(No Model.) 4 Sheets—Sheet 1.

E. W. FUNK.

MUSIC TURNER.

No. 601,644. Patented Apr. 5, 1898.

FIG. 8.

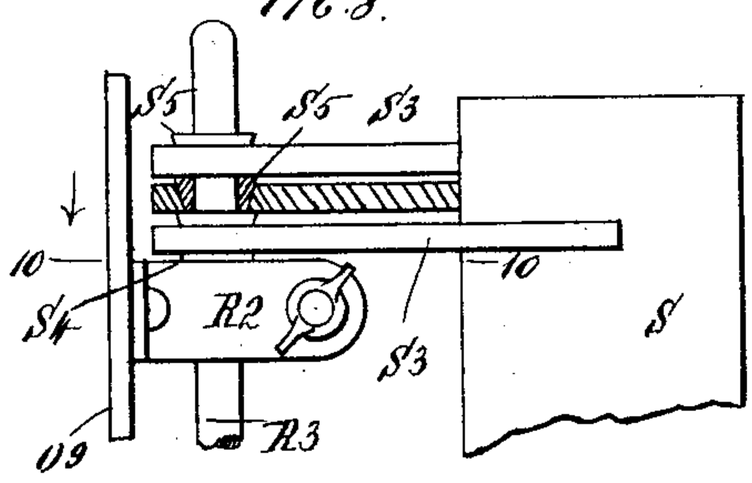


FIG. 9.

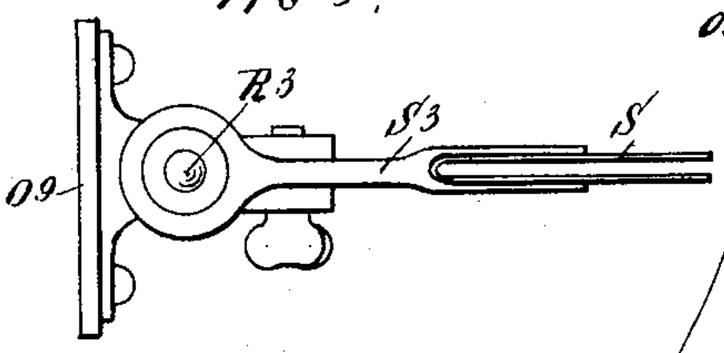


FIG. 10.

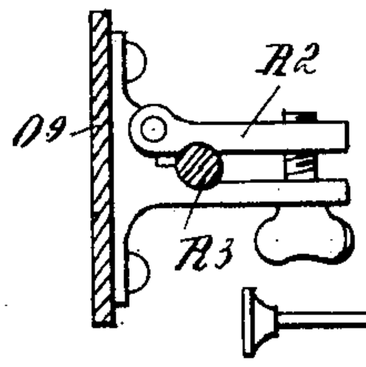
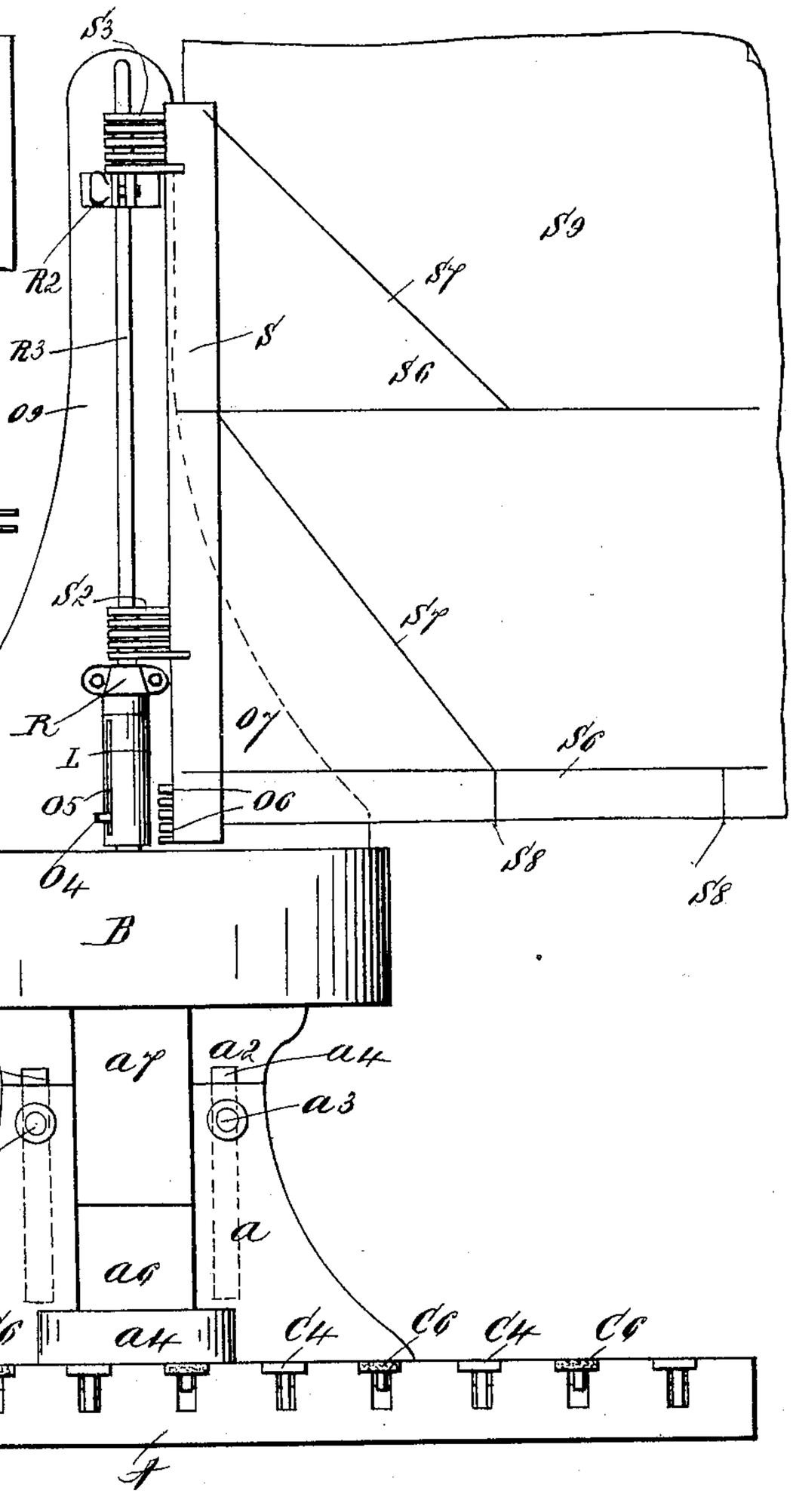


FIG. 1.



WITNESSES:

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(No Model.)

