(No Model.) 4 Sheets—Sheet 1.

A. WIRSCHING.

PRINTING TELEGRAPH.

No. 265,353. Patented Oct. 3, 1882.

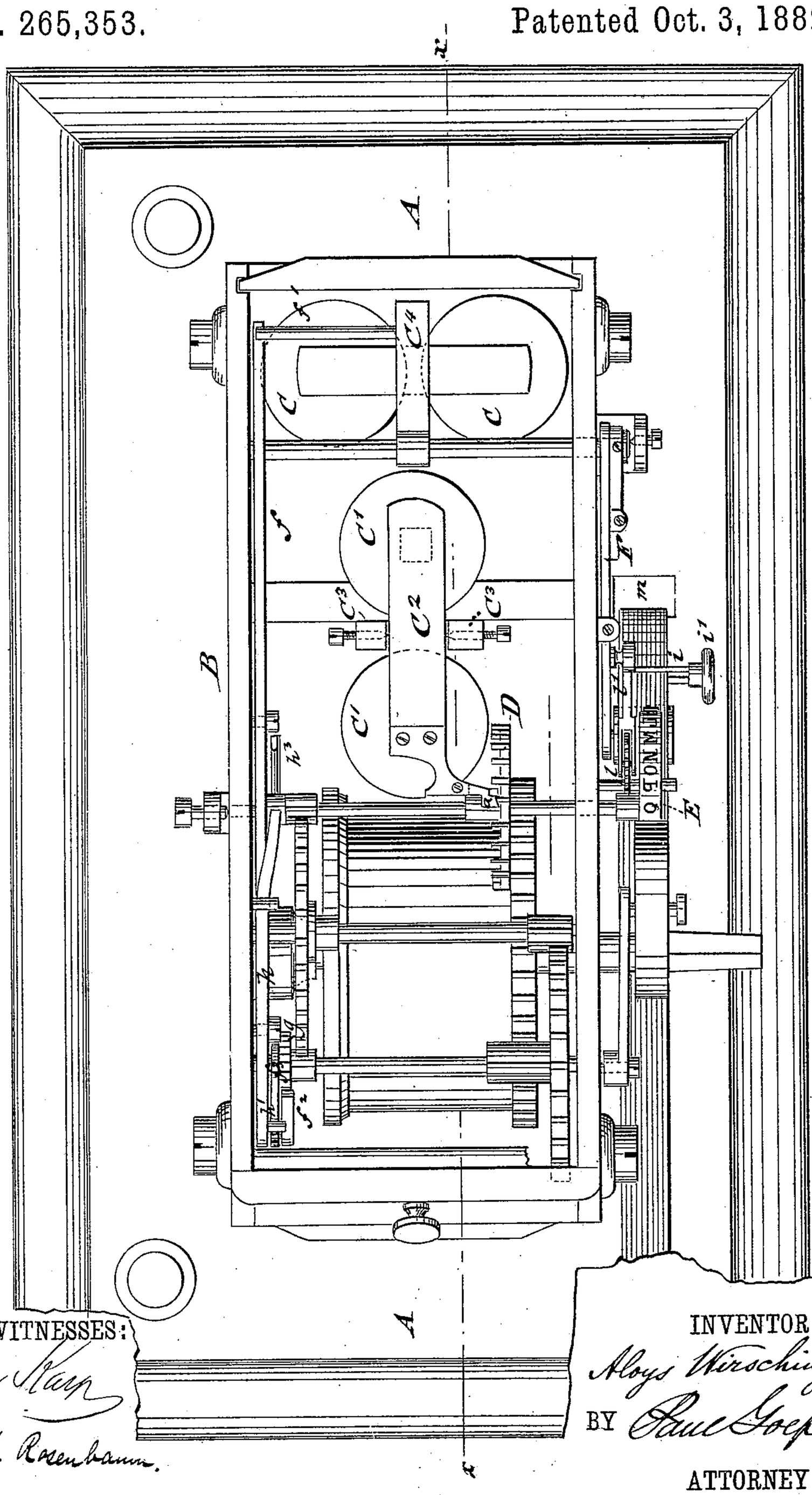

Fig. 1.

