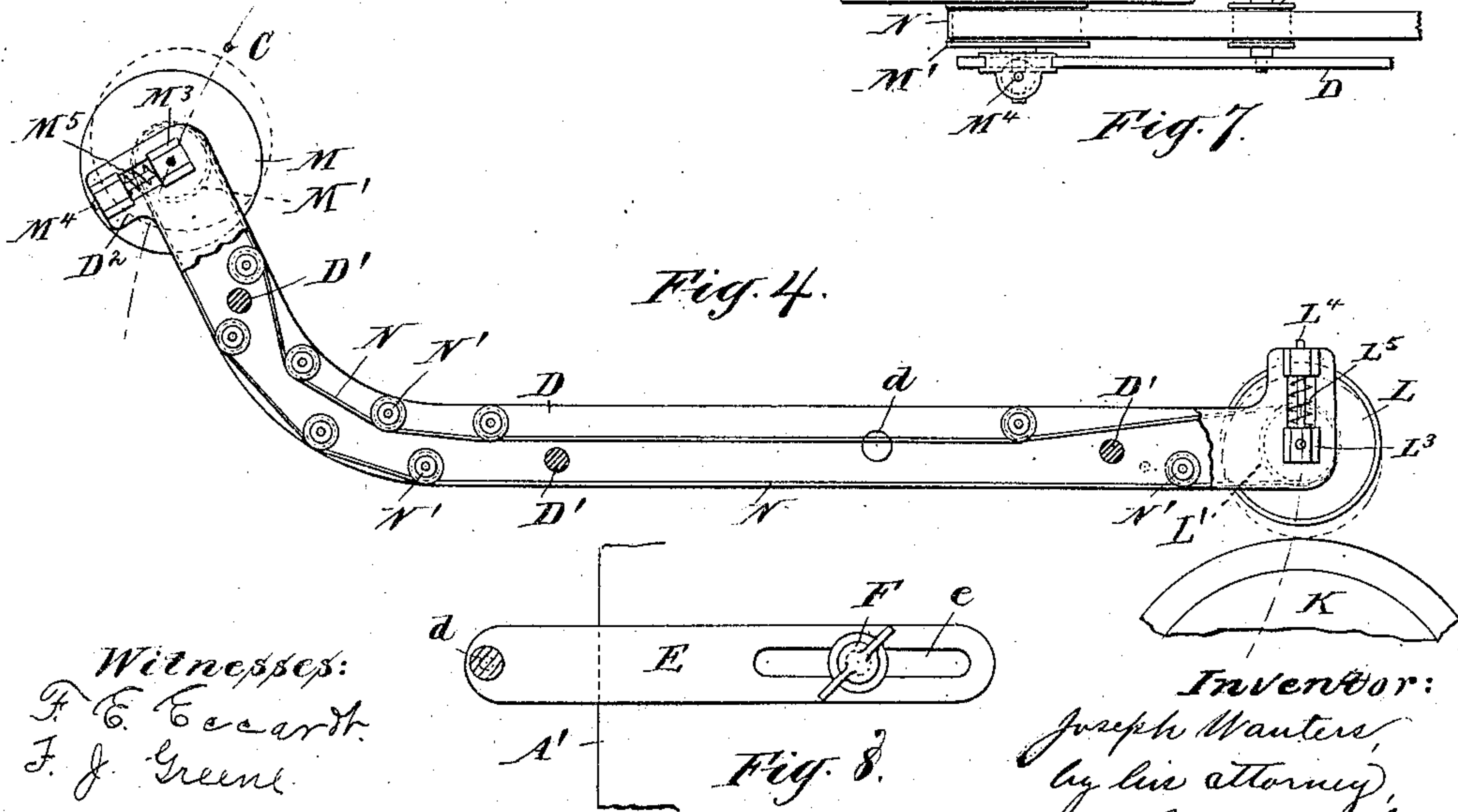