4 Sheets—Sheet 2.

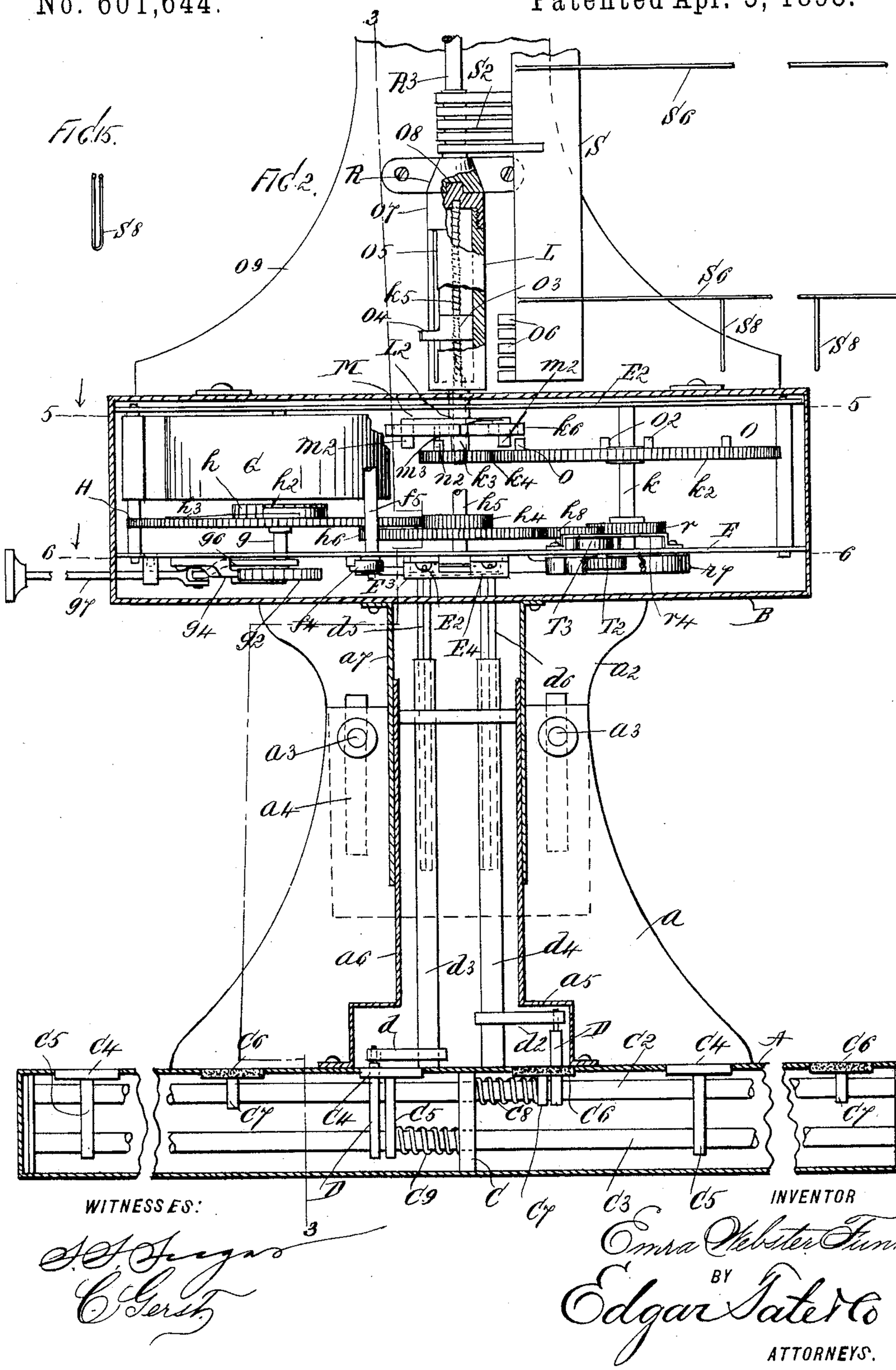
E. W. FUNK.

MUSIC TURNER.

No. 601,644. Patented Apr. 5, 1898.

FIG. 1.

FIG. 2.



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(No Model.) 4 Sheets—Sheet 3.

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No. 601,644. Patented Apr. 5, 1898.

FIG. 3

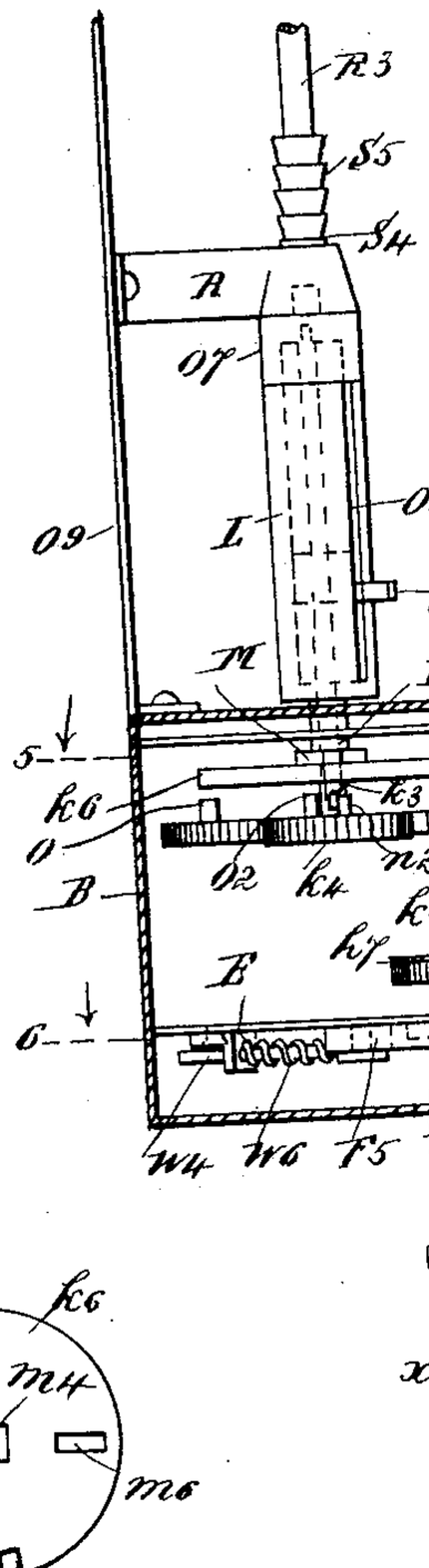


FIG. 1.

