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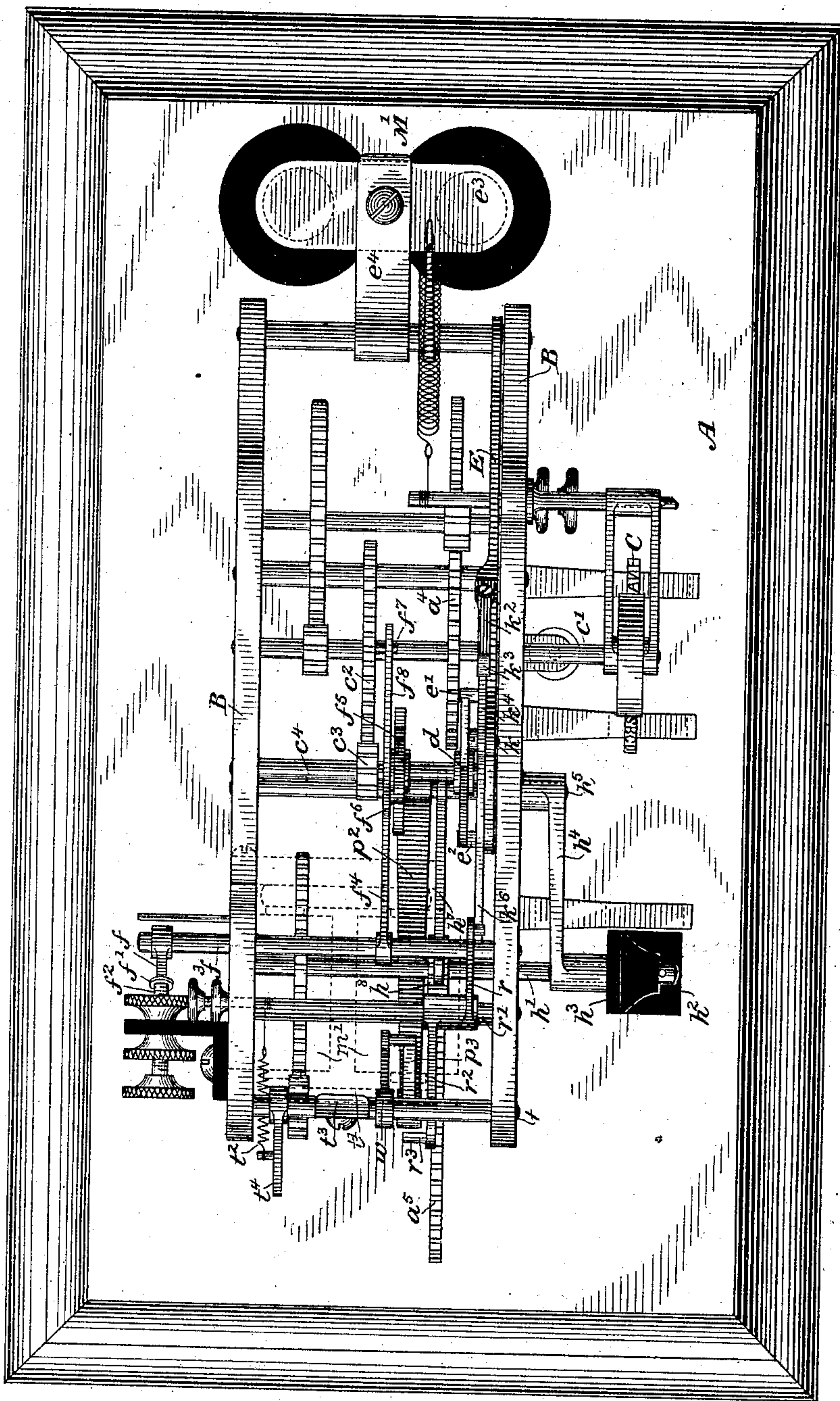
H. VAN HOEVENBERGH.
PRINTING TELEGRAPH.

4 Sheets—Sheet 1.

No. 316,677.

Patented Apr. 28, 1885.

Fig. 1.



WITNESSES

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(No Model.)