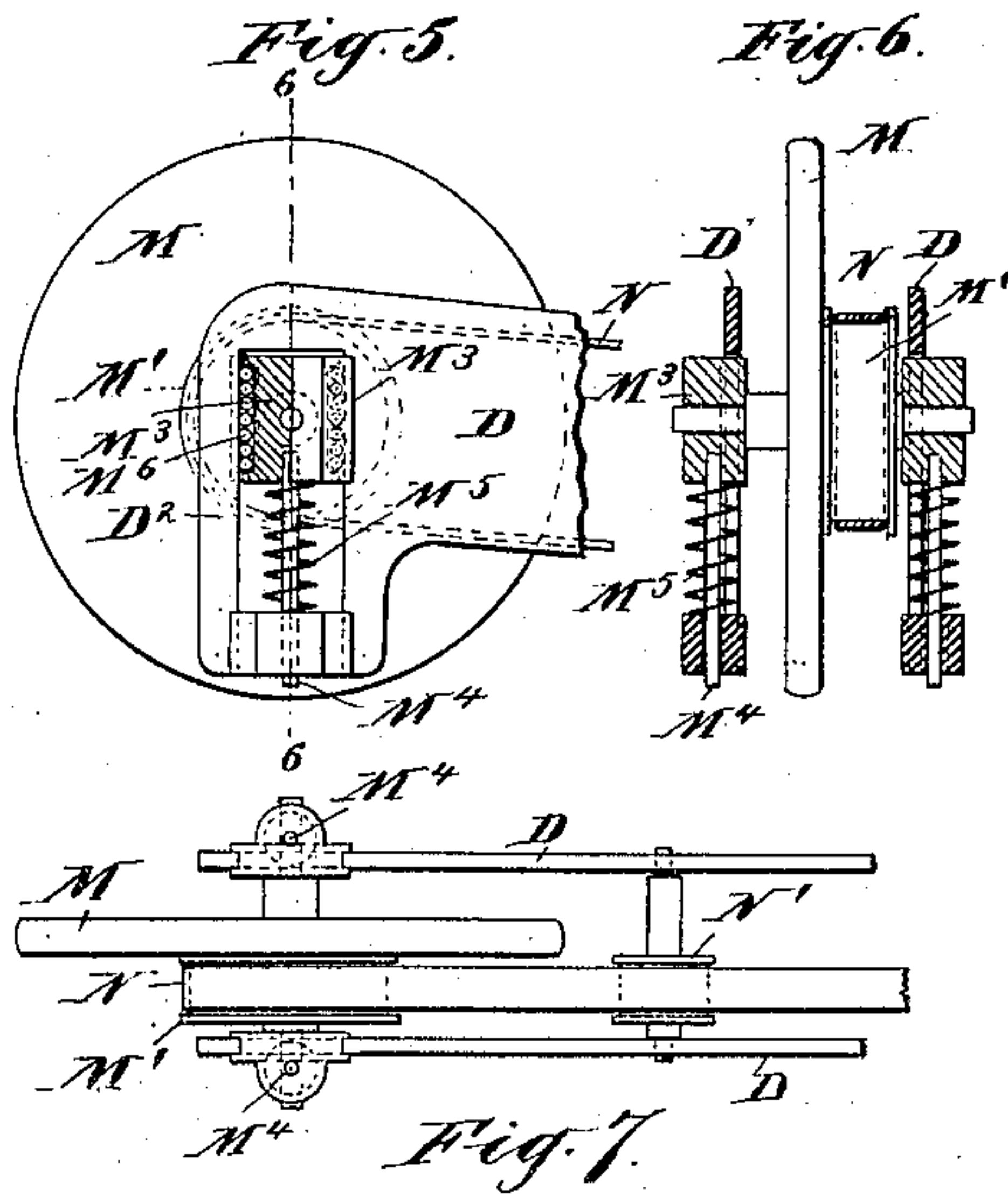
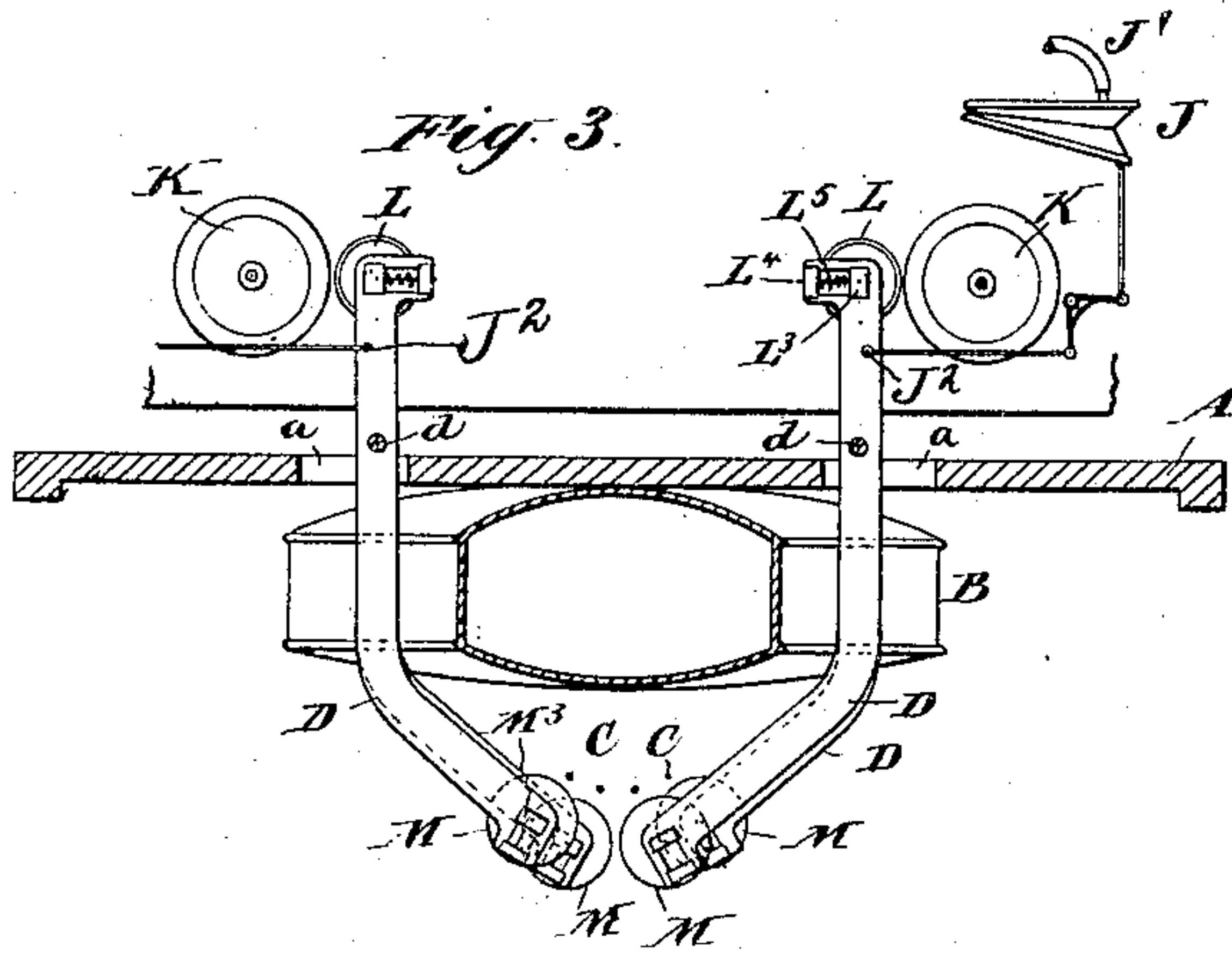