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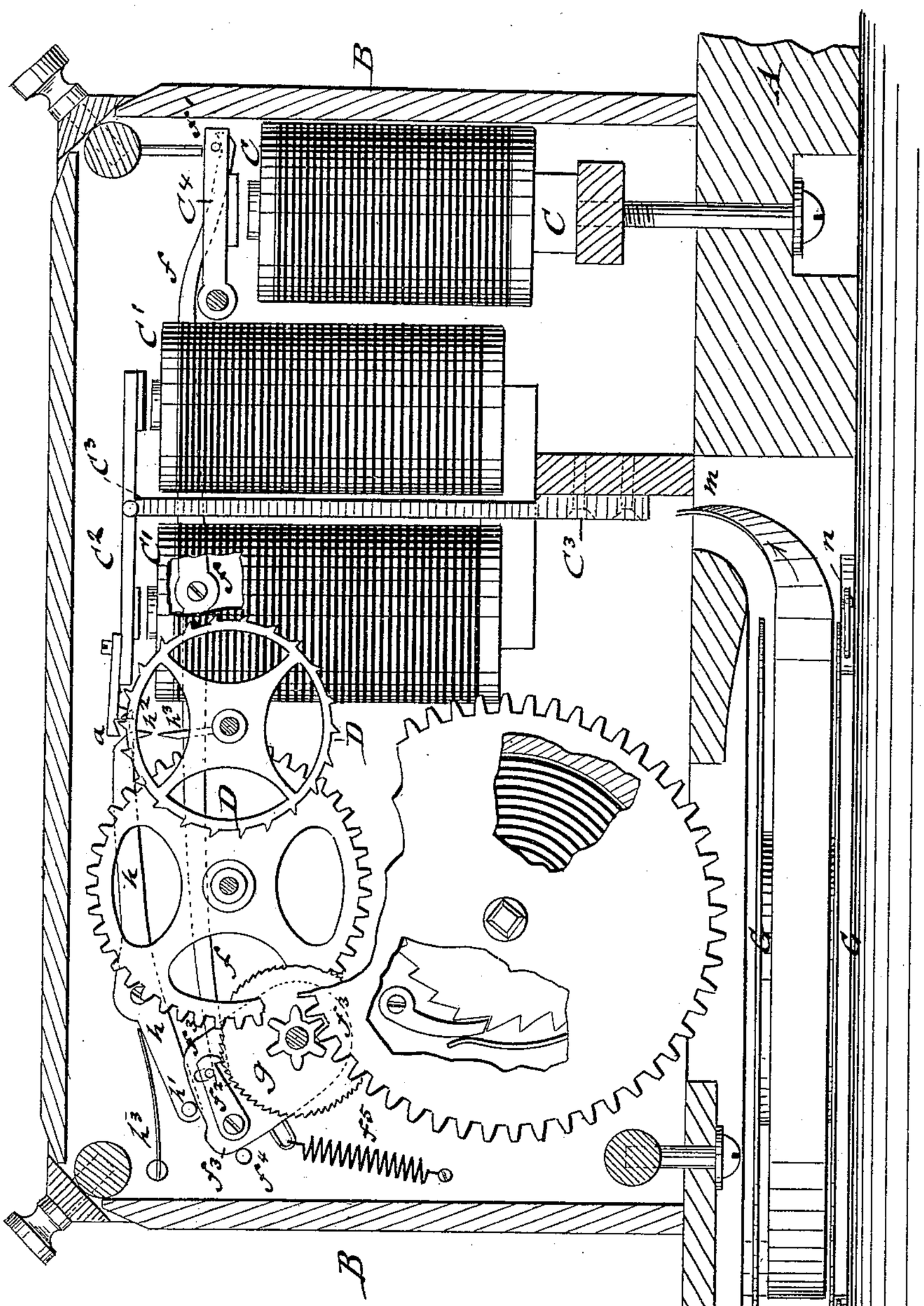
(No Model.) 4 Sheets—Sheet 2.

