

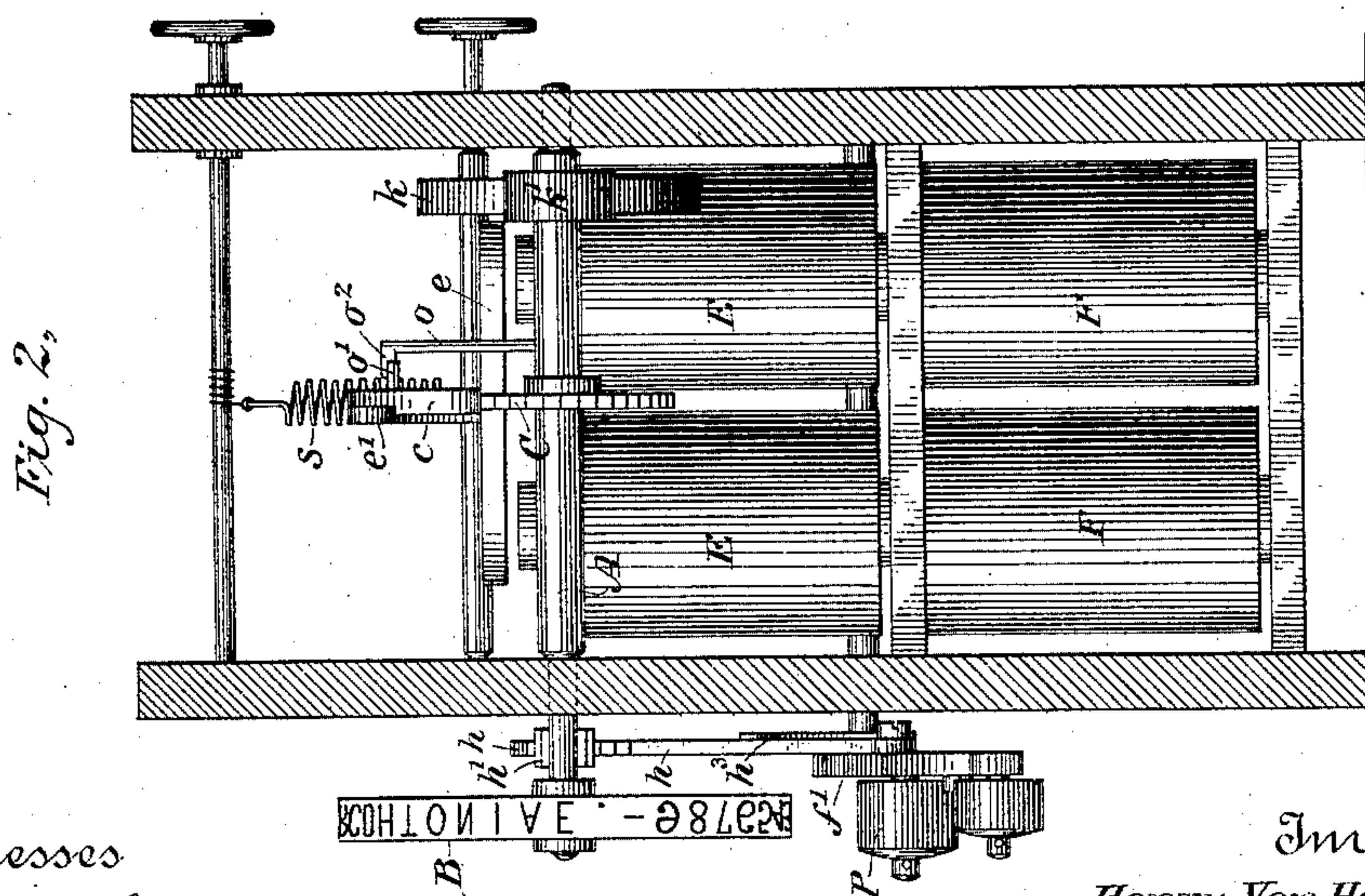
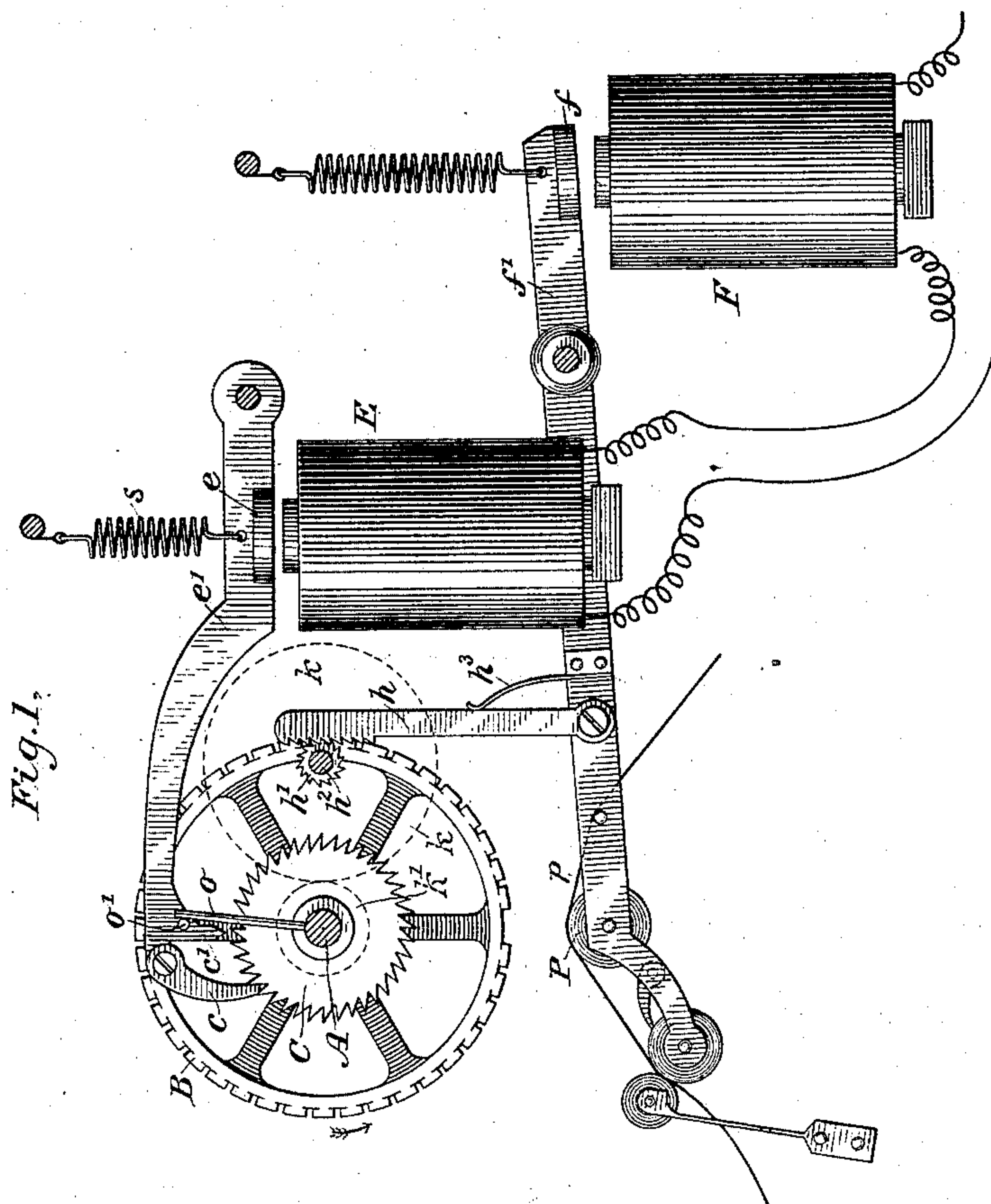
(No Model.)