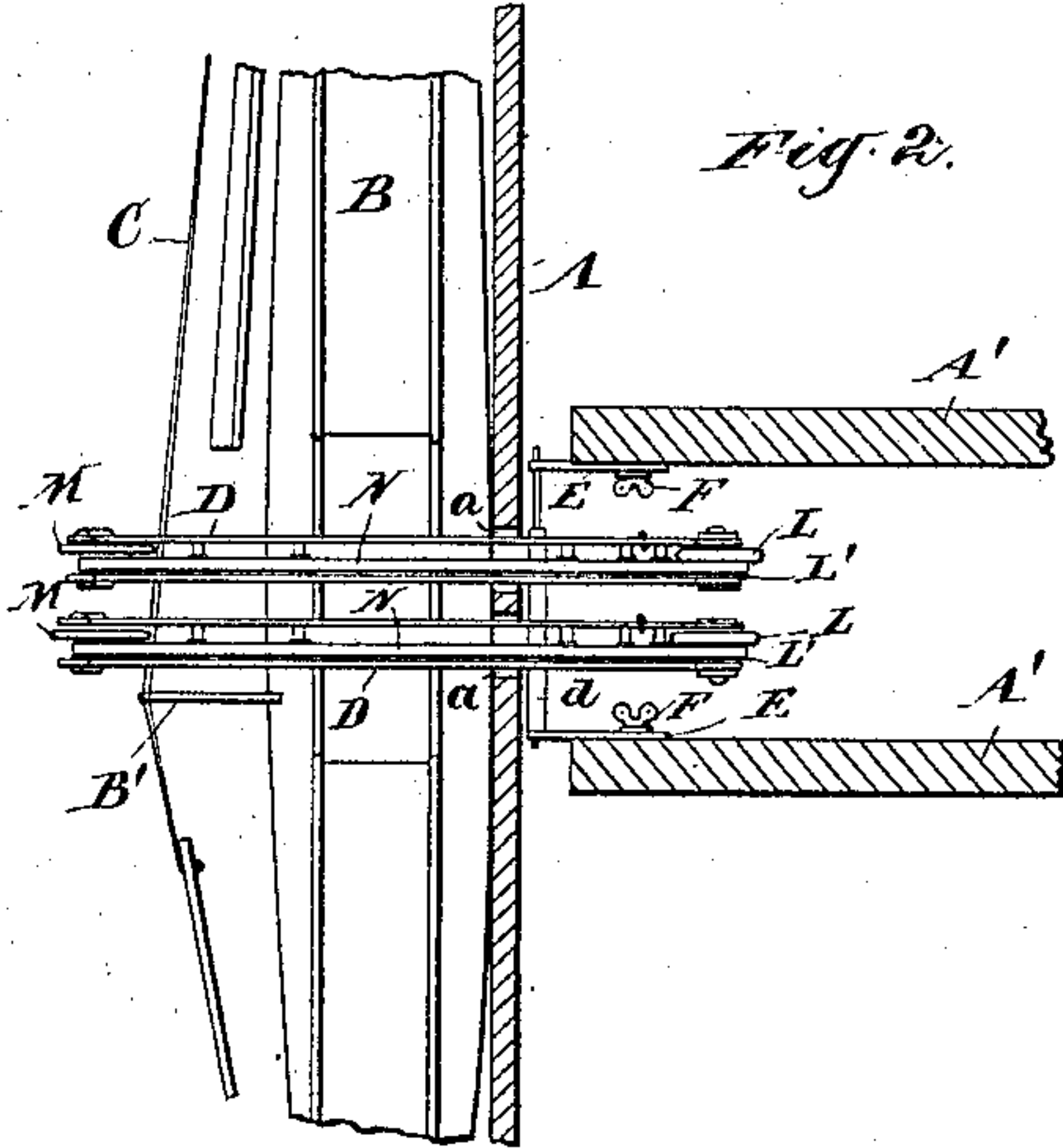
