

(No Model.)

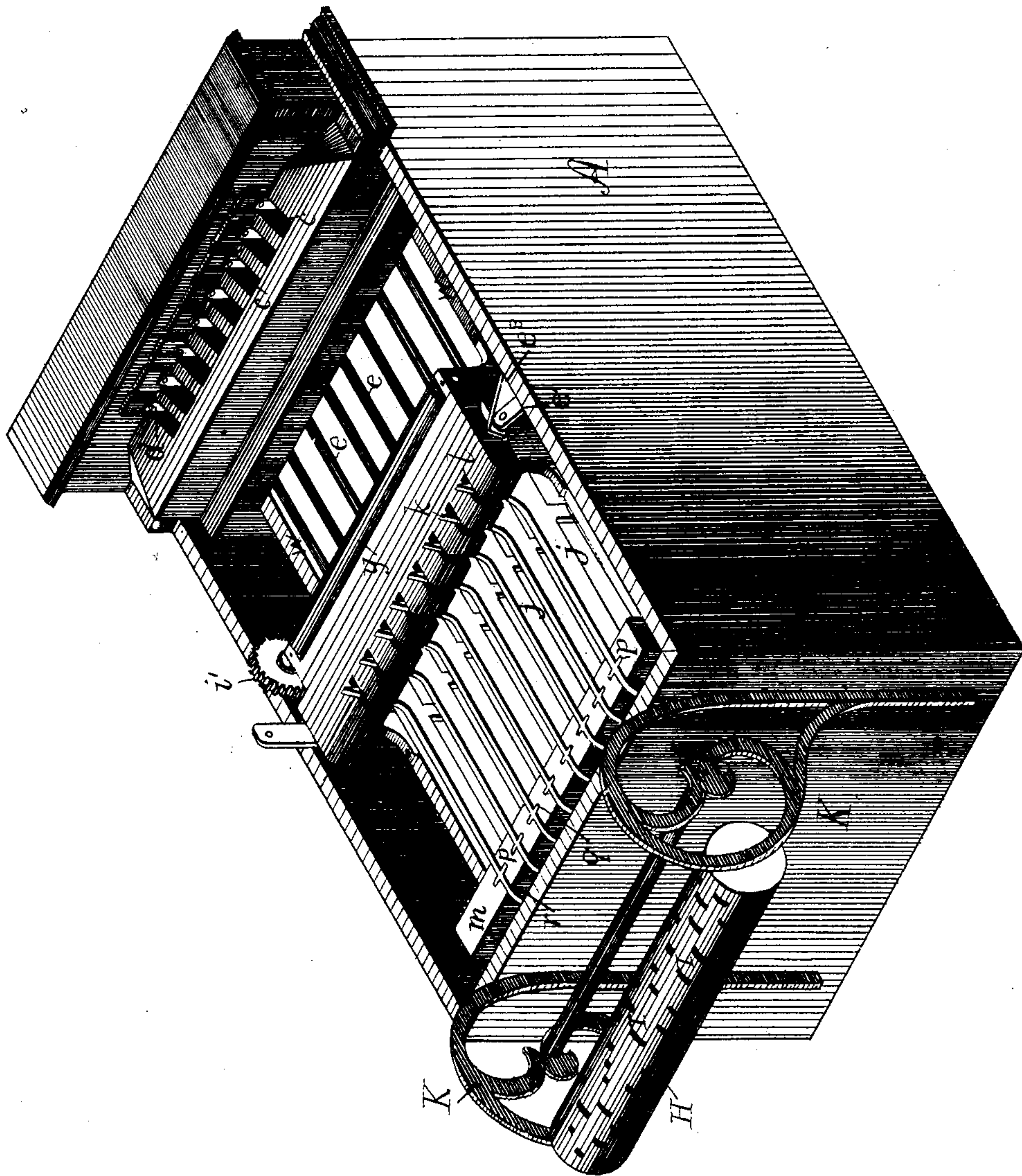
2 Sheets—Sheet 1.