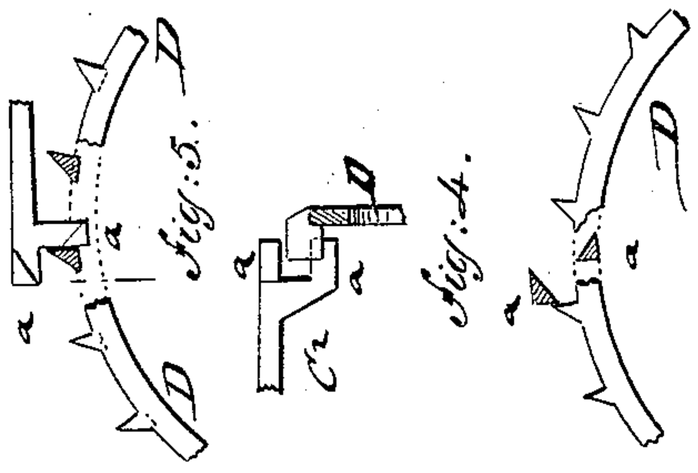
A. WIRSCHING.

PRINTING TELEGRAPH.

No. 265,353. Patented Oct. 3, 1882.

Fig. 2.





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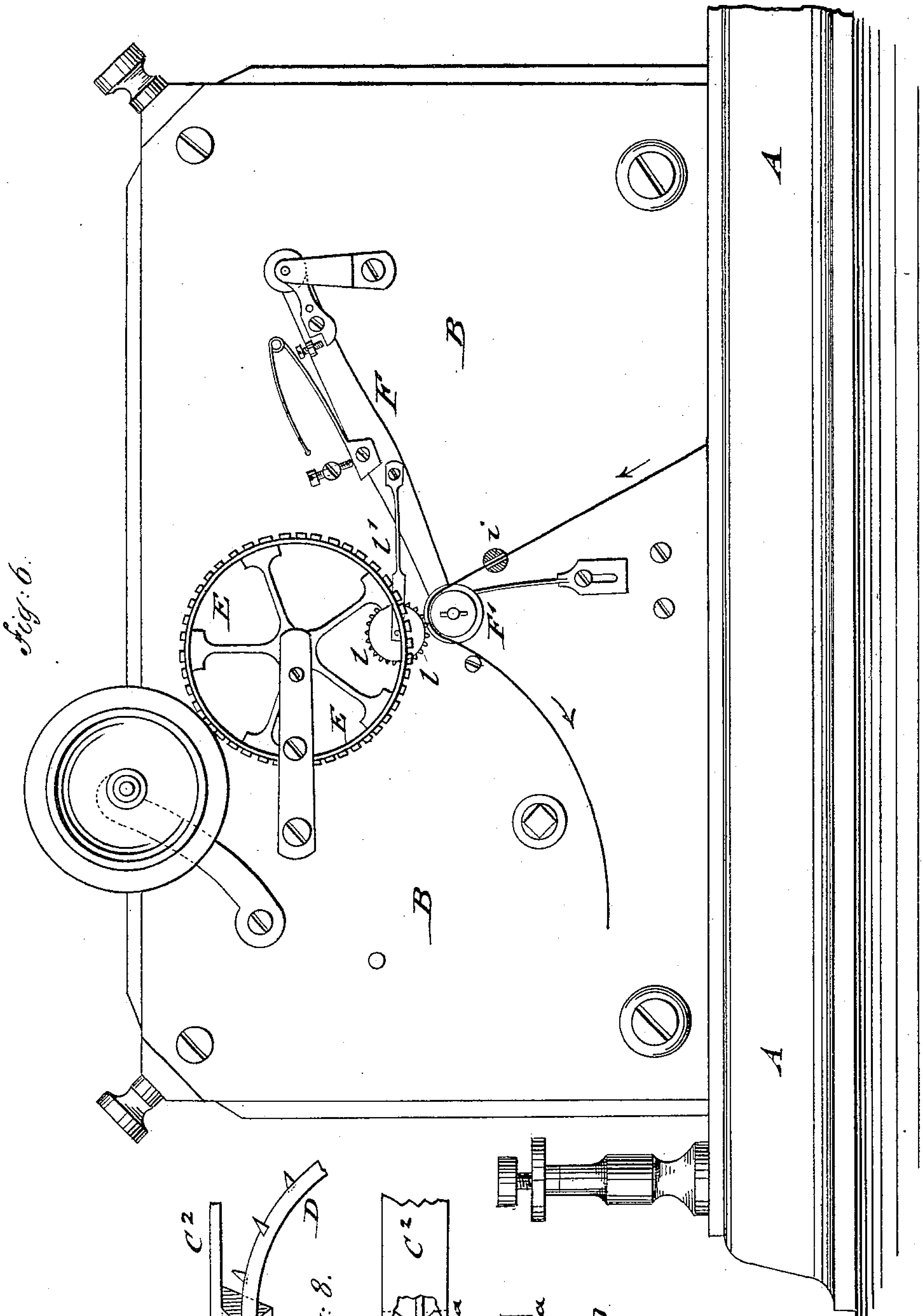
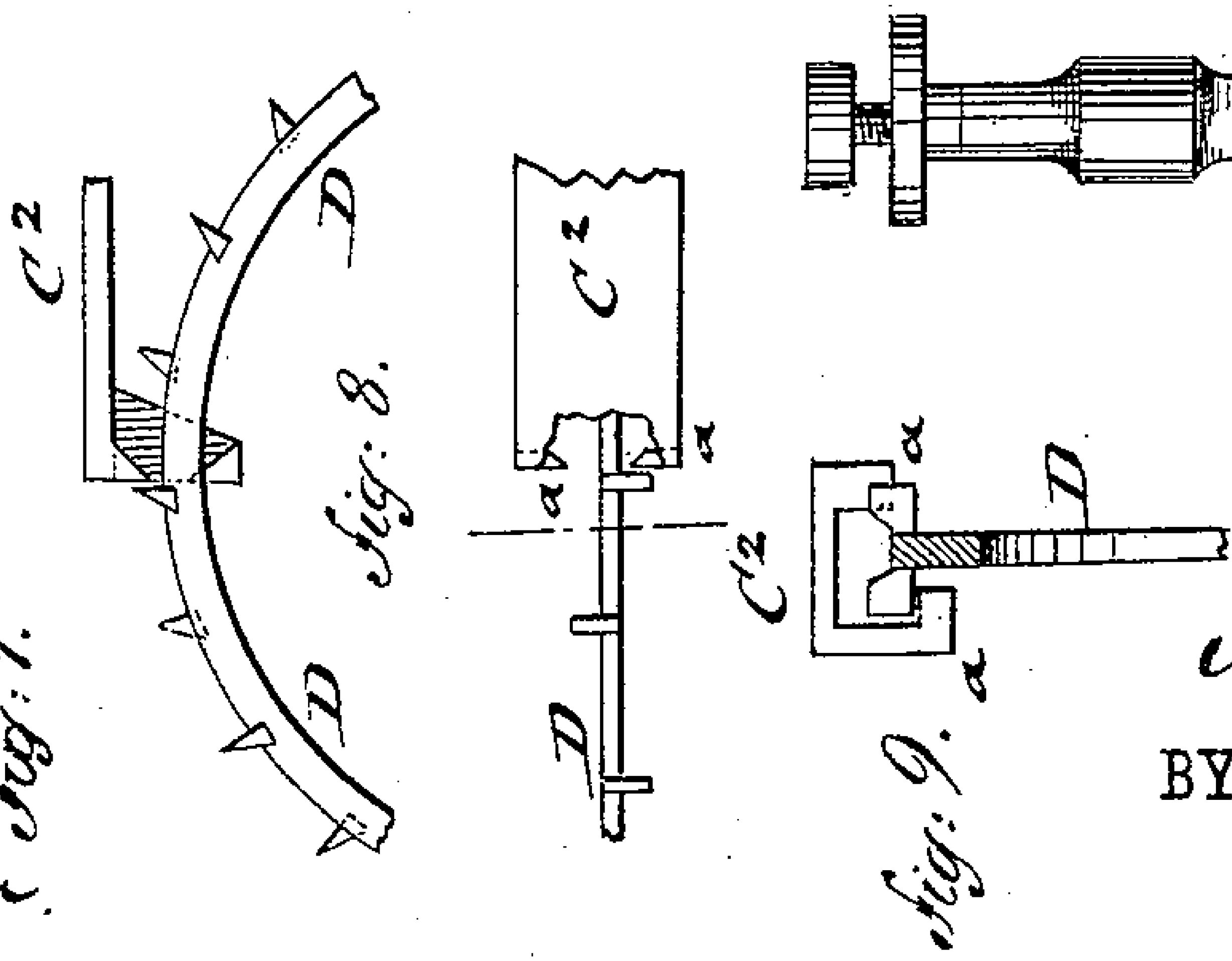
(No Model.) 4 Sheets—Sheet 3.