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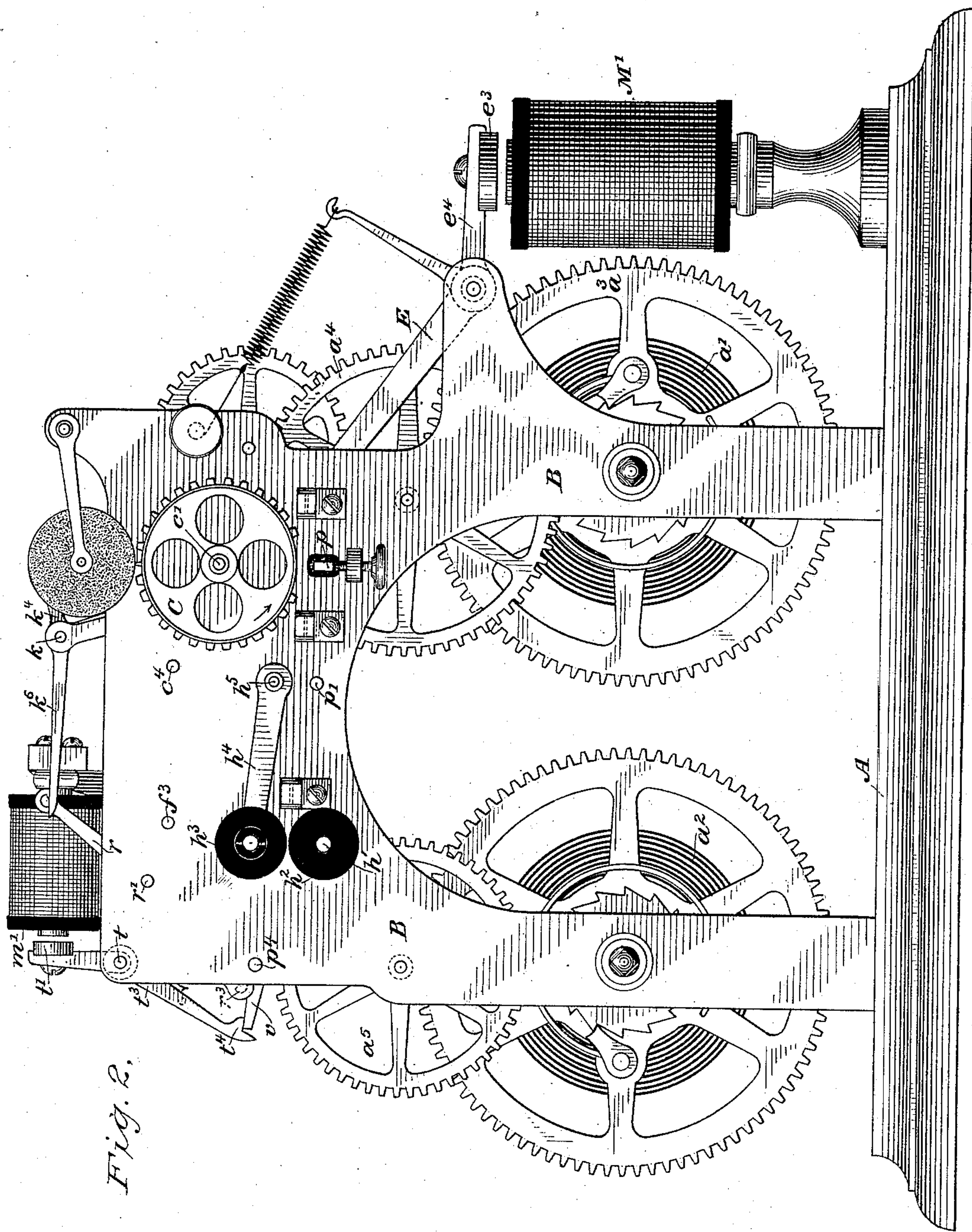


Fig. 2.

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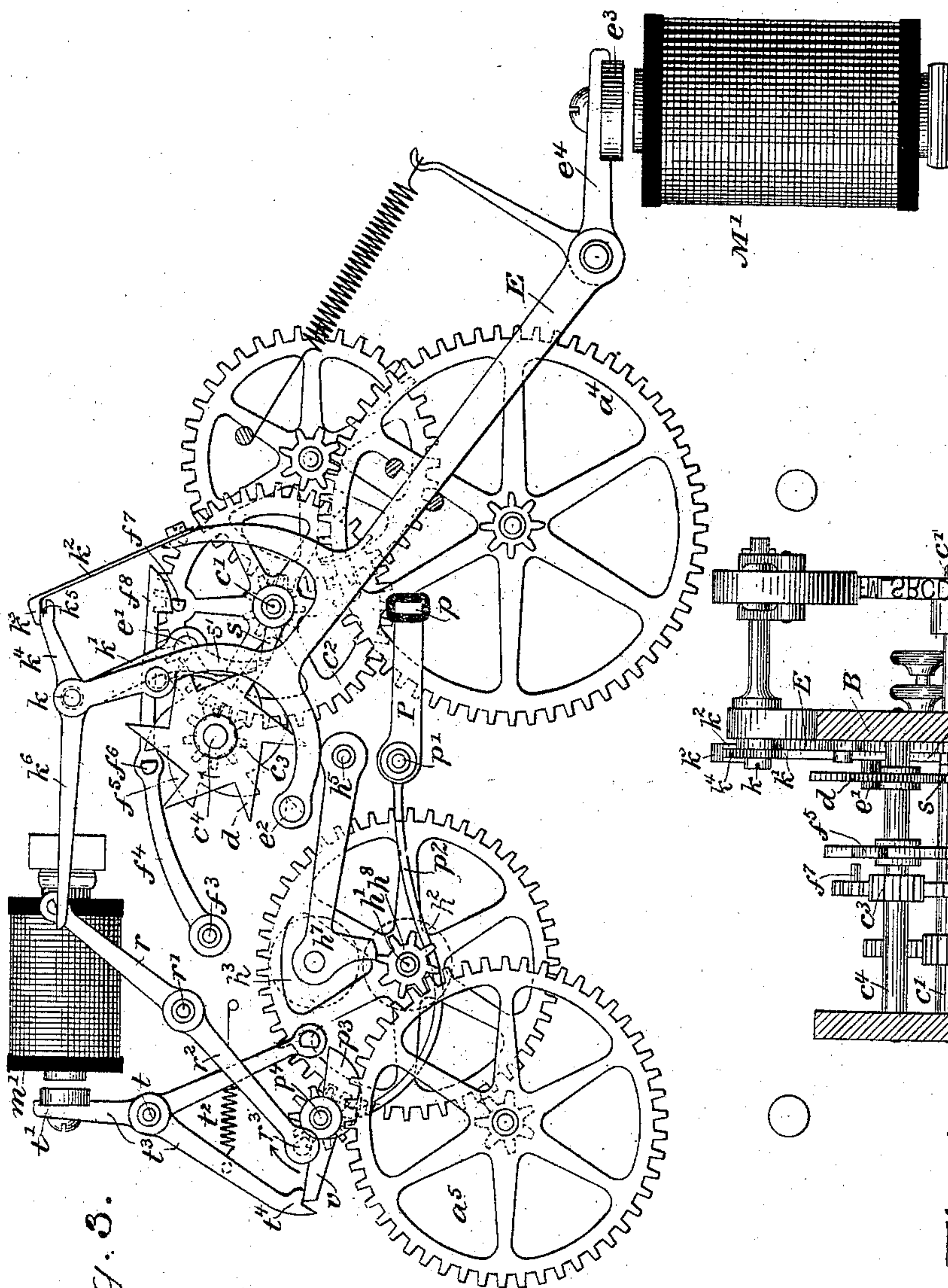