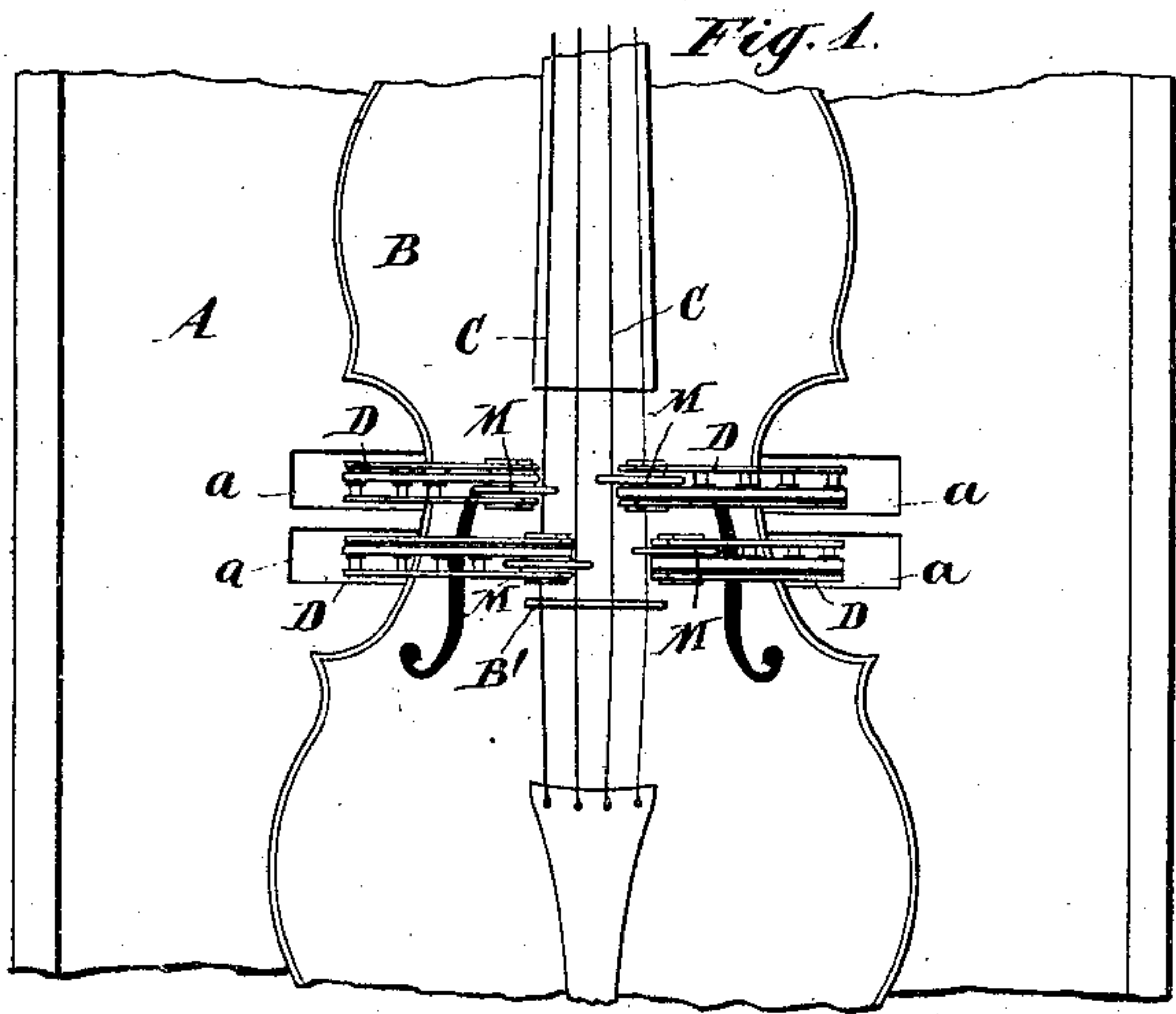