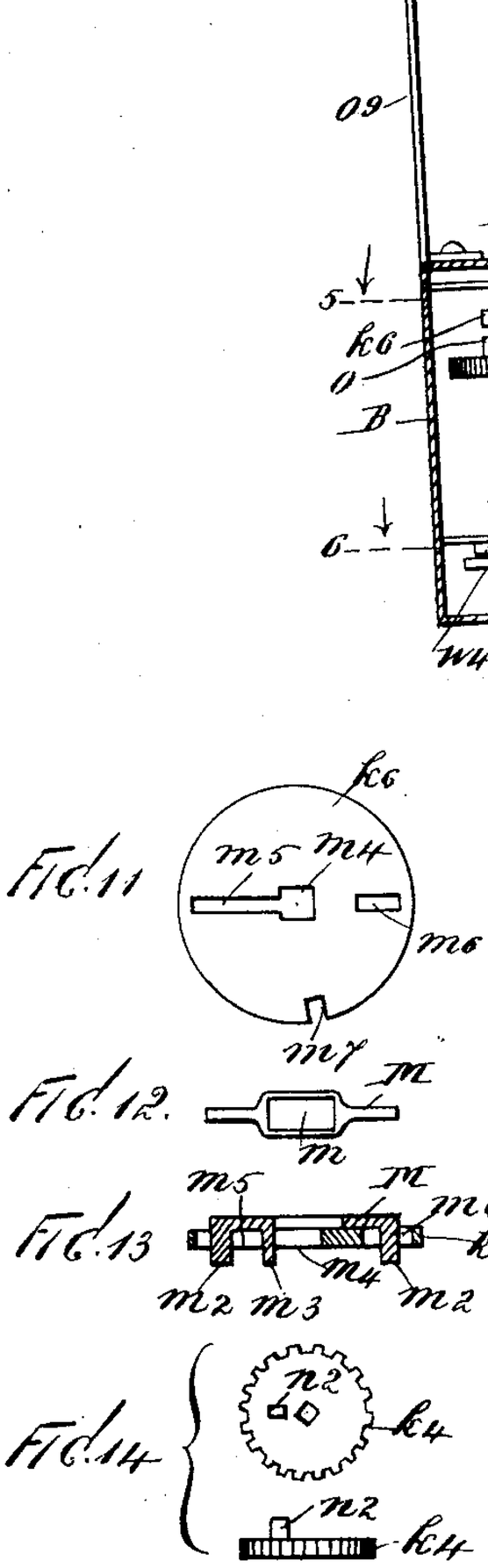


FIG. 12.

FIG. 13

FIG. 14

FIG. 7.

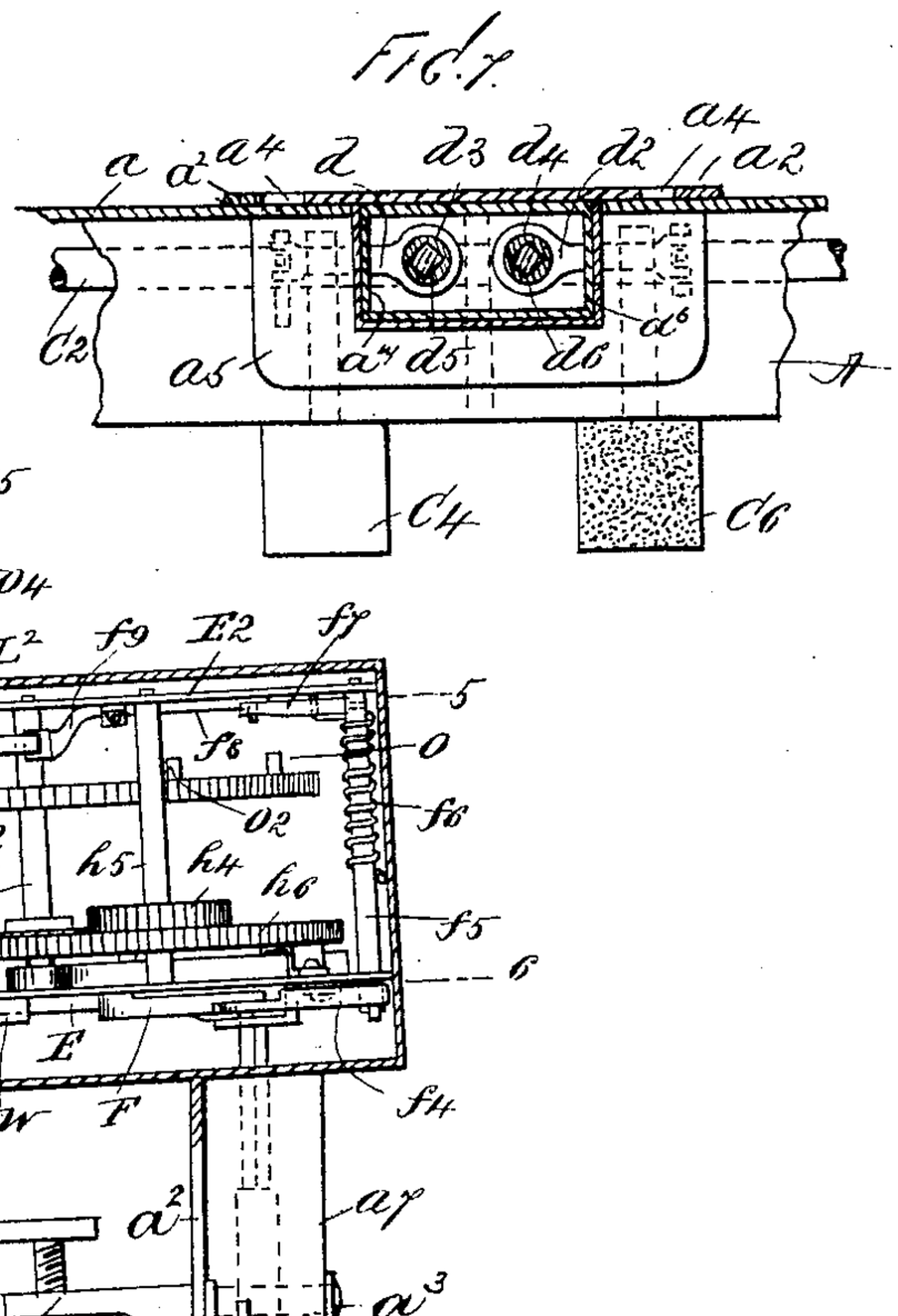


FIG. 16.

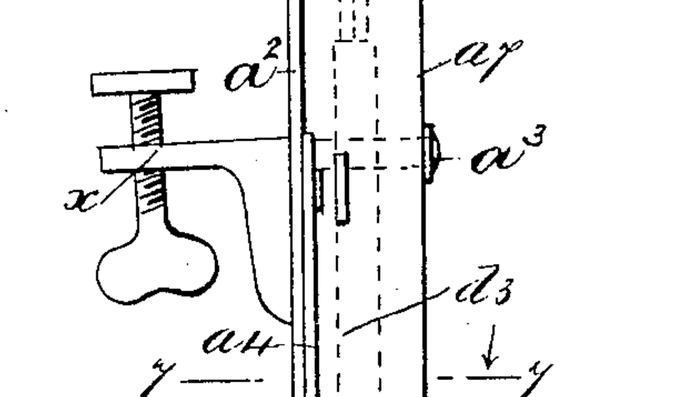
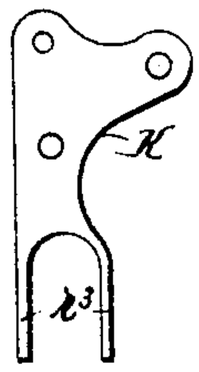


FIG. 15.



