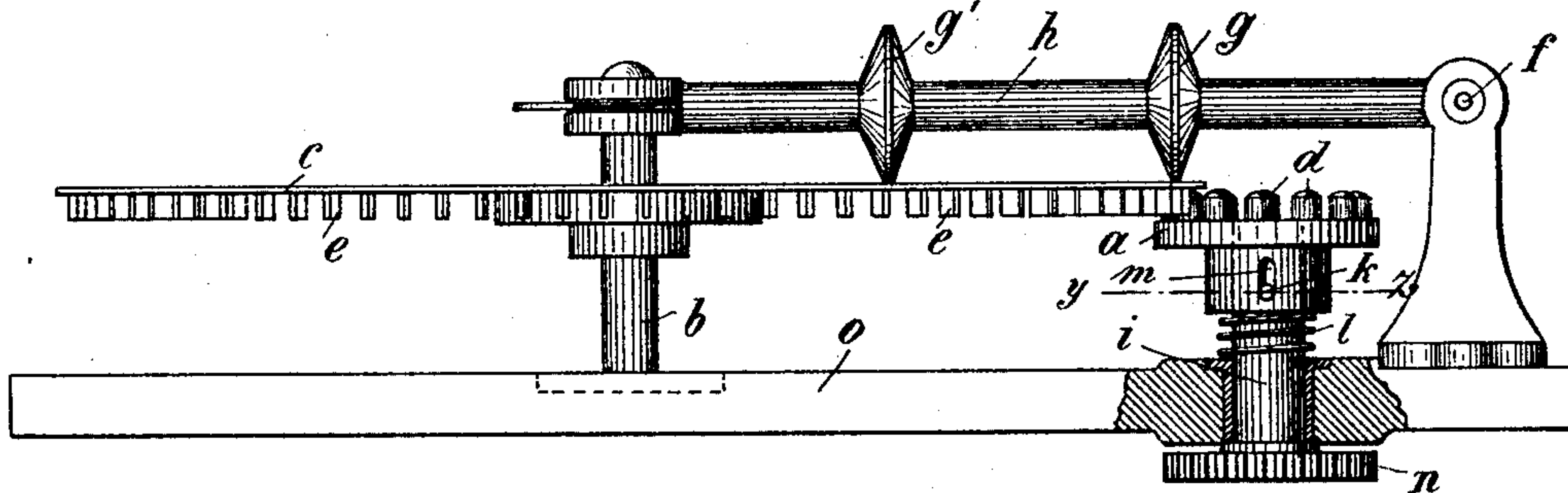
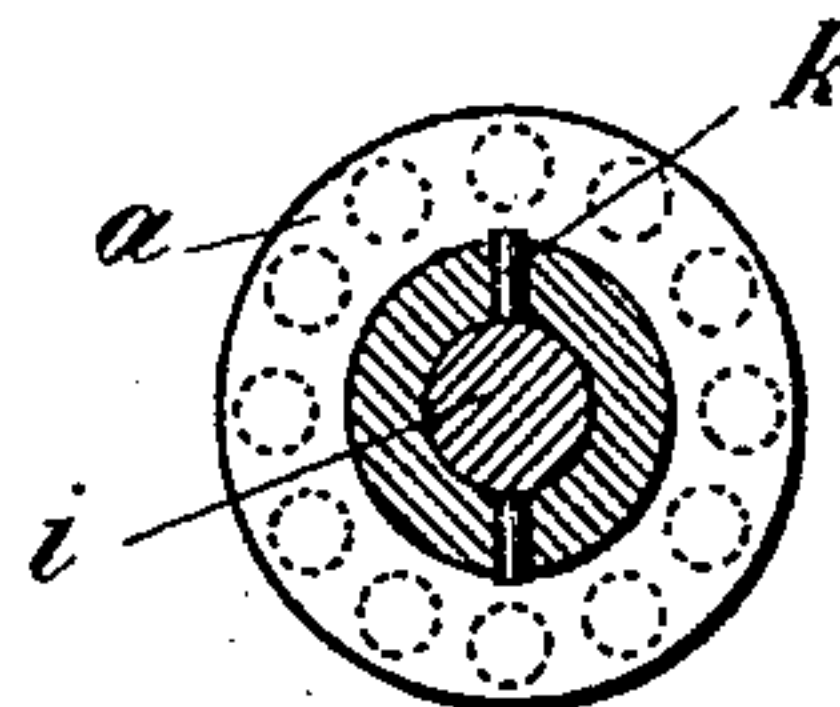