A. WIRSCHING.

PRINTING TELEGRAPH.

No. 265,353. Patented Oct. 3, 1882.





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(No Model.) 4 Sheets—Sheet 4.

A. WIRSCHING.

PRINTING TELEGRAPH.

No. 265,353. Patented Oct. 3, 1882.

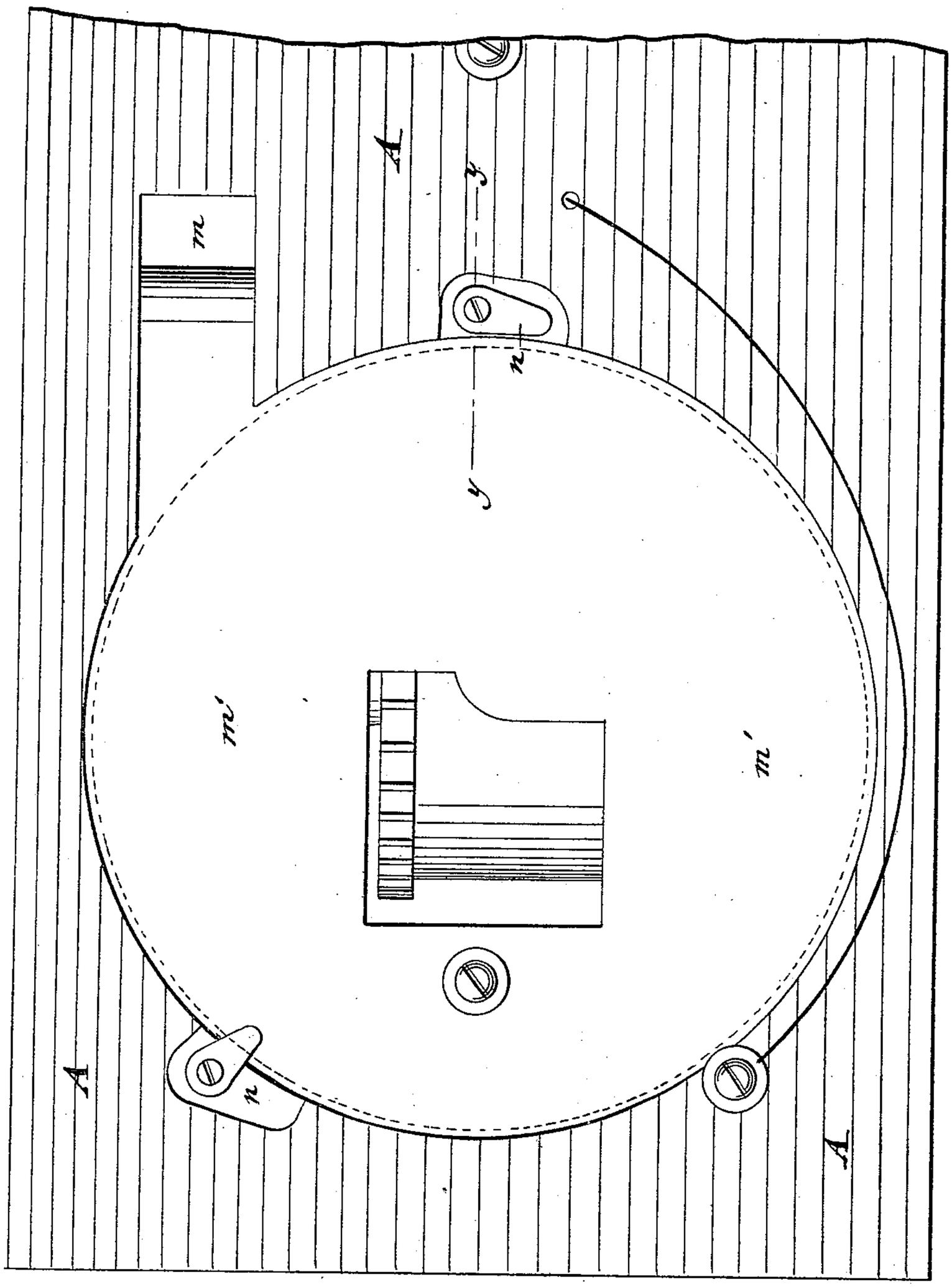

Fig. 1.

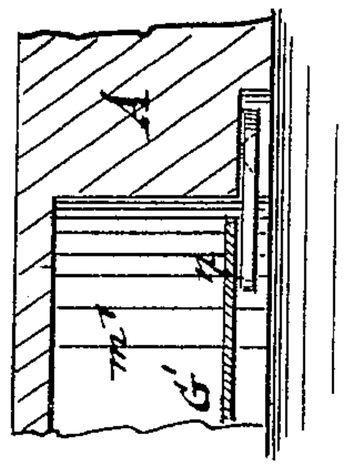

Fig. 11.

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UNITED STATES PATENT OFFICE.

ALOYS WIRSCHING, OF BROOKLYN, NEW YORK.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 265,353, dated October 3, 1882.

Application filed November 26, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALOYS WIRSCHING, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Printing-Telegraph Instruments, of which the following is a specification.

The main object of this invention is to produce a rapid and reliable printing-telegraph instrument for telegraphing or reporting stock-exchange quotations and transactions and for other purposes. The instrument is placed in circuit with a number of similar instruments and operated by a transmitter, being of any suitable construction, and provided with current-reversing mechanism and keys corresponding to the characters on the type-wheel of the receiving or printing instrument.

The invention consists, first, of a vertically-oscillating horizontal armature of the escapement-magnet, which armature engages by its tongues or pallets the sidewise-projecting teeth of the escapement-wheel, the armature being centrally pivoted and balanced upon a forked vertical steel magnet intermediately between the coils of the escapement-magnet.

The invention consists, secondly, of the combination, with a printing electro-magnet, of a unison-lever operated thereby, which engages by its opposite end a gravity-pawl and releases it from the teeth of a ratchet-wheel of the actuating-train, the pawl being attached to an oscillating cam-plate, which is stopped in one direction by a fixed pin of the frame. The cam-plate is carried along by the pawl when the same is engaged by the teeth of