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(No Model.) 4 Sheets—Sheet 4.

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MUSIC TURNER.

No. 601,644. Patented Apr. 5, 1898.

FIG. 4.

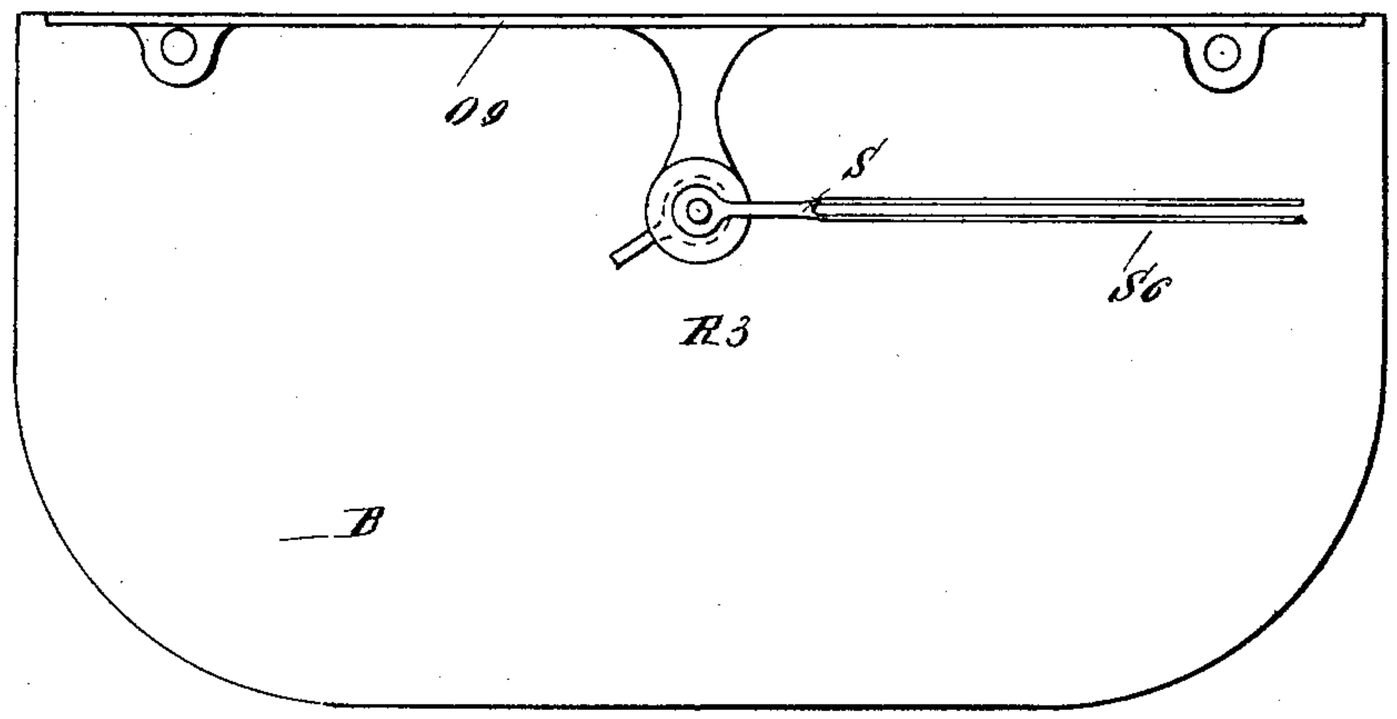


FIG. 5.