No. 846,883.

PATENTED MAR. 12, 1907.

J. WAUTERS.
AUTOMATIC VIOLIN PLAYER.

APPLICATION FILED MAR. 19, 1906.



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UNITED STATES PATENT OFFICE.

JOSEPH WAUTERS, OF NEW YORK, N. Y.

AUTOMATIC VIOLIN-PLAYER.

No. 846,883.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed March 19, 1906. Serial No. 306,717.

To all whom it may concern:

Be it known that I, JOSEPH WAUTERS, a subject of the King of Belgium, residing in the city of New York, borough of Manhattan, in the county and State of New York, have invented a certain new and useful Improvement in Automatic Violin-Players, of which the following is a specification.

The invention relates to mechanism for automatically producing musical compositions on instruments of the violin class, and more particularly to the bow or means for inducing the required vibrations of the strings.

The object of the invention is to provide a vibrator which will act on the string in a manner closely analogous to that of the usual bow and means for presenting such vibrator to the string with the required delicate yielding touch.

The invention consists in certain novel features, arrangements of parts, and details of construction by which the above objects are attained to be hereinafter described, and pointed out in the claims.

The accompanying drawings form a part of this specification and show an approved form of the invention.

Figure 1 is a front view of a portion of a violin and its support equipped with the invention. Fig. 2 is a vertical section through the support, showing a portion of the violin and vibrating means in elevation. Fig. 3 is a horizontal section through the support and violin, showing the vibrators and operating means in plan view. Fig. 4 is a plan view of one of the vibrators and its carrier alone, on a larger scale, certain portions being broken away to show the interior mechanism. Fig. 5 is a plan view, partly in horizontal section on a still larger scale, showing the vibrator and means for mounting it in its carrier. Fig. 6 is a corresponding section on the line 6 6 in Fig. 5, certain portions being shown in elevation. Fig. 7 is an elevation corresponding to Fig. 5. Fig. 8 is a plan view showing an adjustable support for the vibrator-carrier.