H. VAN HOEVENBERGH.

UNISON DEVICE FOR PRINTING TELEGRAPHS.

No. 316,691.

Patented Apr. 28, 1885.



Witnesses

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UNISON DEVICE FOR PRINTING-TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 316,691, 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 printing telegraphic dispatches and messages through the agency of electric currents transmitted over a single main-line conductor.

The object of the invention is to provide an instrument which is capable of printing with as great rapidity as the instruments commonly employed for this purpose, and which will at all times be maintained in unison with the transmitting apparatus.

It has been heretofore proposed to advance a type-wheel step by step until the required type is in position to be printed, and to advance it automatically to unison after the impression has been effected.

My invention is based upon this principle; and it consists in certain improvements in the method of executing it.

In carrying out my invention I mount the type-wheel rigidly upon a shaft, which is provided with a ratchet-wheel capable of being advanced step by step through the action of a suitable pawl controlled by an electro-magnet. This electro-magnet is designed to respond to impulses of a given strength, and to thereby cause the successive type upon the type-wheel to be brought in turn above the printing-platen. The lever upon which the pawl is carried also carries a suitable dog or click, which enters the spaces between the successive teeth of the ratchet-wheel and prevents the type-wheel from advancing more than one type for each advance movement of the pawl. This click also prevents the type-wheel from being moved in either direction so long as the electro-magnet, which controls the movement of the pawl, remains vitalized.