Fig. 3.

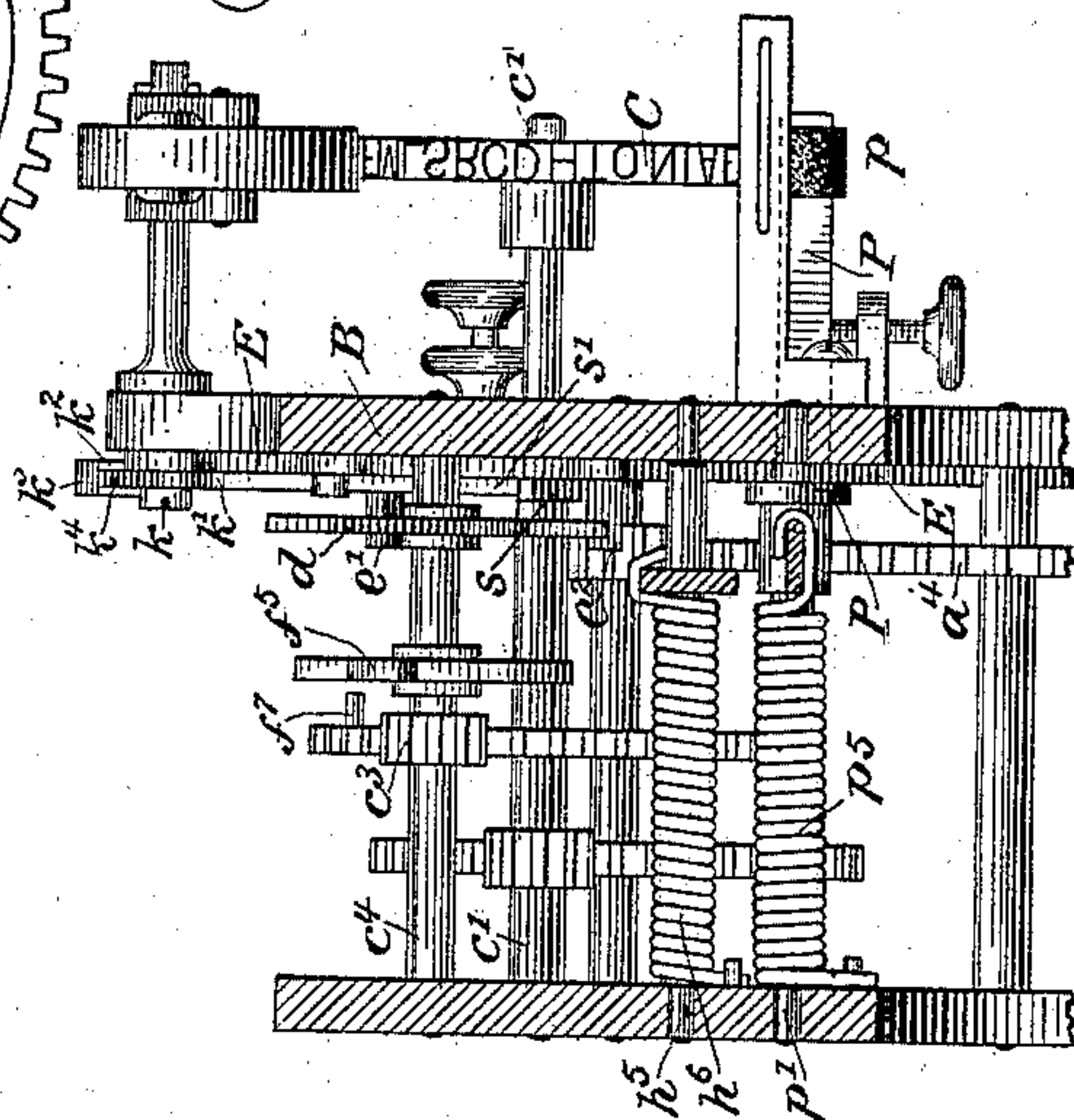


Fig. 4.