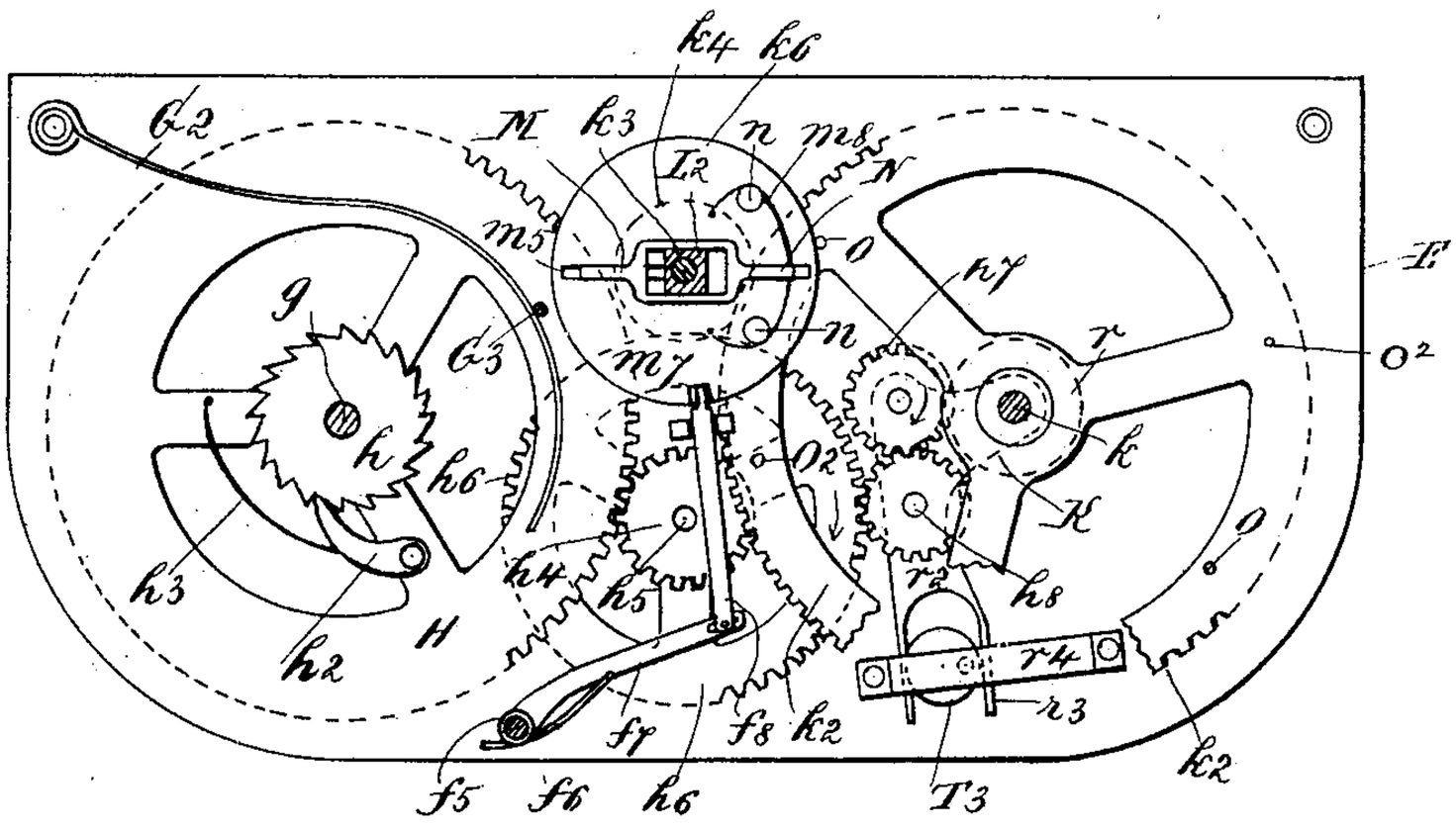
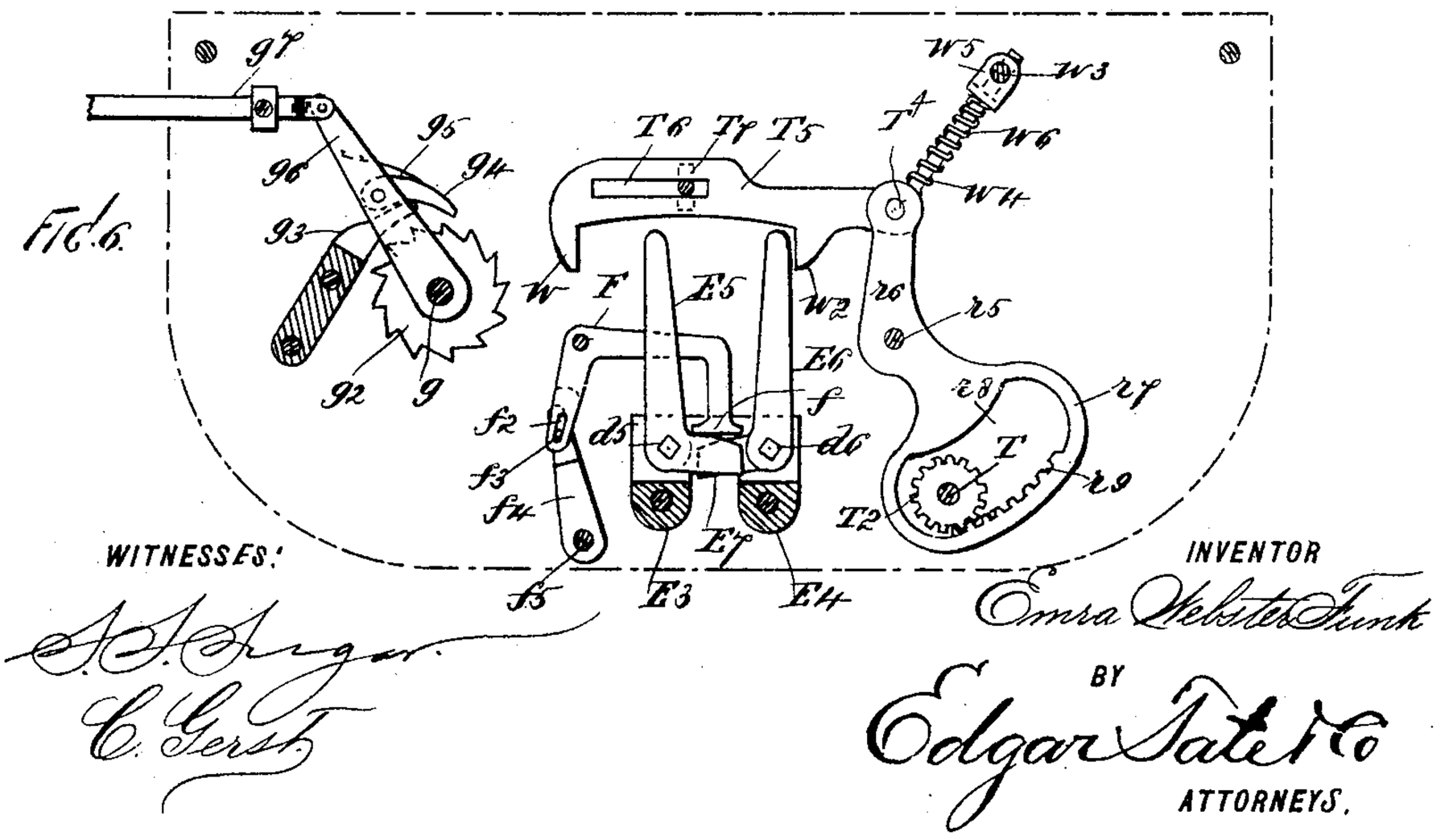


FIG. 6.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EMRA WEBSTER FUNK, OF CANTON, MINNESOTA.

MUSIC-TURNER.

SPECIFICATION forming part of Letters Patent No. 601,644, dated April 5, 1898.

Application filed April 15, 1897. Serial No. 632,330. (No model.)

To all whom it may concern:

Be it known that I, EMRA WEBSTER FUNK, a citizen of the United States, residing at Canton, in the county of Fillmore and State of Minnesota, have invented certain new and useful Improvements in Music-Turners, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to sheet-music turners; and the object thereof is to provide a device of this class which is adapted to be used on a stand or other support or to be connected with the piano or other musical instrument, a further object being to provide an improved sheet-music turner by means of which separate sheets of music may be quickly and easily turned in either direction by manipulating keys which are connected with and form a part of the operative mechanism of the device.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by the same letters of reference in each of the views, and in which—

Figure 1 is a front view of my improved music-turning device; Fig. 2, a sectional front view, on an enlarged scale, with a portion of the upper part thereof broken away; Fig. 3, a sectional side view of a portion of the upper part of the turner broken away; Fig. 4, a plan view of the music-turner; Fig. 5, a section on the line 5 5 of Figs. 2 and 3; Fig. 6, a section on the line 6 6 of Figs. 2 and 3; Fig. 7, a section on the line 7 7 of Fig. 3; Fig. 8, a sectional side view of the upper part of the turner; Fig. 9, a plan view thereof; Fig. 10, a section on the line 10 10 of Fig. 8; Fig. 11, a plan view of a detail of the construction; Fig. 12, a similar view of another detail of the construction; Fig. 13, a transverse section of the parts shown in Figs. 11 and 12 connected; Fig. 14, a plan and side view of a pinion which forms a part of the construction; Fig. 15, a front view of a part of the frame of the sheet-support, and Fig. 16 a plan view of a reverse gear-plate which forms a part of the device.

In the practice of my invention I provide an oblong base box or casing A, with which is connected at the back thereof an upright plate a, to which is secured a supplemental upright plate a^2, and the connection between the plates a and a^2 is made by means of pins or screws a^3, which pass therethrough, and these plates form a support for an oblong box or casing B; and this support is vertically adjustable, the plate a^2 being provided with vertical slots a^4, through which the pins or screws a^3 pass.