Fig. 3



Inventor

Friedrich Ernst Paul Ehrlich

by *Marcellus Dailer*  
his attorney

Witnesses

*Frederick Steyer*  
*Nathan H. Robbins*

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Fig. 4

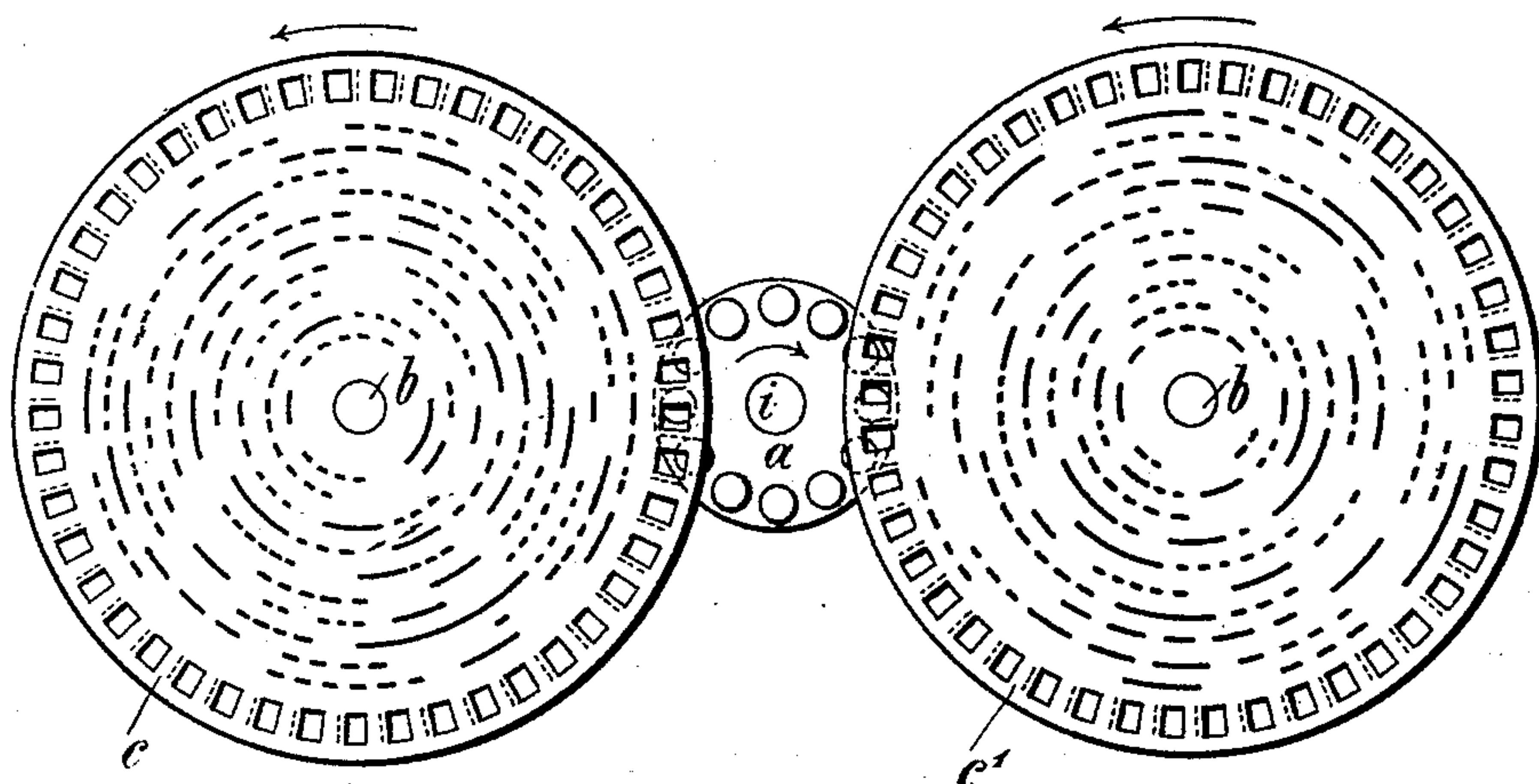


Fig. 5

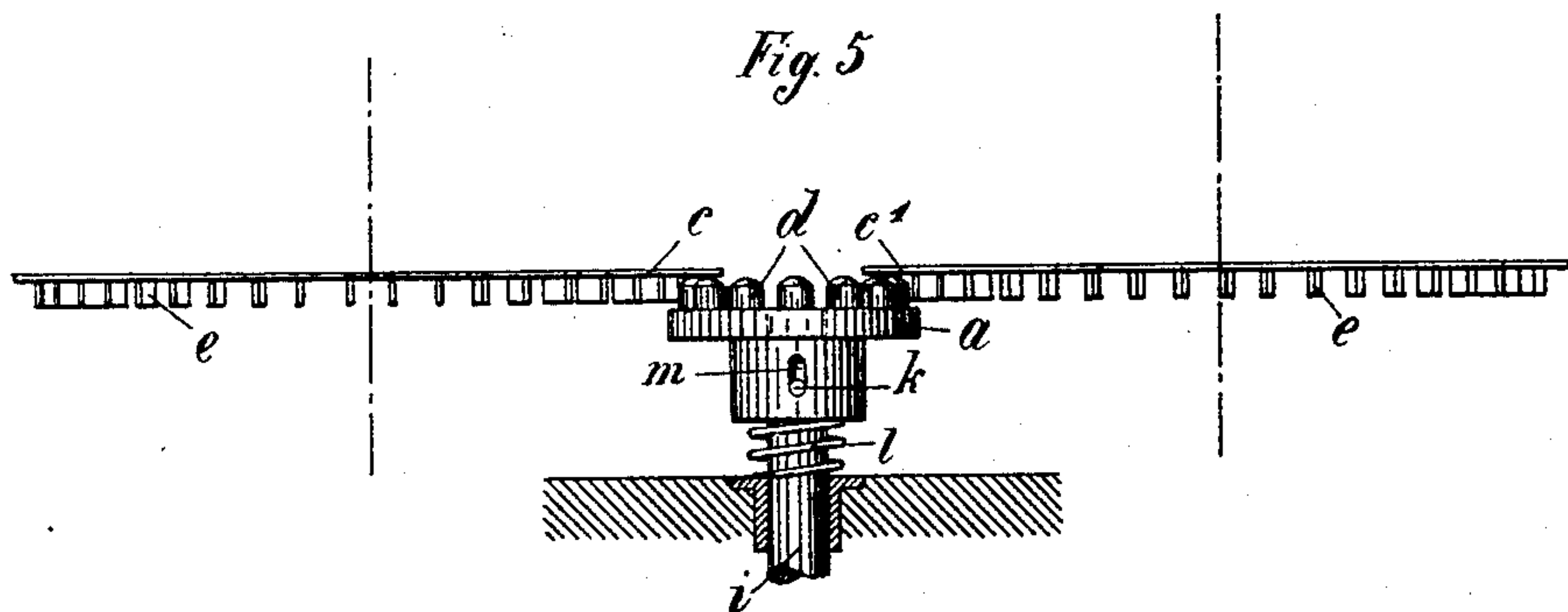


Fig. 6



Fig. 7



Witnesses:

Frederick B. Keefe  
Nathan H. Robbins.

Inventor:

Friedrich Ernst Paul Ehrlich  
by Marshall Bailey  
His attorney.



# UNITED STATES PATENT OFFICE.

FRIEDRICH ERNST PAUL EHRLICH, OF GOHLIS, GERMANY.

## DRIVING-GEAR FOR MUSIC-SHEETS.

SPECIFICATION forming part of Letters Patent No. 559,773, dated May 5, 1896.

Application filed March 14, 1896. Serial No. 583,223. (No model.)

*To all whom it may concern:*

Be it known that I, FRIEDRICH ERNST PAUL EHRLICH, a subject of the King of Saxony, residing at Gohlis, near Leipsic, Kingdom of Saxony, Germany, have invented certain new and useful Improvements in Driving-Gear for Music-Sheets, of which the following is a specification.

This invention relates to driving-gear for music-sheets of mechanical musical instruments, especially those of which the music-sheets consist of sheet metal and are formed as toothed wheels to engage a driving-gear. Heretofore it has been customary to form the teeth upon the periphery of the music-sheet after the fashion of a spur-wheel. The driving-pinion and the music-sheet thus formed being placed edge to edge, with their teeth in engagement; the driving-pinion in operation is apt to bear against the music-sheet, the direction of its pressure being inward and toward the center of the sheet. The result is that the sheet is liable to and frequently does buckle and bend, while at the same time the teeth formed from the thin metal of which the music-sheet is made wear rapidly. Injuries of this kind produce irregular rotation of the music-sheet, and consequently defective playing of the instrument.

The object of my invention is to overcome these defects, and this result I attain by forming the music-sheet and driving-pinion as crown-wheels. The teeth on the music-sheet project downward from the under face of the sheet and are formed in one with the latter. The teeth or cogs on the driving-pinion are upon the upper face of the latter, and the pinion itself is held up in engagement with the sheet by spring or yielding pressure.