J. McTAMMANY, Jr.  
Mechanical Musical Instrument.

No. 242,786.

Patented June 14, 1881.

*Fig 1*



Witnesses.  
Geo. H. Hays & Co.  
Attest.

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F. Curtis, Atty.

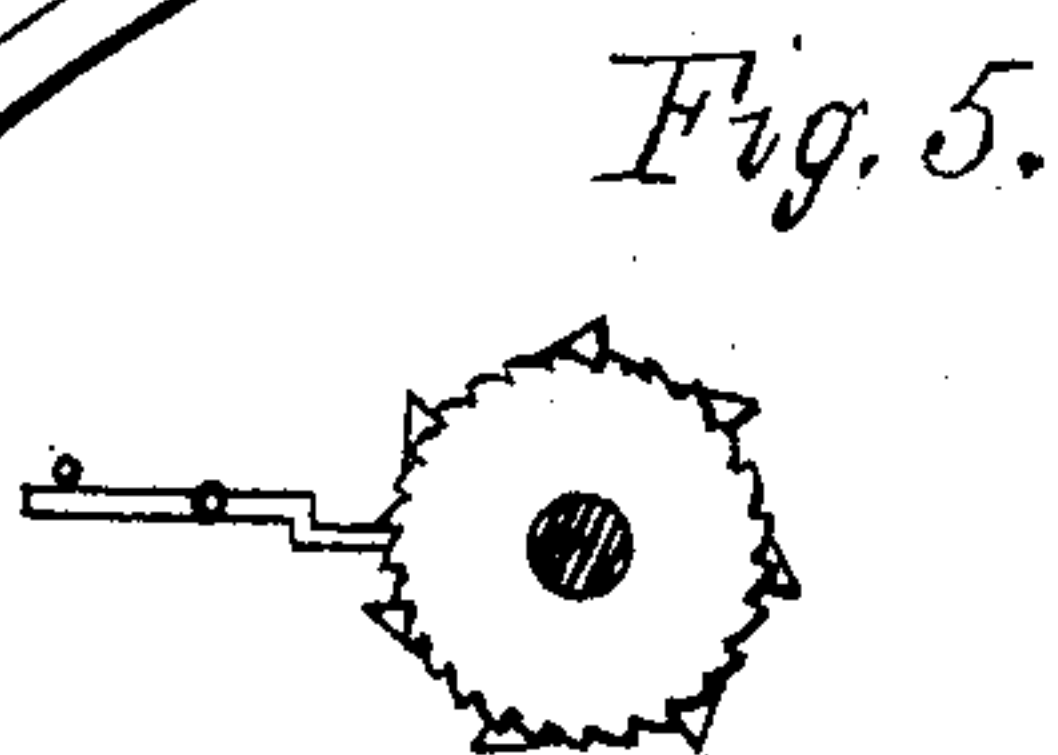
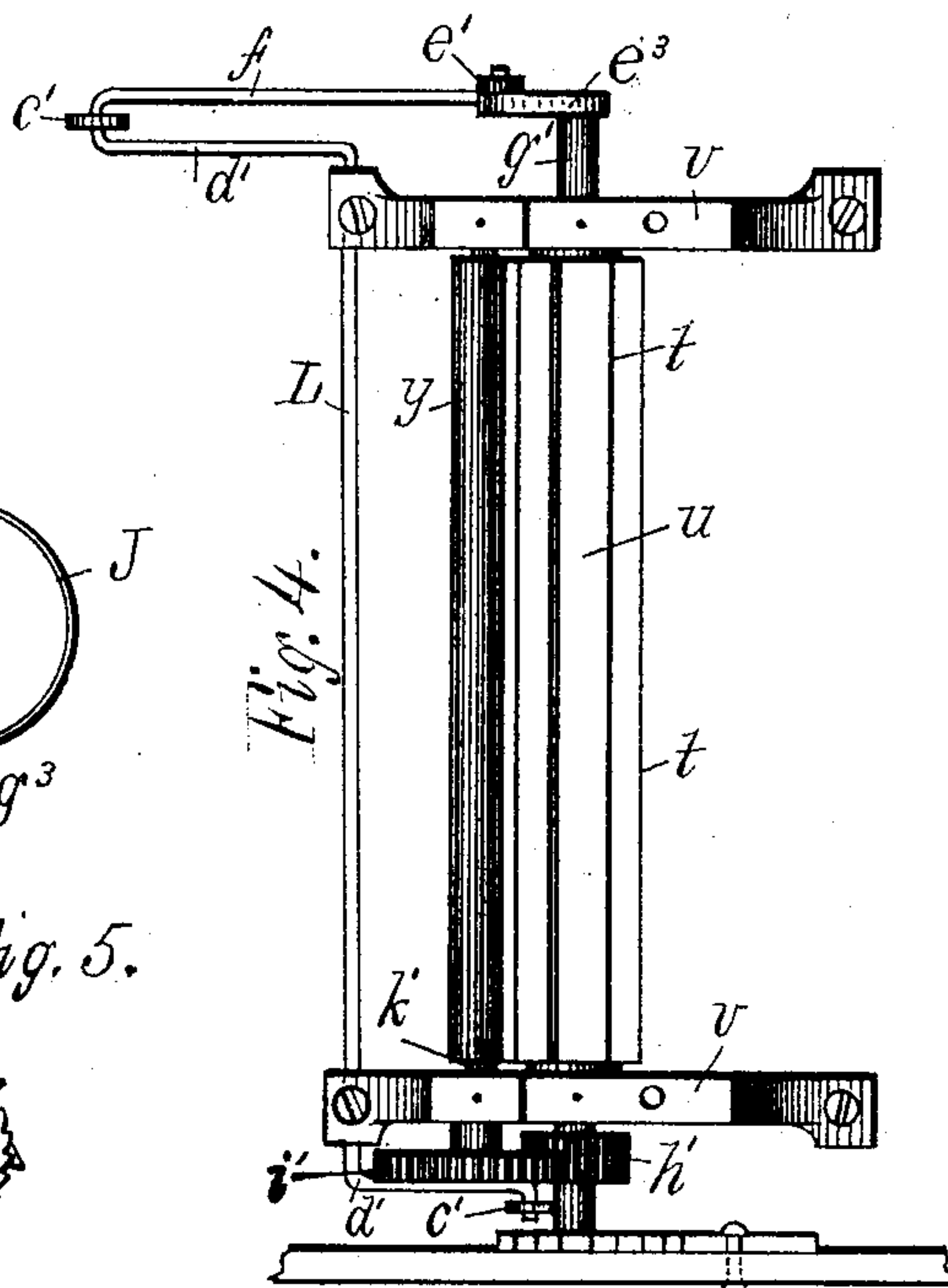