Secured to the top of the base box or casing A is a casing a^5, which is provided with an upwardly-directed extension a^6, which is also composed of two parts, the upper part being shown at a^7 and being secured to the bottom of the box or casing B, and the parts a^6 and a^7 are vertically adjustable, one of said parts telescoping in the other, and it will thus be seen that the box or casing B is supported above the oblong base box or casing A and is vertically adjustable.

Within the base box or casing A and centrally thereof is a vertical partition C, and mounted in said base box or casing are two horizontal or transverse shafts C^2 and C^3, said shafts being mounted one above the other, and the lower shaft C^3 is provided with a plurality of white keys C^4, which are connected therewith by arms C^5, and the keys C^4 project at the front of the base box or casing, as shown in Fig. 3, and the upper shaft C^2 is provided with a plurality of black keys C^6, which are connected therewith by arms C^7, and the arms of the black keys also project at the front of the base box or casing.

Mounted on the shaft C^2 is a spiral spring C^8, one end of which is secured to the partition-plate C and the other to one of the arms C^7, and mounted on the shaft C^3 is a spiral spring C^9, one end of which is secured to the partition C and the other to one of the arms C^5, the object of these springs being to return the keys to their proper position after use.

Each of the shafts C^2 and C^3 is also provided with an upwardly-directed arm D, and these arms pass vertically through the top of the base box or casing A and through slots formed in the arms d and d^2, which are secured to upright shafts d^3 and d^4, respectively.

The shafts d^3 and d^4 project upwardly through the extension a^6 of the casing a^5 and are hollow at their upper ends, the openings

therein being angular in cross-section, as shown in Fig. 7, and passing into the shaft d^3 is a rod d^5, which is angular in form in cross-section, and mounted in the shaft d^4 is another rod d^6, which is also angular in cross-section, and the rods d^5 and d^6 pass through the bottom of the box or casing B.

The supplemental box or casing B is provided with two horizontal partition-plates E and E^2, and Fig. 6 is a plan view of the mechanism connected with the bottom of the plate E, said plate being removed, while Fig. 5 is a plan view of the mechanism mounted above the plate E, the upper portion of the box or casing B and the plate E^2 being removed.

Secured to the bottom of the plate E, centrally thereof, are two keepers E^3 and E^4, (best shown in Figs. 2 and 6,) and the rods d^5 and d^6 project through the bottoms of these keepers, and mounted on the end of the rod d^5 is a lever E^5, the shorter arm of which projects in the direction of the rod d^6, and mounted on the rod d^6 is a lever E^6, the shorter arm of which projects toward the shorter arm of the lever E^5, and the shorter arms of the levers E^5 and E^6 overlap each other, as shown at E^7.

The longer arms of the levers E^5 and E^6 project backwardly, as shown in Fig. 6, and pivotally supported adjacent to the side of the longer arm of the lever E^5 is an angular lever F, one arm of which is provided with a crosshead f, which abuts against the shorter arms of the levers E^5 and E^6, and the other arm of the lever F is provided with a slot f^2, through which passes a pin f^3, which is secured to a dog f^4, which is mounted on a shaft f^5, on which is placed a spring f^6, the lower end of which is connected with the shaft f^5, and below the plate E^2 is an arm f^7, against which one end of said spring bears, and the arm f^7 is pivotally connected with a rod f^8, which is provided with a downwardly-directed extension f^9, this construction being best shown in Figs. 3 and 5.

Mounted in one end of the box or casing B and between the plates E and E^2 is a spring-drum G, which is mounted on a shaft g, and the shaft g passes through the plate E and is provided below said plate with a ratchet-wheel g^2, as shown in Figs. 2 and 6, and secured to the plate E is an arm g^3, adjacent to which is pivoted a pawl g^4, which is operated upon by a spring g^5, and said pawl is adapted to operate in connection with the ratchet-wheel g^2, and secured to the shaft g is a lever g^6, to which is pivoted a rod g^7, which extends through the adjacent end of the box or casing B, and the object of the pawl g^4 is to prevent the operation of the drum G when the music-turning device is not in use. The shaft g is also provided below the drum G with a large gear-wheel H, which is loosely mounted thereon, and secured to said shaft adjacent to said gear-wheel is a ratchet-wheel h, and pivotally connected with said gear-wheel is a pawl h^2, which operates in connection with said ratchet-wheel, and secured to said gear-wheel is a spring h^3, which operates to force said pawl into connection with said ratchet-wheel h.

The gear-wheel H constitutes the main drive-wheel and operates in connection with a pinion h^4, mounted on a shaft h^5, on which is mounted a large gear-wheel h^6, which is adapted to operate in connection with either of two pinions h^7 and h^8, which are pivoted to or mounted on a reverse gear-plate K, which is shown in Figs. 5 and 16 and which is mounted on a shaft k, on which a large gear-wheel k^2 is mounted.

Passing upwardly through the upper part of the box or casing B is a shaft k^3, on the lower end of which is mounted a pinion k^4, which operates in connection with the gear-wheel k^2, and said pinion and said gear-wheel are the principal parts of the operating mechanism of this device, and the teeth on the pinion are twenty in number, while those on said gear-wheel k^2 are eighty in number.

Mounted above the box or casing B is a tubular cylinder L, which is provided at its lower end with a depending tubular extension L^2, and the shaft k^3 projects upwardly into said tubular cylinder L and through the tubular extension L^2 thereof and is formed into a screw k^5, and mounted on the lower end of the tubular extension L^2 of the cylinder L, directly over the pinion k^4, is a disk or wheel k^6, which is secured to the lower end of the tubular extension L^2, and mounted on said tubular extension above the disk or plate k^6 is a trip M, which is shown in Figs. 2 and 5 and in detail in Figs. 12 and 13, and said trip M is provided with an oblong central slot m and at each end with a depending arm m^2, and adjacent to one end of said slot is a depending arm m^3, and the disk or plate k^6 is provided centrally with an angular opening m^4, which is provided at one side with a slot or extension m^5, and said disk is provided opposite the slot or opening m^5 with a short slot or opening m^6 and in the perimeter thereof at one edge with a notch or recess m^7, which is adapted to receive the end f^9 of the rod f^8.

The trip M rests on the disk or plate k^6, and the arms thereof pass downwardly through the slots formed in said disk, as shown in Figs. 13 and 2, and said trip is adapted to move crosswise of said disk or plate and is held in position by a small spring m^8, which passes through one end thereof, as shown at N in Fig. 5, and the ends of said spring are secured to said disk or plate k^6, as shown at n, and said spring is adapted to actuate said trip in both directions.