For the purpose of advancing the type-wheel to its unison-point after each impression, a second ratchet-wheel is connected with the type-wheel shaft through a frictional con-

nection, and this second ratchet-wheel is designed to be rotated by the printing-lever when the latter is moved away from the type-wheel. To this end a segmental rack is carried upon the printing-lever, which, when the lever is elevated, passes freely over the teeth of the ratchet-wheel, but during the return movement of the lever engages the teeth of the ratchet-wheel and causes it to rotate. This movement of the second ratchet-wheel is communicated through the frictional gearing to the type-wheel, and the latter is revolved, the first-named ratchet-wheel being released from the click carried by its actuating-lever. When the type-wheel has been thus advanced through the action of the printing-lever to its unison-point, it is arrested by the contact of an arm upon the type-wheel shaft with a pin carried upon the type-wheel actuating-lever. The printing-lever, however, is allowed to return to its normal position by reason of the frictional gearing which intervenes between the first and second ratchet-wheels. The first subsequent movement of the type-wheel actuating-lever releases the unison-arm from its stop and permits the type-wheel to be advanced.

It will be evident that for the purpose of rapid printing it will be desirable to so arrange the characters upon the type-wheel that those most frequently employed shall be so located that they will be brought first above the platen by the movement of the actuating-lever, while those least frequently employed are placed so that nearly a complete revolution of the type-wheel will be required before they are brought into position to print.

In the accompanying drawings, Figure 1 is an elevation of such parts of a printing-telegraph instrument as are required to illustrate my invention, and Fig. 2 is a front view of the same.

Referring to the drawings, A represents a type-wheel shaft, upon which is carried a type-wheel, B. The type-wheel is preferably rigidly secured to the shaft, as is also a ratchet-wheel, C. The wheel C is designed to contain as many teeth as there are characters upon the type-wheel, so that for each advancement of the ratchet-wheel through a space occupied

by a single tooth a different type upon the type-wheel will be brought above the printing-platen P of the instrument.

For the purpose of advancing the type-wheel step by step, an electro-magnet, E, is employed, and this electro-magnet is provided with an armature, *e*, carried upon a lever, *e'*. Upon the lever *e'* is pivoted a pawl, *c*, which is designed to engage the teeth of the ratchet-wheel C, and for each forward movement of the armature-lever to advance the same one tooth. A retractile spring, *s*, normally retains the armature-lever away from its electro-magnet in the position shown in the drawings. A detent or click, *c'*, is carried upon the lever, which, while the armature-lever is in the position shown in the drawings, is out of engagement with the ratchet-wheel; but when the lever is in its forward position the click is caused to pass between two teeth of the ratchet-wheel and to lock the same in the position which it has been caused to occupy by reason of the pawl *c*.

The electro-magnet E is designed to cause its armature to respond to electric currents of a given strength, whether of positive or of negative polarity. It will be seen, therefore, that for the purpose of bringing any desired type upon the type-wheel above the printing-platen, it is necessary only to transmit a number of impulses sufficient to revolve the type-wheel until the desired type has been brought in its turn above the platen P.

When the desired type has been brought above the platen, it is designed to effect an impression therefrom through the agency of an electro-magnet, F, which is included in the same circuit with the electro-magnet E, but is designed to respond only to a current of greater strength or else of greater duration than those employed for actuating the electro-magnet E. Such a current will cause the armature *f* of the electro-magnet F to be drawn toward the electro-magnet, thereby actuating the armature-lever *f'* and causing the platen P to carry the paper-tape *p* against the type-wheel, and thus to effect an impression in a manner well understood. It will be seen, moreover, that during the time the electro-magnet F is vitalized the electro-magnet E also remains vitalized and the type-wheel is firmly locked in its position by means of the click *c'*.

Upon the armature-lever *f'* is carried a rack-bar, *h*. This rack-bar is designed to engage a pinion or ratchet-wheel, *h'*, which is supported upon a shaft or arbor, *h²*. Upon the same arbor *h²* is carried a frictional gear-wheel, *h³*, which in turn impinges against a frictional pinion, *h'*, carried upon the type-wheel shaft A. The rack-bar *h* is pressed against the pinion *h'* by a spring, *h³*, which, however, permits the upward movement of the rack over the teeth of the pinion without actuating the same when the printing-lever is raised for the purpose of effecting an impression. During the return movement of the lever, however, the teeth of the rack-bar engage the

teeth of the pinion and cause the latter to revolve in the direction indicated by the arrow. If, therefore, the type-wheel be free to move when the armature-lever *f'* is returning to its normal position, it will be advanced by reason of the frictional connection existing between the pinion *h* and the type-wheel shaft A; and it is evident, moreover, that upon the interruption of the current employed for effecting an impression the armature *e* will be allowed to fall away from its electro-magnet, thereby disengaging the click *c'* from the teeth of the ratchet-wheel C. The length of the rack-bar *h* and the relative sizes of the ratchet-pinion *h'* and frictional gear-wheel *h³* are so adjusted that the downward movement of the armature-lever will be sufficient to revolve the type-wheel through one complete revolution, or at least through a complete revolution less the arc occupied by a single type and intervening space. In whatever position, therefore, the type-wheel has been arrested for the purpose of printing, the return movement of the printing-lever will cause the type-wheel to advance to its starting-point. At this point it is designed that the type-wheel shall be arrested by means of a unison-stop. This unison-stop consists of an arm, *o*, carried upon the type-wheel shaft A and extending therefrom a sufficient distance to engage with a pin or detent, *o'*, carried upon the armature-lever *e'*.