the ratchet-wheel and raises one end of a fulcrumed and spring-pressed stop-lever, so that its opposite end is thrown into the path of a fixed arm on the shaft of the escapement-wheel, whereby the latter is stopped and the unison of the printing-instrument with the transmitting-instrument at the central station established.

In the drawings, Figure 1 represents a plan view of my improved telegraph printing-instrument. Fig. 2 is a vertical longitudinal section of the same on line *x x*, Fig. 1, with parts broken away. Figs. 3, 4, and 5 are detail views of a portion of the escapement-wheel and of the pallets of the horizontal armature. Fig. 6 is a side view of the printing-instrument. Figs. 7, 8, and 9 are detail views of a portion of a modified form of escapement-wheel and pallets; and Figs. 10 and 11 are a bottom view of the printer and a detail section on line *x x*, Fig. 10, through the base of the instrument, showing the retaining devices of the paper-reel.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents the base-plate, upon which the different parts of my improved telegraph printing-instrument are supported. To the base-plate is rigidly attached an oblong casing, B, the longer side walls of which are made of metal plates, while the shorter end walls, as well as the top of the same, are made of beveled glass plates, which are retained by transverse corner-pieces and set-screws, so as to make them easily detachable for getting at the interior of the printing-instrument. The casing B incloses the interior parts and protects them against dust. In the metallic side plates are arranged the bearings for the arbors or shafts of the actuating spring-drum of the transmitting gear-wheels, of the escapement-wheel, and of the printing and other levers. Within the casing B are supported, at one end thereof, in upright position, the printing electro-magnet C, and at the other end the actuating spring-drum and the train of transmitting gear-wheels by which rotary motion is imparted to the shaft of the escapement-wheel D.