The pinion k^4, which is shown in Figs. 3 and 14, is provided with a pin n^2, which is so located as to strike the trip M or the central depending arm m^3 thereof and to carry the disk or plate k^6 and the cylinder L around with it until released by the trip and the wheel k^2.

The gear-wheel k^2 is provided with pins O

and adjacent thereto with pins O^2, and in the operation of the device the pinion k^4 must make nearly one-half a revolution, with the disk or plate k^6 remaining stationary, and this operation will bring one of the pins O around so that it will come in contact with the end of the trip M, and this operation will force the trip M over to the left, so that the pin n^2 on the pinion k^4 and the arm m^3 on the trip will pass each other and allow the pinion k^4 to make one revolution, and this operation will turn the vertically-movable block O^3, mounted on the screw k^5 in the cylinder L. This block is provided with an arm O^4, which projects through a vertical slot O^5, formed in the cylinder L, and is adapted to operate the frames by which the sheets of music are held, said frames being provided with projections O^6, in connection with which the arm O^4 of said block operates.

The cylinder L is composed of two parts, the upper end O^7 thereof being detachable, and said cylinder is provided with a tenon O^8, and secured to the back of the box or casing M or formed thereon is an upwardly-directed plate O^9, to which are secured two brackets R and R^2, and the lower bracket R is provided with a socket which receives the tenon O^8, as shown in Fig. 2, and supported by the brackets R and R^2 is a shaft R^3.

The frames S, by which the separate sheets of music are supported, are connected with arms S^2 and S^3 at their inner ends, and these arms S^2 and S^3 are of the form shown in Figs. 8 and 9, and each set of arms is connected with the shaft R^3, as shown in Fig. 8. A thin washer S^4 is placed beneath the lower arm S^3 of the upper set, and each arm is provided in its upper side with a large conical opening in which a conical washer S^5 is placed, and one of these conical washers is employed in connection with each arm, and the lower arm rests upon the washer S^4, while the next arm thereover rests on the conical washer, which is placed in the end of the lower arm, and so on to the last or upper arm. The lower arms S^2 of the music-sheet frames are supported in the same manner, and the music-sheet frames consist of strips of thin metal which are bent longitudinally, as shown in Fig. 9, and to which the arms S^2 and S^3 are secured, and secured to the separate sides of these sheets are outwardly-directed wire arms S^6, which are supported by diagonal wires S^7, and the lower wire S^6 is provided with wire loops S^8, which are of the form shown in Fig. 15 and which are adapted to receive and hold the lower ends of the sheets of music, as shown in Fig. 1. The diagonal wires S^7 of these frames are not absolutely necessary and may or may not be employed, and in Fig. 1 I have shown at S^9 a sheet of music mounted in one of said frames, and one of the lugs or projections O^6 is secured to the lower part of each of these frames, one above the other, as shown in Figs. 1 and 2.

Referring again to Figs. 2, 5, and 6, it will be seen that the pinions h^7 and h^8 on the reverse gear-plate K are adapted to operate in connection with a smaller gear-wheel r on the shaft k of the wheel k^2, this gear-wheel being shown in full lines in Fig. 2 and in dotted lines in Fig. 5, and the reverse gear-plate K is provided with an arm r^2, which is provided with a fork r^3, the separate arms of which pass beneath a keeper r^4, secured to the plate E, and beneath the plate E is pivoted at r^5 a lever r^6, the forward end of which is provided with an oblong elliptical head r^7, in which is formed a curved or segmental opening r^8, the outer wall of which is provided with gear-teeth, as shown at r^9, and mounted within the curved or segmental opening r^8 on a shaft T is a pinion T^2, which operates in connection with said gear-teeth, and said shaft T projects upwardly through the plate E and is eccentrically connected with a cam or disk T^3, which operates in the fork r^3 of the reverse gear-plate.

The rear end of the lever r^6 is pivotally connected at T^4 with a lever T^5, which projects longitudinally of the plate E and which is provided with an oblong slot T^6, in which works a pin T^7, which is secured to the plate E, and this lever is provided at its outer end with a forwardly-directed dog W and near its pivoted end with a similar forwardly-directed dog W^2, and these dogs operate in connection with the levers E^5 and E^6, and pivotally connected with the rear portion of the plate E at W^3 is a shaft W^4, which is pivotally connected with the pivotally-connected ends of the levers r^6 and T^5 and which is provided with a head W^5, between which and its pivotal connection with the levers R^6 and T^5 is a spiral spring W^6, which operates in connection with said levers.

In the accompanying drawings I have shown means for operating five music-sheet frames; but it will be understood that any desired number of these frames may be employed, and the operation will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof.

When one of the white keys C^4 is depressed, there is a rotary motion given to the shaft C^3, with which it is connected, and a corresponding rotary motion given to the corresponding shaft d^3 and to the rod d^5, which is mounted therein, and the longer arm of the lever E^5 is thrown outward or to the left and comes in contact with the dog W on the lever T^5, and said lever is also moved to the left, and as the longer arm of the lever E^5 is thrown outwardly the shorter arm thereof will be thrown backward and will strike the cross-head f of the lever F and will throw the slotted end of the lever F at f^2 inward, and this operation will force the end of the dog f^4 in the same direction, thereby transmitting a slight rotary motion to the shaft f^5, to which the said dog is attached, and the arm f^7 will be thrown forward and will in turn draw the shaft f^8 for-

ward and disconnect it from the notch m^7 in the disk k^6, thereby allowing said disk k^6 and the cylinder L to turn, and the tension of the spring-drum G is transmitted through the several gear-wheels to the wheel k^2 and from the wheel k^2 to the pinion k^4 and the parts connected therewith, and the disk k^6 is carried around by the pinion k^4 until released by the trip M, which is moved to one side to allow the points or projections m^3 and n^2 to pass each other, and this operation will allow the cylinder L to make a temporary stop while the disk k^6 and the screw k^5 make one revolution or until the points or projections m^3 and n^2 come in contact again. The block O^3 is carried downwardly by the revolution of the screw k^5, so that the arm O^4 thereof will pass under the projection O^6 of one of the music-frames and into position to move the next frame, and the disk k^6 and the cylinder L are carried around about one-quarter of a revolution until stopped by the shaft f^8, which drops into the notch m^7 in said disk, where it is held firmly until again released by the depression of one of the keys C^4 or C^6.