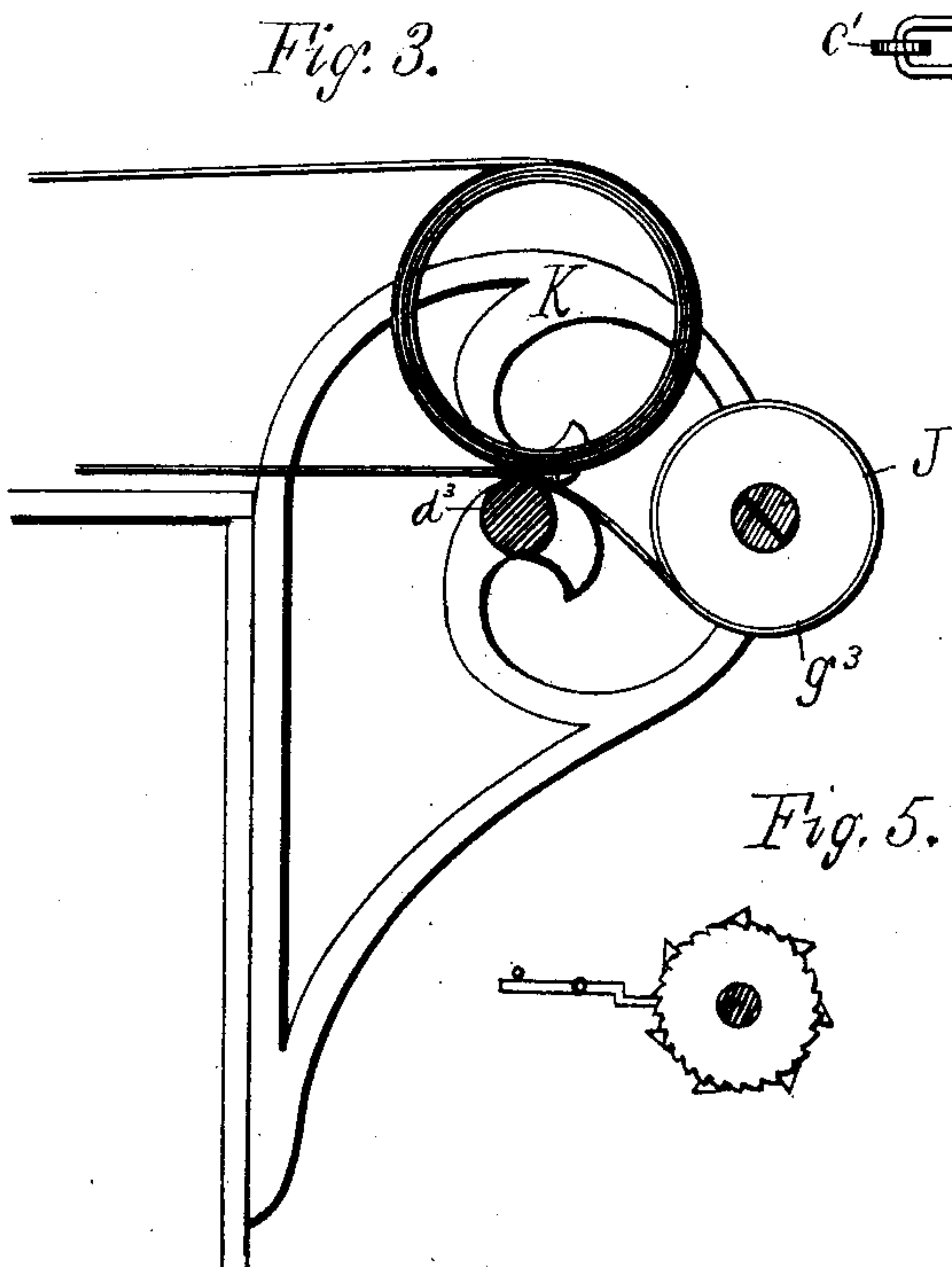
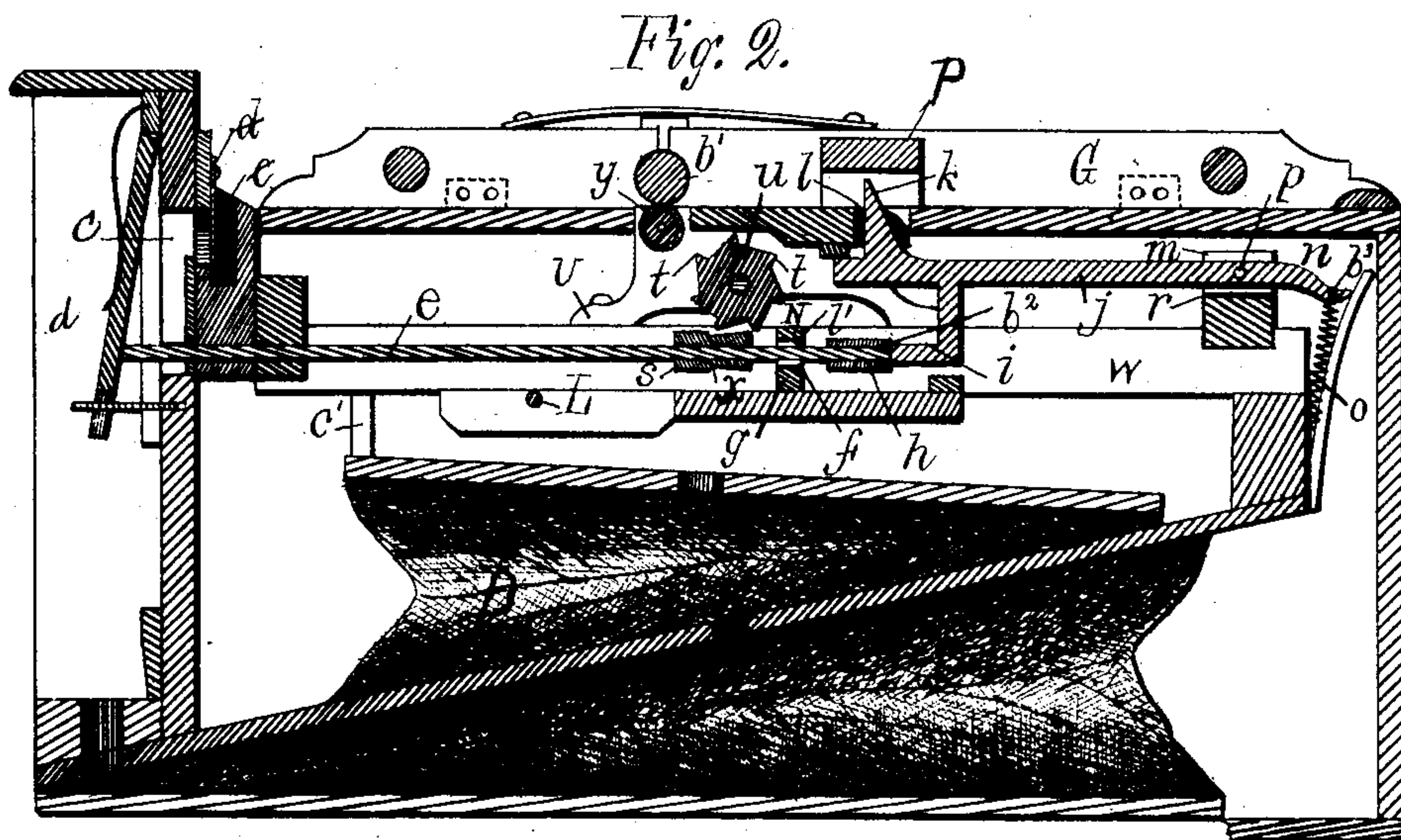
(No Model.)