Intermediately between the spring-drum and the printing electro-magnet C is arranged an electro-magnet, C′, the armature C^2 of which is centrally pivoted to conical pins of a forked permanently-magnetized steel post, C^3, that is attached intermediately between the coils of the electro-magnet C′ to a transverse piece of the casing B. The cores of the electro-magnet C′ are not provided with pole-shoes or enlargements, but are arranged to act directly upon the centrally pivoted and balanced armature C^2, by which the loss of time occurring in the charging and discharging of the enlarged pole ends in Siemens polarized magnets is done away with, and consequently a quicker and easier motion of the armature obtained. The armature C^2 is provided at that end adjoining the escapement-wheel D with tongue-shaped

ends or pallets *a*, by which the teeth of the escapement-wheel D are engaged, which teeth project at one side of the wheel, as shown in Figs. 3, 4, and 5, or at both sides, in which case they alternate with each other, as shown in Figs. 7, 8, and 9. The balanced armature C^2 becomes polarized by its permanent supporting steel magnet C^3, it assuming the polarity of the upper end of the same. The armature C^2 is caused to oscillate vertically on its pivots, being alternately attracted by one of the poles of the electro-magnet C′, which are so placed in the circuit of the transmitting-instrument that when one pole attracts the other repels the armature, owing to the alternating polarities imparted thereto by the reversing of the current in the transmitting-instrument. The advantage of imparting a vertically-oscillating motion of the armature C^2 is that the shaft of the escapement-wheel is fixed once for all in its bearings, and requires no lateral adjustment, as in the printing-instruments having laterally-vibrating armatures heretofore in use. The escapement-wheel D is consequently always ready to be engaged by the pallets of the escapement-armature. The oscillating armature C^2 is provided with two tapering pallets, *a*, which alternately take hold of the teeth of the escapement-wheel—the upper one when the armature is attracted at one end and the lower one when the armature is repelled at the same end. Owing to the rapid discharge of the magnetism in the poles of the escapement-magnet C′, to the change of the polarities in the same, as caused by the transmitting-instrument, and to the balancing of the armature, the interlocking of the pallets of the armature with the teeth of the escapement-wheel is accomplished very quickly, so that the printing-instrument can be worked at greater speed than instruments with laterally-vibrating armatures. The polarized armature C^2 and the escapement-wheel D control the motion of the shaft of the latter, so as to prevent it from rotating continuously, but to impart to the same a step-by-step motion, according as the current is reversed over the main line by the transmitting-instrument at the central station, as customary in printing-instruments of this class. The same step-by-step motion is imparted to the type-wheel E, which is arranged at the outer end of the shaft of the escapement-wheel outside of the casing B.