In the accompanying drawings, to which I shall now refer for a better understanding of my invention, Figure 1 is a plan of the driving-gear. Fig. 2 is a side elevation of the same with the base partly in section. Fig. 3 is a section on line *yz*, Fig. 2, showing the under face of the driving-pinion. Figs. 4 and 5 show in plan and side elevation, respectively, driving-gear for the simultaneous rotation of two music-sheets by one and the same driving-pinion. Fig. 6 is a section on line *wx*, Fig. 1, showing the manner in which the teeth

on the sheet are formed. Fig. 7 is a like view of a modified form of teeth.

The music-sheet *c*, which is loosely placed on an axle *b*, fixed to the base-plate *o*, is provided in proximity to its edge with downwardly-projecting teeth *e*, formed by punching out and bending down suitable strips of the metal of which the sheet is composed, as clearly shown in Fig. 6. In order to obtain stronger teeth, they may be made each of two strips *e' e''*, punched from opposite sides of a median line and bent down toward each other, as indicated in Fig. 7, the two being united, if need be, by solder or other suitable means. The driving-pinion is also formed as a crown-wheel *a*, the teeth *d* of which are so proportioned as to enter between the teeth of the music-sheet and to engage the same in such a way as to revolve the sheet easily and smoothly. The driving crown-wheel *a* has longitudinal movement on its shaft *i*, the extent of this movement being determined by the length of the slots *m* in the hub of the wheel, which are entered by the cross-pin *k*, fast to the shaft *i*, said pin serving also as a means by which the rotary movement of the shaft is transmitted to the wheel. A coiled spring *l* serves to press the wheel up toward the music-sheet.

To hold the sheet down and resist any upward pressure thereon, I provide rollers *g g'*, mounted to revolve upon a rod or cylindrical arm *h*, which at its outer end is hinged at *f* to a standard fixed to base-plate *o*. At its inner end the arm has a boss which fits upon the upper end of the axle *b* and has a latch which engages the axle, so as to hold the arm firmly down. In the position shown in the drawings the arm overhangs the music-sheet and the rollers bear upon the latter, one of the rollers being directly above the point where the teeth of the music-sheet and driving-wheel engage each other. The hinged arm *h* can of course be turned back on its hinge whenever it is desired to remove or replace a music-sheet. Shaft *i*, through its pin-gear *n*, is driven by any known or suitable means, such as spur or worm gearing driven by hand or clockwork or other prime mover. An advantage of my improved driving-gear is that if, in putting in a music-sheet, the teeth



of the latter should strike on top of the teeth of the driving-wheel, instead of entering between the latter, the wheel *a* will be depressed, its spring *l* yielding for this purpose; but as soon as the wheel *a* is rotated its teeth will come opposite the intervals between the teeth on the music-sheet, and then the spring *l*, now free to act, will at once throw up the wheel into engagement with the music-sheet.

Manifestly under my arrangement there is no pressure upon the outer edge of the sheet toward the center, so that all danger of bulging is avoided, and the arrangement of parts is such as to minimize the wear and tear of the teeth on the music-sheet.

My improved driving-gear, as illustrated in Figs. 4 and 5, can with advantage be employed for the purpose of imparting motion from one and the same crown-wheel *a* simultaneously to two music-sheets *c c'*, arranged for two musical instruments placed side by side. Two instruments playing in accord produce a far better effect than a single instrument of correspondingly larger size; but all driving-gears or devices for music-sheets hitherto used, so far as I am informed, do not afford that precise uniformity and correspondence in the movement of the two sheets that is indispensable to perfect accord in the tune, aside from which other means heretofore proposed for simultaneously rotating two music-sheets in one and the same direction do not possess the simplicity and certainty of perfect operation by which my improved driving-gear is characterized.

Having described my improvements, what I claim herein as new and of my own invention is as follows:

1. In driving-gear for music-sheets of mechanical musical instruments, a music-sheet formed as a crown-wheel with downwardly-projecting teeth, in combination with a driving crown-wheel engaging said music-sheet, and movable toward and away from the same, and a spring by which said wheel is pressed toward said music-sheet.

2. In driving-gear for music-sheets of mechanical musical instruments, a music-sheet formed as a crown-wheel with downwardly-projecting teeth, in combination with a driving crown-wheel engaging said music-sheet and movable to and from the same, a spring by which said wheel is pressed up toward the music-sheet, and rollers supported in a suitable frame and arranged to bear from above upon the music-sheet, substantially as and for the purposes hereinbefore set forth.

3. In combination with the driving crown-wheel of the two music-sheets *c c'*, formed as crown-wheels with downwardly-projecting teeth engaging the driving crown-wheel, under the arrangement and for joint operation, as hereinbefore set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FRIEDRICH ERNST PAUL EHRLICH.

Witnesses:

ERWIN RAABE,

OTTO DOEDERLEIN.