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4 Sheets—Sheet 4.

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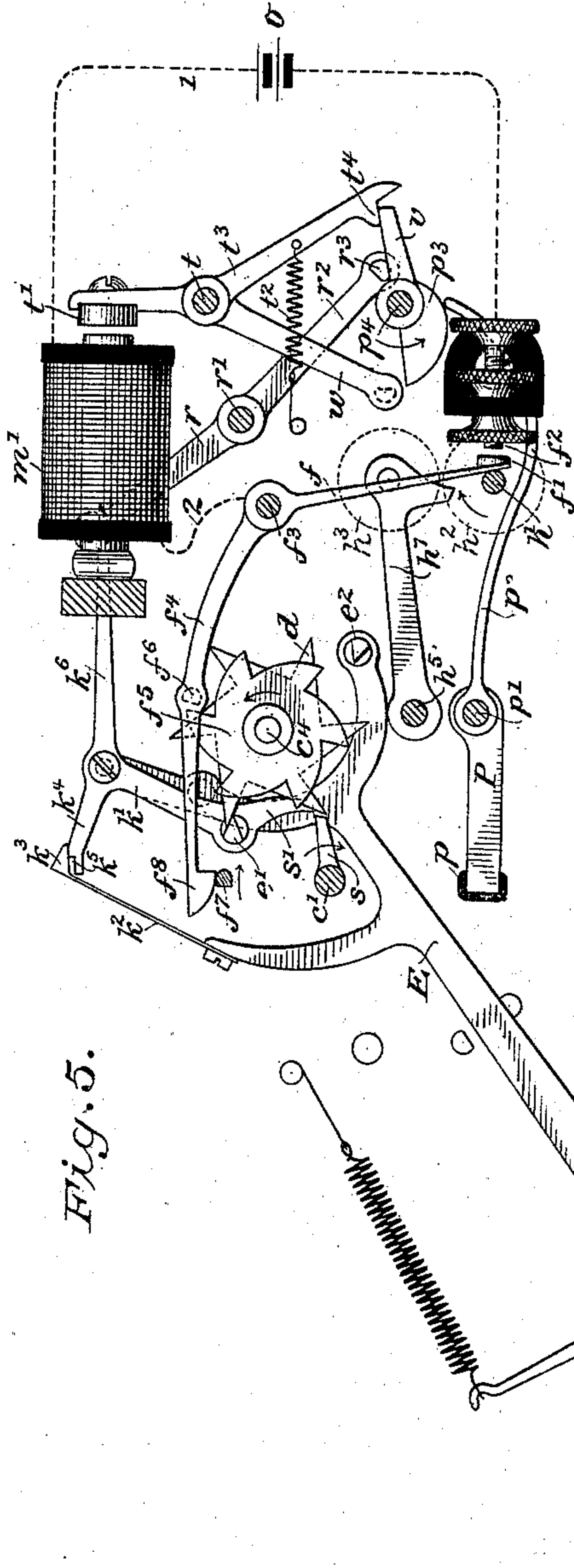


Fig. 5.