The printing electro-magnet C is placed in the same circuit with the escapement-magnet C′, and attracts, when charged, an armature, C^4, which works the printing-lever F and a unison-lever, *f*—one at the outside and the other at the inside of the casing B. Whenever the type-wheel E is stopped by the escapement mechanism the circuit is completed for a sufficient length of time through the coils of the printing electro-magnet C, so that the printing-lever is enabled to strike the type, after which the printing-circuit is again interrupted. The unison-lever *f* is engaged by a pin, *f′*, of the armature C^4 of the printing electro-magnet C, the unison-lever *f* being fulcrumed to the side wall of the casing B and extended backward. Its rear end engages a gravity-pawl, f^2, which is pivoted to a cam-plate, f^3. The cam-plate f^3 is placed loosely upon the shaft of one of the wheels of the clock-train and drawn backward against a fixed stop-pin, f^4, by a spiral spring, f^5, applied to the cam-plate and the side wall of the casing B as soon as the pawl f^2 is lifted clear of the teeth of a ratchet-wheel, *g*, that is keyed to the same shaft upon which the cam-plate f^3 is placed. The unison-lever *f* engages the pawl f^2 by means of a pin which projects through a slot of the cam-plate f^3, as shown clearly in Fig. 2. When the armature of the printing electro-magnet C has not been attracted for some time the ratchet-wheel *g* carries the pawl f^2, and thereby the cam-plate f^3, forward, so that the latter engages a pin, *h′*, at the rear end of a fulcrumed stop-lever, *h*, the hook-shaped opposite end, h^2, of which is thereby thrown downwardly into the path of a fixed radial arm, h^3, secured permanently to the shaft of the escapement-wheel D. Whenever the stop-lever *h* engages the arm h^3 the type-wheel is also locked at a given point, so as to bring it thereby into unison with the transmitting-instrument. The pin *h′* of the fulcrumed stop-lever *h* is kept in contact with the cam-plate f^3 by a spring, as shown clearly in Fig. 2.

The printing-lever F is keyed to the outer end of the shaft of the armature C^4 and there vibrated between adjustable contact-stops. It is provided with the usual printing-roller, F′, at the end, and with a ratchet and pawl for feeding the paper successively over the roller and exposing it properly to the action of the type-wheel.

The paper is guided in a split post, *i*, and retained by a nut, *i′*, screwed upon the threaded end of the split post, as shown in Fig. 1. The paper passes over the printing-roller, and is retained by a spurred or serrated feed-wheel, *l*, which turns in bearings at the front end of a spring-arm, *l′*, applied to the printing-lever. The paper is fed to the printing mechanism through a slot, *m*, of the base-plate A, the reel being placed into a detachable box or drawer, G, which is arranged in a circular recess, *m′*, in the base of the instrument, the bottom of the box being removable, so as to replace the reel from time to time when used up. The box G is retained in the recess *m′* of the base-plate by means of pivoted lugs *n* or other suitable locking devices, so that the reel of paper is confined within the box or drawer. This arrangement of the paper box in a storage-recess of the base of the instrument allows the instrument to be brought within a considerably-smaller space, as it does entirely away with the reel-stand and brings the paper-reel at the same time out of sight.

The printing-instrument operates in the same manner as other printing-instruments of the same class. The polarized armature is vibrated by the current-reversing mechanism of the transmitter, and imparts, in connection with

the clock-work, to the type-wheel, a step-by-step motion. Whenever a key is depressed in the transmitting-instrument, and thereby the motion of the transmitter interrupted for a moment, the magnet of the printing-lever becomes sufficiently charged to attract its armature and throw the printing-lever against the corresponding type upon the type-wheel. The unison mechanism is not thrown into action during the regular printing, as the locking-lever is not allowed to take hold of the radial arm on the shaft of the escapement-wheel by the successive action of the lifting-lever. Whenever the transmitter has been permitted to make three or four revolutions without halting to print the locking-lever will move far enough to take hold of the radial arm, and lock thereby the type-wheel. By depressing the unison-key the type-wheel is unlocked and moves then in harmony with the transmitter.

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

1. In a printing-telegraph instrument, the combination of an escapement-wheel having sidewise-projecting teeth with a vertically-oscillating polarized armature, fulcrumed centrally to a forked steel magnet, supported intermediately between the coils of the escapement electro-magnet, substantially as set forth.

2. In a printing-telegraph instrument, the combination of the printing electro-magnet C, its armature C^4, and the fulcrumed unison-lever f, operated thereby, with a gravity-pawl, f^2, oscillating cam-plate f^3, fulcrumed stop-lever $h\ h'\ h^2$, and fixed radial arm h^3 of the shaft of the escapement-wheel, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ALOYS WIRSCHING.

Witnesses:
PAUL GOEPEL,
CARL KARP.