2 Sheets—Sheet 2.

J. McTAMMANY, Jr.  
Mechanical Musical Instrument.

No. 242,786.

Patented June 14, 1881.



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Inventor.  
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# UNITED STATES PATENT OFFICE.

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## MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 242,786, dated June 14, 1881.

Application filed March 22, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN McTAMMANY, Jr., of Cambridge, county of Middlesex, and State of Massachusetts, have invented certain Improvements in Mechanical Musical Instruments, of which the following is a specification.

This invention relates to "mechanical musical instruments," so called—that is, those in which a sheet of paper perforated to represent the notes of a musical composition, and caused to travel over or in connection with the air-ducts of a reed-board, operates with the reeds to produce musical sounds, either by directly constituting a valve for the reed-openings or by means of an intervening mechanism actuating the valve of the reed-openings.

This invention relates to instruments which are operated or regulated by suitably-perforated sheets of paper or other material for the production of musical notes.

The nature of said invention consists partly in certain improvements in the mechanism for feeding such perforated sheets, partly in the peculiar construction and combination of the devices interposed between said sheets and the reed-valves, or their equivalents, and partly in other portions of the machinery, all as hereinafter more particularly set forth and claimed.

The drawings accompanying this specification represent, in Figure 1, an isometric elevation of an instrument embodying my improvements with the top plate removed and music-sheet wound up upon its reel. Fig. 2 is a vertical section of the instrument, Fig. 3 showing the music-sheet as it winds itself by friction against itself as it is unwound from the reel. Fig. 4 represents a detail view of the paper-feeding devices and certain parts attached thereto. Fig. 5 represents an end view of the toothed cylinder in detail.

In the above-mentioned drawings, A represents the case of the instrument as a square box, the valve-openings of the reed-cells being shown at *c c*, &c., and the valves covering the same at *d d*, &c.

To actuate the valves *d*, I employ a series of rods, *e e*, arranged in parallelism in a common horizontal plane, and finding loose bearings at their front ends in holes in the reed-board, and at their rear ends permitted slight vertical play in upright guides or slots *f f*, &c., in a horizon-

tal bar or bridge, *g*, that crosses the instrument laterally, the inner end or head, *h*, of each rod resting in its idle or normal position upon a shelf, *i*, formed upon the lower front part of each trip-lever. These trip-levers are shown at *j j*, &c., as arranged in parallelism, and in a common horizontal plane in rear of and in alignment with the valve-rods, but at a somewhat higher level, each lever being formed at its front end and over its shelf *i* with a nose, *k*, which extends upward through a slot, *l*, in the top board or plate of the instrument, while each lever, near its rear end, is pivoted to a horizontal transverse bar, *m*, spanning the rear end of the case of the instrument, the extreme rear end of each lever terminating in a curved prong, *n*, to which one end of a coiled spring, *o*, is connected by means of an eye, *b<sup>3</sup>*, formed upon the spring, the opposite end of such spring being, in turn, connected or secured to some convenient part of the instrument below the levers. To pivot the levers to their supporting-bar *m*, I cast upon each a pair of horizontal lateral trunnions, *p p*, which enter a common channel or saw-kerf, *q*, cut longitudinally in the upper edge of said bar, while the rear end of the body of the lever is received loosely within a groove, *r*, cut transversely in this bar, and crossing the channel *q* at right angles. By this construction and mounting of the levers and the manner of connecting the upper ends of the springs to them, I am enabled to manufacture this portion of the instrument at small cost, and to assemble the parts together with great ease and celerity. The transverse groove serves to support and steady the lever and remove from the trunnions the thrusts and strains which would otherwise fall upon them and cause them to twist and bind in their bearings.

Upon the rear part of each valve-rod I affix or form a cylindrical button, *s*, which is operated by the teeth *t t*, &c., of a horizontal fluted roller, *u*, disposed above the buttons and mounted in bearings in uprights or standards *v v*, erected upon longitudinal bars *w w*, secured to opposite sides of the interior of the instrument-case, each button being reduced in diameter from its rear end outward, as shown at *x*, in order to exert no friction upon the teeth of the roller, and in order that the rear end only of the but-



ton of each lever shall be engaged by such teeth.

The head *h* of each valve-rod is composed of or covered with india-rubber or other elastic or semi-elastic material, as shown at *b*<sup>2</sup>, in order, as before premised, to deaden the sound of its impact with the trip-lever, and the rear end of each button *s* may be similarly provided to cushion the blow of such button against the outer face of the bar *g*.

The lower roll for effecting the advance of the music-sheet is shown at *y* as disposed in front of and somewhat above and parallel with the fluted roller *u*, the journals of the feed-roll being mounted in the standards *v v*, before named, while the upper feed-roll is shown at *b'* as journaled within a horizontal guide-rack or frame, *G*, hinged to the top of the case *A*, and serving to permit of introduction of the music-sheet and to guide the movements of the latter.

The music-sheet is shown at *H*, and its apertures, which operate with the nose *k* of the lever *j*, at *I I*, &c., the said music-sheet being in its normal state wound upon a reel, *J*, disposed in rear of the case *A*, and journaled in brackets *K K*, extending rearward from such case, these brackets being of such size and shape as not only to insure the correct winding of the music-sheet about the reel by guiding it properly to the latter, but to steady and guide such sheet as it coils or winds itself after leaving the reel and passing through the instrument, as hereinafter explained.