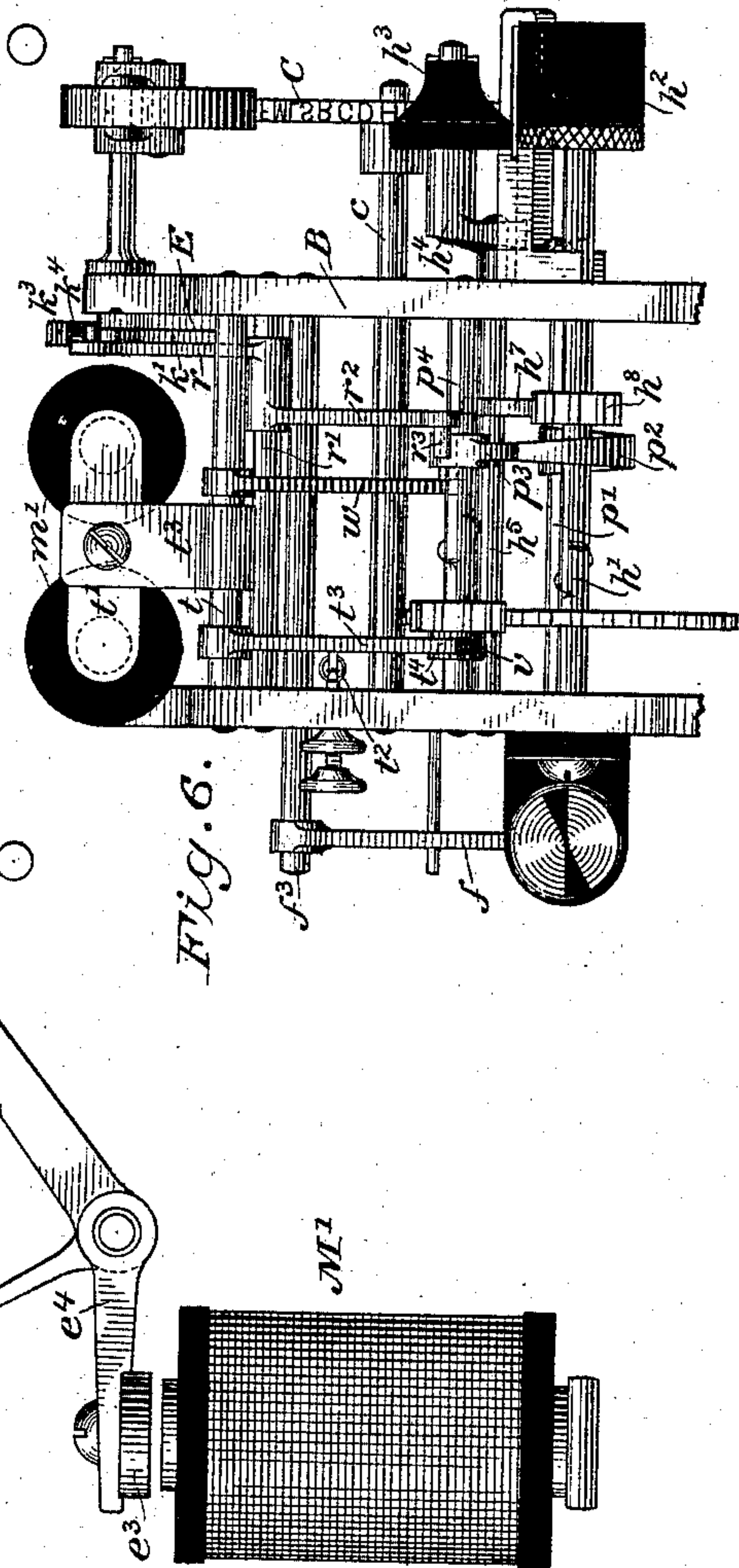


Fig. 6.

WITNESSES

Wm. A. Skink

UNITED STATES PATENT OFFICE.

HENRY VAN HOEVENBERGH, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO
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PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 316,677, dated April 28, 1885.

Application filed August 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY VAN HOEVENBERGH, a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Printing-Telegraph Instruments, of which the following is a specification.

My invention relates to the class of apparatus employed for telegraphically transmitting messages through the agency of electric impulses or currents, and effecting a record of the same from one or more type-wheels.

The object of the invention is to provide convenient and efficient means for advancing the type-wheels step by step, effecting impressions therefrom, and to insure that the type-wheels shall always be in unison with the transmitting apparatus.

The invention consists in organizing the apparatus in substantially the following manner: The type-wheel is carried upon a shaft which is automatically advanced through the agency of suitable clock-work. Applied to this shaft is an escapement-shaft carrying a scape-wheel. The scape-wheel is provided with an escapement-anchor, the movements of which are controlled by means of an electro-magnet responding to electric impulses transmitted over the main line. The scape-wheel is so organized that each complete vibration of the escapement-anchor permits a sufficient advancement of the type-wheel to bring a succeeding type above the printing-platen. The escapement-anchor is constructed with a rigid pallet carried upon the armature-lever of an electro-magnet and with a second pallet which is pivoted to the lever. The second pallet is normally pressed by a spring toward the other pallet, and is thus held in such a position that the two pallets engage the teeth of the wheel in the usual manner when the lever is vibrated. The arm carrying the second pallet extends into the path of a finger carried upon the lever of a second electro-magnet. When this second electro-magnet is vitalized, the pallet is thrown out of engagement with the scape-wheel, which is thereby permitted to revolve freely. The same device which releases the scape-wheel also releases a mechanism

organized to impel the printing-platen toward the type-wheel, and to thus cause an impression to be made. The impression is taken before the type-wheel commences to move, but immediately thereafter it revolves freely until it is automatically arrested at its unison-point through the agency of an arm or pin moving the type-wheel shaft, and serving to throw the pivoted pallet again into the path of and into engagement with the scape-wheel. The paper tape upon which the impressions are received is also automatically advanced through the agency of the second electro-magnet, but the feeding device is so constructed that the tape remains at rest during the time an impression is being taken. The second electro-magnet which thus controls the operation of printing, effecting the unison and feeding the paper, is included in a local circuit. The connections of the local circuit are interrupted so long as the type-wheel stands at its unison-point, and during the operation of the escapement-lever the contact-point, through which the local circuit is designed to be completed, is vibrated with such rapidity that the circuit-connections are not established a sufficient length of time to permit the electro-magnet to become vitalized. When, however, the escapement-lever is allowed to rest, any desired type having been caused to confront the platen, the local circuit will remain completed through the second electro-magnet, its armature will be actuated, and the movements above described will be effected.

In the accompanying drawings, which illustrate my invention, Figure 1 is a plan view of a complete instrument, and Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation of certain parts of the mechanism, the frame being removed. Fig. 4 is an end view of a portion of the mechanism, showing the type-wheel and escapement-shafts. Fig. 5 is a side elevation showing certain details in the organization of the scape-wheel-releasing and circuit-controlling devices, together with the local circuit-connections. Fig. 6 is an end view of a portion of the instrument, showing the organization of the paper-feeding devices.