Upon the end of the arm *o* is carried a lateral projection, *o²*, which is designed to strike against the pin *o'*, provided the armature-lever *e'* is in its position away from the electro-magnet. When, therefore, the type-wheel is revolved by reason of the action of the printing-lever *f'*, it will be arrested at its unison-point by reason of the arm *o* and detent *o'*. The subsequent downward movement, however, of the armature-lever *e'* will cause the pin *o'* to pass out of the path of the projection *o²* upon the arm *o*, and permit the type-wheel to be advanced under the influence of the pawl *c*.

It is evident that it is desirable that the letters most frequently employed in printing shall be the ones first brought above the printing-platen, for in this manner a less number of impulses will be required for bringing these letters into position to print. For this purpose I prefer to place the letters in substantially the following order, commencing at the unison-point, namely, E A I N O T H D C R, &c. The precise order of letters, however, is not essential, as any convenient order of succession may be employed as seen fit.

For the purpose of advancing the paper-tape when the impressions have been effected, any suitable form of paper-feeding device may be employed.

In an application of even date herewith, Serial No. 139,883, there is shown and described a unison device brought into action by the printing-lever, and such an organization is broadly claimed therein.

I claim as my invention—

1. The combination, substantially as here-
inbefore set forth, with the type-wheel of a
printing-telegraph instrument, of an electro-
magnet, means, substantially such as de-
scribed, for advancing said type-wheel step by
step through the agency of said electro-mag-
net, a printing-lever, and means, substantially
such as described, for causing an advance
movement of said type-wheel through the
agency of said printing-lever when said lever
moves away from said type-wheel.

2. The combination, substantially as here-
inbefore set forth, with the type-wheel of a
printing-telegraph instrument, and means,
substantially such as described, for advancing
it step by step, of a printing-lever, a rack-bar
moving with said printing-lever, a toothed
wheel or pinion engaged by said rack-bar and
caused to rotate when said lever moves away
from said type-wheel, and means, substan-
tially such as described, for communicating
the movement of said ratchet-wheel or pinion
to said type-wheel.

3. The combination, substantially as here-
inbefore set forth, with the type-wheel of a
printing-telegraph instrument and means for
advancing it, of a printing-lever, a toothed
bar moving with said printing-lever, a ratchet-
wheel or pinion to which said bar is applied,
and a frictional gearing between said ratchet-
wheel or pinion and said type-wheel.

4. The combination, substantially as here-
inbefore set forth, with the type-wheel of a
printing-telegraph instrument, of a ratchet-
wheel moving with said type-wheel, a pawl
for advancing said ratchet-wheel step by step,
an electro-magnet for actuating said pawl, a
printing-lever for effecting impressions from
said type-wheel, a wheel caused to advance
by the movements of said printing-lever away
from said type-wheel, and a frictional gearing
between the last-named wheel and said type-
wheel.

5. The combination, substantially as here-

inbefore set forth, with the type-wheel of a
printing-telegraph instrument, of a pawl and
ratchet-wheel for actuating the same step by
step, a click for engaging said ratchet-wheel
when said pawl has caused an advancement
of said type-wheel, a printing-lever for effect-
ing impressions from said type-wheel while
said ratchet-wheel is engaged by said click,
and means, substantially such as described,
for advancing said type-wheel to its unison-
point after an impression has been taken there-
from and said ratchet-wheel has been released
from said click.

6. The combination, substantially as here-
inbefore set forth, with the type-wheel, and
means, substantially such as described, for
advancing the same step by step, of a print-
ing-lever and a frictional connection between
said lever and said type-wheel whereby the
latter is advanced.

7. The combination, substantially as here-
inbefore set forth, with the type-wheel of a
printing-telegraph instrument, of an electro-
magnet, its armature and armature-lever for
effecting a step-by-step advancement of said
type-wheel, a printing-lever for effecting im-
pressions therefrom, a frictional connection
between said printing-lever and said type-
wheel whereby the latter is automatically ad-
vanced after an impression has been effected
therefrom, and a device for arresting said type-
wheel in a given position when it is so ad-
vanced, which device consists of an arm mov-
ing with said type-wheel and a detent carried
upon the first-named armature-lever, which
detent is in the path of said arm only when
said arm is remote from said electro-magnet.

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

HENRY VAN HOEVENBERGH. [L. S.]

Witnesses:

DANL. W. EDGEComb,
CHARLES A. TERRY.