To secure the end of the music-sheet to the reel *I* create in the periphery of the latter a longitudinal groove, *g*<sup>3</sup>, into which the end of the sheet is inserted, the friction of the sheet upon the reel, as it is coiled about it, serving to prevent escape of the end within the groove. This method of connecting the sheet with the reel also enables me to readily apply or remove such sheet.

*L* in the drawings represents a longitudinal rock-shaft disposed transversely of the instrument below the valve-rods, and mounted in the bars *w w*, before named, the ends of this shaft being connected with the bellows-feeders *D D* by pitmen *e' e'*, connecting with cranks *d' d'* of the shaft, while the rockings of the shaft itself are effected by a pitman, *e'*, one end of which is connected to a crank, *e*<sup>3</sup>, on the end of the shaft *g'* of the fluted roller *u*, and the other end to an arm or crank, *f'*, from the rock-shaft, the rotations of the fluted roll-shaft thus being made to effect rockings of the rock-shaft and working of the feeders *D D*.

The shaft *g'* of the fluted roll *u* is the driving-shaft of the instrument, and in the present instance is rotated by a crank affixed to its front end, while to drive or rotate the lower feed-roll, *y*, I affix to the shaft of the fluted roll *u* a toothed pinion, *h'*, which engages and drives a spur-gear, *i'*, affixed to the adjacent end of the said feed-roll or its shaft *k'*.

*N* in the accompanying drawings represents a horizontal bar secured to the top of the guide

bar or bridge *g*, and padded on its under side, as shown at *l'*, to arrest the upward movements of the valve-rods and cushion their impact with the bar as they are raised by the lifting of the free ends of the levers *j*, when the noses of the latter enter the perforations in the music-sheet.

The operation of this instrument is as follows, it being understood that the loose end of the music-sheet has been introduced between the two feed-rolls and within the guide-rack, and the noses of the entire range of trip-levers resting against the integral or imperforate part of the music-sheet, in which case the head *h* of each valve-rod remains immediately over the shelf *i* of the adjacent lever, and the entire series of rods are at their extreme rearward and idle position: As the music-sheet advances by the rotation of the feed-rolls and is unwound from the reel, and as its apertures arrive opposite some one or more of the noses of the levers *j*, such nose enters the aperture and allows the lever, with its shelf *i*, to rise by the action of the spring *o* and lift the rear end of the adjacent valve-rod into such a position that its button is engaged by the next approaching tooth of the fluted roll *u*, and by such tooth driven forward, the front end of the rod abutting against and opening the valve of the reed with which such rod operates, and thereby sounding the note of such reed, the valve-rod being carried forward by the tooth beyond the front edge of the shelf of the lever, and when the tooth leaves it it drops in front of such shelf, and is held in this position and so as to hold the valve open until the lever is lowered, the shelf of such lever passing below the head of the rod, when such rod is driven back by the spring of the valve, and its head *h* rests over the shelf of the lever.

It will be seen that so long as the opening in the valve-sheet remains over the nose of the lever the latter remains elevated, and its shelf prevents retraction of the valve-rod and closing of the reed-valve. Therefore the length of the opening in the sheet determines the length or duration of the note.

By the employment of a cylindrical button to the valve-rod, to operate with the teeth of the fluted roller, the engagement of the rod and roller is insured should the rod turn in its bearings.

By the employment of the valve-rods as a direct agent to impart the action of the teeth of the fluted roller to the valve of the reed-openings, I obtain an action which may be produced at small cost and which is not liable to become disarranged.