Referring to the figures, A represents the base upon which the instrument is supported,

and B represents the frame of the instrument. In this frame are carried two coil-springs, a' a^2 , which are designed to respectively afford power for revolving the type-wheel C and for actuating the printing-platen and unison device. The spring a' operates through a wheel, a^3 , in the manner usually adopted in clock-movements to actuate a train of gear-wheels, a^4 , and thus to impel the type-wheel C in the direction indicated by the arrow. The type-wheel C is carried upon a shaft, c' , and this shaft is geared through a wheel, c^2 , and pinion c^3 , with an escapement-shaft, c^4 . The shaft c^4 is provided with a scape-wheel, d , which is engaged by the pallets e' and e^2 of an escapement-anchor, E. The escapement-anchor is applied to an armature, e^3 , carried upon a lever, e^4 , and this armature is in turn applied to an electro-magnet, M' , which is included in the main-line circuit and is designed to respond to electric impulses transmitted from the sending-station. Each time the electro-magnet M' is vitalized the escapement-anchor is moved so that the pallet e' releases the wheel d , but that wheel is immediately engaged by the pallet e^2 . When the magnet M' is demagnetized, the pallet e^2 releases the wheel and the pallet e' engages the succeeding tooth of the scape-wheel. The advancement of the scape-wheel d , which is thus occasioned, permits a sufficient revolution of the type-wheel to bring a succeeding type above the printing-platen p . In this manner, by vibrating the escapement-anchor E, any desired character upon the type-wheel may be brought into position to print.

For the purpose of effecting an impression of any character which has been thus caused to stand above the platen p , I employ an electro-magnet, m' , which is included in a local circuit, as is indicated in Fig. 5, by the conductors 1 and 2. The conductor 1 is connected from a battery, o' , with one terminal of the coils of the electro-magnet M' . The conductor 2 leads from the remaining terminal of these coils to an arm, f , which carries a contact-point, f' . The point f' is designed to rest in electrical connection with the point f^2 when it is desired to print, thereby completing the connections of the battery o' and causing the electro-magnet m' to be vitalized. For the purpose, however, of preventing the local circuit from being thus completed a sufficient time to vitalize the electro-magnet during the operation of bringing the desired type into position to print, the arm f is carried upon an arbor, f^3 , which also carries an arm, f^4 , extending into proximity to a toothed or cam wheel, f^5 . This wheel is mounted upon the shaft c^4 of the scape-wheel. Upon the arm f^4 is carried a pin, f^6 , which is designed to be engaged by the successive teeth of the cam wheel f^5 , and to be thrown upward thereby during the movement of the scape-wheel shaft. The upward movement of this arm serves to throw the pin f' away from the stop f^2 , there-

by preventing a continued contact during the advance movement of the type-wheel. The duration of the contact which is thus made is insufficient to permit the electro-magnet m' to become vitalized, and its armature t' will therefore not be actuated. When, however, the type-wheel is brought to rest with any one of its characters presented to the platen p , the circuit will remain closed and the electro-magnet will become vitalized. It will be obvious, however, that it is not desirable that the local circuit should be completed while the type-wheel is standing at its unison-point. For this reason a pin, f^7 , is carried upon the type-wheel shaft in such a position that it will engage an arm, f^8 , extending from the arm f^4 , when the type-wheel is at its unison-point, and thereby hold the point away from the stop f^2 . The first advancement of the type-wheel, however, will carry this pin out of engagement with the extension f^8 .

The operation of printing when the electro-magnet m' is allowed to be vitalized will now be described.

The printing-platen p is carried on a lever, P, and this lever is supported upon an arbor, p' . The arbor p' also carries an arm, p^2 , which extends beneath a cam, p^3 , carried upon an arbor, p^4 , of the train of gear a^5 , which is actuated by the spring a^2 . When the arbor p^4 is permitted to revolve in the direction indicated by the arrow, (see Fig. 3,) the cam p^3 throws the arm p^2 downward against the tension of a spring, p^5 , (see Fig. 4,) and causes the platen p to be thrown upward against the type-wheel. An impression will therefore be effected of the particular character which is presented to the platen.

For the purpose of advancing the paper tape beneath the type-wheel as may be required when the impressions are effected, I employ an arbor, h' , of a train, a^5 , which is actuated by the spring a^2 . This arbor revolves in the direction indicated by the arrow, Fig. 6. At the end of the arbor h' is carried a friction-wheel, h^2 , against which rests a similar wheel, h^3 . The paper tape is designed to be led from the type-wheel between these two rollers, and to be advanced by reason of the pressure exerted thereon when the lower roller, h^2 , is revolved. The roller h^3 is carried upon an arm, h^4 , which is supported upon an axis, h^5 . (See Fig. 4.) A spring, h^6 , surrounding this axis, serves to normally press the paper roller h^3 against the roller h^2 . For the purpose, however, of preventing the paper tape from being advanced at the moment an impression is being taken, I provide the following devices for raising the roller h^3 from the roller h^2 at the moment the platen p is impelled toward the type-wheel. This device consists of an arm, h^7 , extending from the axis h^5 , (see Fig. 6,) and resting upon a toothed wheel or pinion, h^8 , which is carried upon the arbor h' . The teeth of this pinion are caused to pass beneath the arm h^7 at the moment the

cam p^3 raises the platen p . The roller h^3 is thus lifted from the paper tape, and therefore, although the wheel h^2 be revolved, the tape will not be advanced. Immediately after an impression has been effected the roller h^3 is permitted to again fall against the paper tape, and to thereby cause it to be advanced. There will be therefore a slight forward movement of the paper immediately before an impression is taken. It will then stand at rest until the impression is effected, whereupon a further advancement will be occasioned.