Similar letters of reference indicate the same parts in all the figures.

The invention is based on the discovery that glass possesses in a marked degree the qualities required in a vibrator, and this discovery has been applied in the present instance in the form of a rotating wheel or disk

arranged to contact at the periphery with the violin-string.

A is a board, preferably arranged vertically in a supporting frame or case, and B is a violin held thereon by any suitable means. The violin may be in all respects as usual, having strings C stretched over a bridge B'.

Through openings *a a* in the sounding-board extend from the rear four carriers or levers D D, one for each string; each consisting of two metallic bars separated by studs D' D' and carrying at the outer end a disk M, of glass, preferably what is known as "crystal" or good-quality flint glass, mounted to rotate therein with its periphery projecting beyond the arm next the string and constituting a vibrator. The carriers or arms are pivoted at *d* in rear of the sounding-board to swing horizontally, two on each side of the violin, the pairs thus formed each mounted on one pivot and curved to present their disks in horizontal positions to the several strings C.

At the inner end of each arm is a friction-wheel L, which may be of metal with a peripheral tread of rubber, and on the shaft of the wheel L is a pulley L', corresponding to a similar pulley M' on the shaft of the disk M. A belt N traverses the pulleys and is caused to follow the bent form of the arm by idle rollers N', pivotally mounted in the arm.

Closely adjacent to each friction-wheel L and in the same plane therewith is a rubber-faced driving-wheel K, which may be understood to be continuously revolved by any suitable motor, (not represented,) and J is a bellows or "pneumatic," controlled, as usual, by a perforated music-roll (not shown) or by other means through a tube J' and connected to the arm D at J², so that the movement of the pneumatic will swing the arm and cause the friction-wheel L to contact with the driver K, and thus through the belt N rotate the disk M. This movement of the arm also causes the disk to approach its string C. The shaft of the disk M, with its pulley M', has its bearings in blocks M³ M³, arranged to move in ways D² in the bars forming the lever, guided by pins M⁴ and subject to the force of slight helical springs M⁵, tending to force the disk in the direction of the string against which it acts and arrested by the contact of the blocks M³ with the ends of the ways. The friction-wheel L is similarly mounted in blocks L³, having pins L⁴ and

springs L⁵, forcing the friction-wheel toward the driver K. Antifriction-balls, as at M⁶, are introduced between the blocks and ways to reduce the friction. Thus arranged
 5 the friction-wheel is yieldingly presented to the driver and the disk makes a soft yielding contact with the string.

The outer portions of the arms differ in length, two being longer to reach the inner
 10 strings, and the others shorter for contact with the outer strings, one long and one short arm being placed in approximately the same plane above and one short and one long arm below to permit contact with the strings
 15 without interference, while allowing the four vibrators to be located compactly immediately adjacent to the violin-bridge. To insure that the disk shall be in rotation at the time of contact with the string, the arms are so
 20 proportioned relatively to the pivot d, driver K, and string C that the action of the pneumatic will cause the friction-wheel first to contact with the driver and establish the rotatory movement and an instant later swing
 25 the disk against the string, as indicated in Fig. 4. To facilitate this adjustment, the pivots d of the arms are mounted in plates E on transverse braces A' in the casing and secured thereto by screws F extending through
 30 slots e in the plates, whereby the latter may be moved as found necessary and securely clamped in position. The periphery of the disk is slightly rounded, as shown, and is preferably not polished, but has a mat surface approximating that of smoothly-ground
 35 glass. Thus conditioned the periphery will readily receive resin and hold it for long periods. I prefer to use fine-quality flint or crystal glass for the disks. My experiments indicate that the sonorous or vibrant characteristics of such glass render it best adapted for the purpose and will produce musical tones and effects with a violin-string rivaling or surpassing those produced by the hair bow.
 40 The apparatus requires no alteration in the violin, and by disconnecting the pneumatics from the arm the latter may be swung outwardly in the openings a sufficiently to permit the removal of the violin. The yielding
 45 quality of the disk-mountings serves an important function in absorbing the minute vibrations due to the driving mechanism and prevents their transmission to the string.