As soon as a sufficient portion of the first end of the music-sheet has passed from the reel and through the feed-rollers to require being disposed of, I return such end rearward over the guide-rack *G* and coil or wind it about itself once or twice, and then deposit it between the brackets *K K* and upon or against the periphery of the portion unwound from and immediately in advance of the reel, the



brackets under these circumstances serving to guide the loose portion of the sheet. As the sheet is unwound from the reel and accumulates above the top of the instrument its coiled portion, resting upon that in front of the reel, is rotated by friction upon the latter, the result being that as the sheet leaves the reel and passes through the instrument it returns and is wound upon itself until the last note is played and the reel is empty, and the entire sheet, or practically the entire sheet, remains in a loose coil above the reel. To return the sheet to its original position the guide-rack is raised and the sheet rewound upon the reel by turning the latter. To aid in supporting the sheet in front of the reel I attach a bar or idle-roll,  $d^3$ , to and between the brackets and in front of the reel.

One advantage of the above-described method of supporting and winding the music-sheet will be seen in the fact that I am enabled to more easily and expeditiously apply or remove various compositions than if both ends of the sheet were secured to reels and wound from one to the other.

By mounting the lower feed-roll shaft by itself, as stated, and connecting it with a separate shaft by gear or friction wheels, I am enabled to readily and expeditiously detach such roll for repairs or otherwise.

P in the drawings represents a horizontal bar secured transversely within the frame or guide-rack G and over the noses of the levers  $j$ , such bar being for the purpose of depressing the music-sheet down upon the top of the instrument and about the noses of the levers, and has lateral grooves Q Q, &c., to permit the said noses to rise through the perforations of the sheet, as well as to permit of free escape of the musical notes from the reed-ducts. In former application of mine I have shown a peripherally-grooved roller pivoted to the guide-rack in lieu of the presser-bar P. In some respects the stationary bar is preferable.

What I claim as new, and desire to secure by Letters Patent, in a mechanical musical instrument, is—

1. In combination with the fluted roll and reed-valves, the valve-rods actuated by said roll and bearing immediately against said valves, substantially as set forth.

2. In combination with the trip-levers, the fluted roll and the reed-valves, all arranged substantially as set forth, the valve-rods operated by said roll and levers and bearing immediately against said valves.

3. In combination with fluted roll  $u$ , the valve-rods  $e$  and the buttons  $s$ , each button being reduced in diameter from its rear end toward its middle portion, substantially as shown.

4. In combination with fluted roll  $u$  and valve  $d$ , the valve-rod  $e$ , provided with cylindrical button  $s$ , substantially as set forth.

5. In combination with valve-rod  $e$ , having button  $s$  and a head,  $v$ , the fluted roll for operating on said button, and the trip-lever, which has a shelf for supporting said head until the fluted roll operates, as stated.

6. A trip-lever having trunnions formed on its side, in combination with a supporting-bar channeled to receive the trunnions of the lever and transversely channeled to receive the body thereof.

7. In combination with a fluted roll and valve-rod, a trip-lever provided with a shelf, which is arranged and adapted to support the head of the valve-rod until the latter is drawn off said shelf by said roll, and afterward acts as a stop and brace for the rear end of said valve-rod to hold the valve open.

8. In combination, the lower feed-roll, the driving-shaft, the rock-shaft, and the bellows-feeders, the rock-shaft being connected with and operated by the driving-shaft, and the whole being in manner as stated.

9. The trip-lever bearing the nose to enter the perforations in the music-sheet, and the shelf, arranged to operate, as described, with the head of the valve-rod.

10. The combination of the music-sheet, the trip-lever, with its nose and shelf, the fluted or toothed roller, the valve-rod, with its button and head, and the reed-cell and valve.

11. In a mechanical musical instrument, the combination of the fluted roller and the lower feed-roll, connected by gear or friction wheels.

12. The stationary grooved bar P, in combination with the guide G and levers  $j$ .

13. The method herein described of operating the music-sheet in a mechanical musical instrument, which consists in securing one end to a reel, and, after leading the free end through the instrument, returning it outside of the same and coiling it by contact with the portion unwinding from the reel, substantially as set forth.

J. MCTAMMANY, JR.

Witnesses:

F. CURTIS,

H. E. LODGE.