The unison of the type-wheel is effected in the following manner: After each impression that is taken it is designed that the type-wheel shall be revolved to and automatically arrested at its unison-point. This is accomplished by causing the pallet e' to be automatically thrown out of engagement with the scape-wheel d without at the same time causing the pallet e^2 to be thrown into engagement with the wheel when the impression has been made. For this purpose the pallet e' is carried upon a pivoted arm, k' . A spring, k^2 , acting upon an arm, k^4 , normally holds the pallet e' toward the pallet e^2 , but permits of a sufficient movement of the same to cause it to release the wheel d , while the escapement-lever E remains in its lower position, as shown in Fig. 3. The spring k^2 is for this purpose carried upon the escapement-lever E , and at its extremity it carries a point, k^3 , which normally presses against one side of a right angle carried upon the arm k^4 . When, however, the arm k^4 is forcibly moved upward, the spring k^2 yields sufficiently to allow the point k^3 to pass the angle k^5 and to engage the other side of the angle, thereby retaining the pallet out of engagement with the wheel until it is again forcibly moved into its first position. For the purpose of thus forcibly throwing the pallet out of engagement with the scape-wheel d when an impression has been effected, an arm, r , extends from an arbor, r' , into such position as to engage an extension, k^6 , carried upon the arbor k of the arm k' . When the arm r is forced downward, it forces the pallet e' out of engagement with the wheel. The arm r is actuated by means of the cam p^3 , which is employed for effecting impressions immediately after the platen p has been actuated. For this purpose an arm, r^2 , extends from the arbor r' into proximity to the shaft p^4 , and a projection, r^3 , carried upon the arm r^2 , extends into the path of the cam p^3 . The revolution of the cam p^3 when the train of gear is released throws the arm r^2 upward, thereby acting through the arms r and k^6 to release the wheel d from the pallet e' . The type-wheel shaft will in this manner be revolved to its unison-point, at which point it will be automatically arrested by means of a device which is employed for automatically throwing the pallet e' again into engagement with the scape-wheel d . An arm, s , projects from the type-wheel shaft c' toward an arm, s' , extending from the pallet-arm k' . When the pallet e' is thrown out of engage-

ment with the teeth of the scape-wheel, the arm s' stands in the path of the arm s . The revolution of the type-wheel shaft causes the arm s to be engaged by the projection s' immediately before the type-wheel reaches its unison-point, and the arm s' is thereby thrown downward, causing the pallet e' to be again thrown into the path of the scape-wheel, thereby arresting the type-wheel at its unison-point.

The type-wheel is preferably so constructed that a blank space is left at the point which is brought above the platen by the first vibration of the escapement-anchor after it has been brought to unison. This construction is desired for the reason that it is impossible to actuate the printing mechanism while the type-wheel is at its unison-point, and it is therefore necessary that the blank or space-place be other than the unison-point of the type-wheel. It is desirable to so arrange the type upon the wheel that those characters which are more frequently employed in printing will be first brought above the platen.

It remains now merely to describe the method whereby the mechanism which is thus employed for effecting the impressions, feeding the paper, and releasing the type-wheel, is set in operation.

The electro-magnet m' is, as has already been stated, constructed to respond only when the contact-point f' is allowed to rest against the stop f^2 . When, however, this magnet is vitalized, its armature t' is drawn forward against the force of a retractile spring, t^2 , which is applied to its armature-lever t^3 . The long arm of the lever t^3 carries a detent or catch, t^4 , which is normally held in the path of an arm, v , which is carried upon the shaft p^4 . So long as the electro-magnet m' is not vitalized the shaft p^4 is prevented from revolving, and thus the train of mechanism a^5 , which is driven by the spring a^2 , is held at rest. When, however, the electro-magnet m' is vitalized, the stop t^4 is thrown out of the path of the arm v , and the arbor p^4 is permitted to revolve, and to effect thus the operations which have already been described. It is evident, however, that it is desirable that the stop t^4 be immediately thrown again into the path of the arm v after it has been released, so that the arbor p^4 may not complete more than one revolution. For this purpose an arm, w , (see Fig. 5,) is carried upon the arbor t of the lever t^3 , and this arm projects into proximity to the cam p^3 . This arm will be engaged by the cam after the arm r^2 has been engaged, and it will thus serve to automatically throw the armature t' away from its electro-magnet and place the stop t^4 in the path of the arm v . The electro-magnet m' will also be automatically demagnetized by the interruption of the circuit of the local battery o' as soon as the type-wheel is released and it commences to move toward its unison-point. This result will be accomplished by reason of the movement of the cam-wheel f^5 beneath the projection f^6 , thereby throwing the point

f' away from the stop f^2 in the manner already described.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, with a type-wheel, and means, substantially such as described, tending to advance the same, of a scape-wheel for permitting a step-by-step movement of said type-wheel, two independent shafts upon which said scape-wheel and type-wheel are mounted, an electro-magnet for releasing said scape-wheel from its anchor, a local circuit in which said electro-magnet is included, a cam-wheel moving with said scape-wheel, an arm resting upon said cam-wheel and receiving therefrom a to-and-fro movement, and a contact-point through which the connections of said local circuit are completed, which contact-point is prevented from remaining in a position to complete said local circuit while said scape-wheel is being actuated.