Although I have described the invention
 55 as applied to a violin, it will be understood that it will serve with any instrument of the violin class or in which a string is vibrated by a bow.

Modifications may be made in the sizes and
 60 proportions of the disks and other portions of the apparatus and in the means for mounting, rotating, and presenting the disk to the string with the required delicacy.

The motor for operating the driving-
 65 wheels, the mechanism from a music-roll to

the pneumatics, and other portions of the apparatus not illustrated may be of any approved construction, and the fingering may be produced and controlled by any suitable means.

I claim—

1. A violin-player having a vibrator for a string thereof, said vibrator consisting of a disk of glass, means for rotating said disk and means for bringing the moving periphery of said disk into contact with such string. 70
2. A violin-player having a vibrator for a string thereof, said vibrator consisting of a rotatable disk of flint glass, and means for bringing the moving periphery of said disk into temporary contact with such string. 75
3. A violin-player having a vibrator for a string thereof, said vibrator consisting of a rotatable disk of flint glass having a smoothly-ground or mat operating-surface, and means for bringing the moving periphery of said disk into temporary contact with such string. 80
4. A violin-player having a vibrator for a string thereof, said vibrator consisting of a disk of glass having its periphery ground to produce a mat surface, means for rotating said disk, a vibratory lever carrying said disk, and means connected with said lever for causing temporary contact of the moving periphery of said disk with such string. 85
5. A violin, a board, a vibratory lever, a revoluble disk carried by said lever upon one side of said board to act against a string of the violin, and means mounted to act upon said lever upon the opposite side of said board. 90
6. A violin, a board, a vibratory lever, a revoluble disk carried by said lever upon one side of said board to act against a string of the violin, means mounted to act upon said lever upon the opposite side of said board, and means on said lever for imparting rotary motion to said disk. 95
7. A lever fulcrumed between its ends, a disk carried at one end of said lever, a friction-wheel at the other end of said lever, means supplemental to and mounted on said lever for transmitting motion from said friction-wheel to said disk to rotate the latter, a friction driving-wheel, and means for moving said lever to cause frictional contact of said friction-wheel with said driving-wheel. 100
8. A lever fulcrumed between its ends, a disk rotatably mounted therein, a friction-wheel rotatably mounted in said lever, means supplemental to and mounted on said lever for transmitting motion from said friction-wheel to said disk, a friction driving-wheel, means for moving said lever to cause contact of said friction-wheel with said driving-wheel, and for moving said disk into contact with a relatively fixed violin-string. 105
9. A lever, a disk rotatably mounted therein, a friction-wheel rotatably mounted 110

in yielding bearings in said lever, means for transmitting motion from said friction-wheel to said disk, a friction driving-wheel, means for moving said lever to cause contact of said friction-wheel with said driving-wheel, and for continuing the movement of said lever to cause later contact of said disk with a violin-string.

10. A pivotally-mounted lever, a disk rotatably mounted in one end thereof, a pulley for said disk, a friction-wheel rotatably mounted in the other end of said lever, a pulley for said friction-wheel, a belt running on said pulleys, a friction driving-wheel, a pneumatic and connections therefrom to said arm, constructed to swing said lever and cause said friction-wheel to contact with said driving-wheel and said disk to contact with a violin-string.

11. A violin-player having a lever, a revolvable disk mounted therein for temporary engagement with a string of a violin, and a

yielding mounting for said disk, to provide yielding contact between the disk and string.

12. In a violin-player, a board, a violin mounted thereon, levers pivotally mounted in rear of said board and extending there-through, revolving disks carried in the outer ends of said levers, friction-wheels in the inner ends of said levers, means for transmitting motion from said friction-wheels to said disks, friction driving-wheels located adjacent to said friction-wheels, and pneumatics connected to said levers to swing the latter to cause contact of said friction-wheels with said driving-wheels and contact of said disks with the strings of a violin.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

JOSEPH WAUTERS.

Witnesses:

CHAS. A. HAUCK,
CHARLES R. SEARLE.