The reverse movement or that by which the music-frames are turned back to the right is substantially the same as that by which said frames are turned to the left; but in this operation one of the black keys C^6 is depressed, whereby a rotary motion is transmitted through the shaft d^4 to the arm f^7, which will be thrown outward, and the levers T^5 and T^6 will be turned to the right and the head r^7 of the lever r^6 will be moved to the left and will operate the pinion T^2 and transmit a rotary motion to the shaft T, and the eccentrically-mounted disk T^3 will operate the reverse plate K and throw the slotted or yoke-shaped end thereof to the right, thereby throwing the pinion h^7 into operation and the pinion h^8 out of operation, and this operation of said parts will reverse the movement of the wheel k^2, and the movement of the pinion k^4 and the screw k^5 will also be reversed, and said screw k^5 will make one revolution and the points or projections m^3 and n^2 will come in contact, the disk k^6 remaining stationary. This operation will cause the block O^3 to rise to a position in which it will engage with one of the lugs or projections O^6 and turn back the music leaf or frame that has been previously dropped or turned to the left, and the disks k^6 and cylinder L will be carried around until the arm O^4 of the block O^3 projects to the right, which will bring the trip M, or the end nearest the point or projection m^3 thereof, and one of the pins O on the wheel k^2 into contact, when said trip will be moved to the left, allowing the points or projections m^3 and n^2 to pass, and this will allow the pinion k^4 and the screw k^5 to make one revolution while the cylinder L makes a temporary stop. This operation will raise the block O^3, so that the arm thereof will pass over one of the lugs or projections O^6 and into position to engage with the music leaf or frame, or the disk k^6 and the cylinder L will be carried around about one-quarter of a revolution until stopped by the rod f^8, dropping into the notch m^6 of the disk k^6, where it will be held until released by the depression of one of the keys C^4.

The shaft R^3, by which the music-frames are supported, is detachable and may be mounted in the brackets R and R^2 in any desired manner, and in Figs. 12 and 13 the point or projection m^3 of the trip M is shown at the left-hand side, this position being that which said trip assumes in the actual operation of the device; but when the machine is stationary and not in operation the position of these parts will be reversed.

The back of the support a and a^2, by which the box or casing B is connected with the box or frame A, is provided with a clamp X, which may be used for any desired purpose, either in connecting the device with a support or for holding or clamping the music in connection therewith, and the object of the rod g^7, which projects through one end of the box or casing B, is to provide means for winding the drum G. This device may be secured to the body of a musical instrument in such manner that the base box or casing A will rest directly over and at the rear of the keyboard thereof in easy reach of the operator, and the music may be turned with comparatively slight inconvenience, the keys of the music-turner being in easy access, and this device may be connected with a piano or other musical instrument, or with a rack or other support, in any desired manner.

A part of the spring of the spring-drum G is shown at G^2 in Fig. 5, and I have also shown in said figure at G^3 a pin which is intended to prevent said spring from coming in contact with the disk or wheel k^6, and it will be apparent that many changes in and modifications of the construction of the device herein described may be made without departing from the spirit of my invention or sacrificing its advantages, and it will be apparent that the spring-drum G may be wound in any desired manner.

My improvement is also well adapted to accomplish the object for which it is intended; and,

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A music-leaf turner comprising a base box or casing, a supplemental box or casing mounted thereover, music-frames revolubly supported above said supplemental box or casing, a tubular and revoluble cylinder supported above said supplemental box or casing, and provided with a slot in one side thereof, and an extension which projects downwardly into said supplemental box or casing, a screw which passes upwardly through said extension and through said cylinder, and on which is mounted a block which is provided with an arm which projects through said slot, and which is adapted to operate in connection with

lugs or projections formed on said music-frames, substantially as shown and described.

2. In a music-turner, a base box or casing provided with two spring-operated shafts, each of which is provided with keys, a supplemental box or casing mounted above said base box or casing, a shaft mounted above said supplemental box or casing, and provided with music-supports which are revolubly mounted thereon, a revoluble cylinder mounted below said shaft and provided with an extension which projects into the supplemental box or casing, a screw which passes upwardly through said extension and through said cylinder, a movable block mounted on said screw and provided with an arm which projects through a vertical slot formed in said cylinder, a spring-drum mounted in said supplemental box or casing and operative devices connected with said parts whereby the music-supports may be turned by operating the shafts in the base box or casing, substantially as shown and described.

3. In a music-turner, a base box or casing, provided with two spring-operated shafts, each of which is provided with keys, a supplemental box or casing mounted above said box or casing, a shaft mounted above said supplemental box or casing, and provided with music-supports which are revolubly mounted thereon, a revoluble cylinder mounted below said shaft and provided with an extension which projects into the supplemental box or casing, a screw which passes upwardly through said extension and through said cylinder, a movable block mounted on said screw and provided with an arm which projects through a vertical slot formed in said cylinder, a spring-drum mounted in said supplemental box or casing, and operative devices connected with said parts whereby the music-holders may be turned by operating the shafts in the base box or casing, said supplemental box or casing being vertically adjustable, substantially as shown and described.

4. A music-turner comprising a base box or casing, spring-operated shafts mounted therein, each of which is provided with keys, a supplemental box or casing mounted above said base box or casing, and connected therewith, operative shafts connected with the shafts in the base box or casing, and projecting upwardly into said supplemental box or casing, a shaft supported above said supplemental box or casing and provided with music-supports which are revolubly mounted thereon, a revoluble cylinder mounted below said shaft, and provided with a slot in one side thereof, and an extension which projects downwardly into the supplemental box or casing, a screw which passes upwardly through said extension and through said cylinder, a block mounted on said screw within said cylinder and provided with an arm which projects through said slot and which is adapted to operate in connection with said music-supports, a spring-drum mounted in said supplemental box or casing, and operative devices whereby the music-holders may be operated by means of said spring-operated shafts, substantially as shown and described.

5. A music-leaf turner, comprising an oblong box or casing, spring-operated shafts mounted in said box or casing and provided with keys, a supplemental box or casing supported above said box or casing, operating-shafts connected with the shafts in the base box or casing, and extending upwardly into the supplemental box or casing, a spring-drum mounted in said supplemental box or casing, music-frames revolubly supported above said supplemental box or casing, a cylinder revolubly supported above said supplemental box or casing, and provided with an extension which projects downwardly thereinto, a screw which projects upwardly through said extension, and through said cylinder, and provided with a block which is mounted thereon, on which is formed an arm which projects through a slot formed in said cylinder, said arm being adapted to operate in connection with lugs or projections formed on the music-frames, and operating devices whereby said operating-shafts may be manipulated so as to turn said music-frames in either direction, substantially as shown and described.

6. A music-leaf turner comprising a base box or casing, a supplemental box or casing mounted thereover, music-frames revolubly supported above said supplemental box or casing, a tubular and revoluble cylinder supported above said supplemental box or casing, and provided with a slot in one side thereof, and an extension which projects downwardly into said supplemental box or casing, a screw which passes upwardly through said extension, and through said cylinder, and on which is mounted a block which is provided with an arm which projects through said slot, and which is adapted to operate in connection with lugs or projections formed on said music-frames, a spring-drum mounted in said supplemental box or casing, and gearing connected with said drum, the extension of said cylinder, and adapted to be operated by spring-operated shafts mounted in the box or casing for turning said music-frames in either direction, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 9th day of April, 1897.

EMRA WEBSTER FUNK.

Witnesses:
FRED M. CORLISS,
MARTIN T. TALLEPSON.