2. The combination, substantially as hereinbefore set forth, with a type-wheel and its shaft, of a scape-wheel, an escapement-anchor for permitting said scape-wheel to advance step by step, and an electro-magnet for controlling the movements of said escapement-anchor, a second electro-magnet for causing said anchor to release said scape-wheel, and a printing-platen for effecting impressions from said type-wheel, which platen is actuated when said second electro-magnet is vitalized.

3. The combination, substantially as hereinbefore set forth, with a type-wheel and a type-wheel shaft, of a scape-wheel, an escapement-anchor applied to said scape-wheel, means for controlling the movements of said anchor, a printing-platen for effecting impressions from said type-wheel, mechanism for causing said printing-platen to be actuated, means for causing said scape-wheel to be released from said anchor, an electro-magnet for controlling said mechanism, and means, substantially such as described, for causing the electro-magnet to be vitalized only when said type-wheel has been brought to rest.

4. The combination, substantially as hereinbefore set forth, with a type-wheel, a scape-wheel, an escapement-anchor for controlling the movements of said scape-wheel, and means for controlling the movements of said anchor, of a printing-platen for effecting impressions from said type-wheel, mechanism, substantially such as described, for actuating said printing-platen, a paper-feeding device controlled by the same mechanism, and means, substantially such as described, for actuating said paper-feeding device immediately before and immediately after an impression is effected, and for preventing it from being actuated during the time said printing-platen is effecting an impression.

5. The combination, substantially as hereinbefore set forth, of a type-wheel, a scape-wheel controlling the movements of the same, an anchor applied to said scape-wheel, means for controlling the movements of said anchor,

a printing-platen, mechanism, substantially such as described, for effecting impressions from said type-wheel, mechanism for operating the same, and an independent paper-feeding device consisting of two rollers, one of which is actuated by said mechanism, while the other is actuated by impingement against the same, and means, substantially such as described, for raising the last-named roller from the first-named roller when an impression is being taken from said type-wheel.

6. The combination, substantially as hereinbefore set forth, with a type-wheel and means, substantially such as described, for imparting a step-by-step movement to the same, of a mechanically-operated device for effecting impressions from said type-wheel, a detent, and a stop for normally preventing said device from being operated, an electro-magnet for removing said detent from the path of said stop when it is desired to effect an impression, and a mechanically-operated device for again forcing said detent into the path of said stop after it has been withdrawn by the action of said electro-magnet.

7. The combination, substantially as hereinbefore set forth, of a type-wheel, a scape-wheel, an escapement-anchor for controlling the movement of said scape-wheel, a pallet carried upon said anchor and a second pallet movably supported upon said anchor, means for holding said second pallet in either of two positions relative to the first-named pallet and normally in engagement with said scape-wheel, and means, substantially such as described, for automatically moving said pallet from the path of said scape-wheel.

8. The combination, substantially as hereinbefore set forth, with an electro-magnet, and its armature and armature-lever, of a scape-wheel, two escapement-pallets applied to said wheel, one of which is fixed upon said lever, while the other is supported upon an arm pivoted to said lever, a mechanically-operated device for releasing said pivoted pallet from engagement with said scape-wheel, and a second electro-magnet serving, when vitalized, to set said device in operation.

9. The combination, substantially as hereinbefore set forth, with an electro-magnet, and its armature and armature-lever, of an escapement-anchor, one of the pallets of which is movable independently of the other, a scape-wheel to which said anchor is applied, mechanism for forcing said movable pallet out of engagement with said scape-wheel, a detent which normally prevents said mechanism from acting, an electro-magnet which, when vitalized, removes said detent from the path of said mechanism, a local circuit in which said second electro-magnet is included, and means, substantially such as described, for preventing the connections of said local circuit from being completed a sufficient length of time to vitalize said second electro-magnet during the time said scape-wheel is being actuated.

10. The combination, substantially as here-

inbefore set forth, of an electro-magnet, its
armature and armature-lever, a type-wheel, a
sape-wheel for permitting a step-by-step
movement of said type-wheel, an anchor for
5 controlling the movements of said scape-wheel,
one of the pallets of which anchor is movable
independently of the other, means, substan-
tially such as described, for releasing said
scape-wheel from said anchor by the move-
10 ment of said movable pallet, and an arm mov-
ing with said scape-wheel, which serves to
throw said pallet into engagement with said
scape-wheel when said type-wheel has reached
its unison-point.

15 11. The combination, substantially as here-
inbefore set forth, with a type-wheel and its
shaft, of a scape-wheel for occasioning a step-
by-step movement of said type-wheel, an es-

capement-anchor applied to said scape-wheel,
one of the pallets of which anchor is movable 20
independently of the other, means, substan-
tially as described, for effecting an impression
from said type-wheel and for moving said
movable pallet out of engagement with said
scape-wheel, and an arm moving with said type- 25
wheel, which automatically causes said pallet
to re-engage said scape-wheel when said type-
wheel has reached its unison-point.

In testimony whereof I have hereunto sub-
scribed my name this 26th day of June, A. D. 30
1884.

HENRY VAN HOEVENBERGH. [L. S.]

Witnesses:

DANL. W. EDGECOMB,

CHARLES A. TERRY.