(No Model.)

# H. MAHNKEN.

## PRINTING TELEGRAPH RECEIVER.

No. 384,455. Patented June 12, 1888.

Fig. 1.

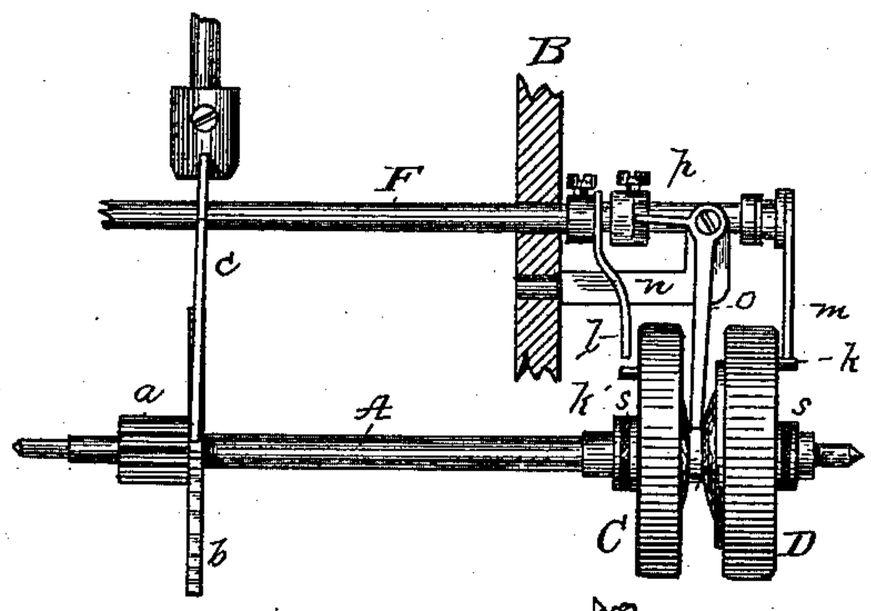



Fig. 3.

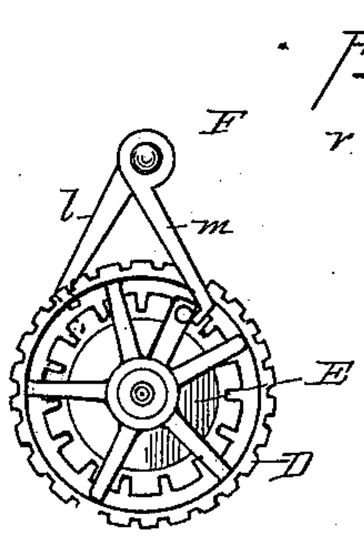



Fig. 4.

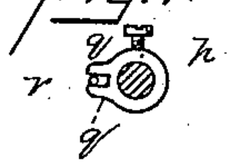



Fig. 7.

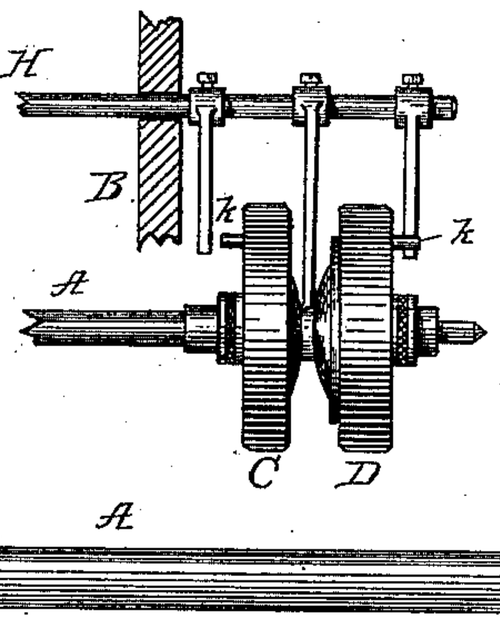



Fig. 5.




Fig. 2.




Fig. 9.

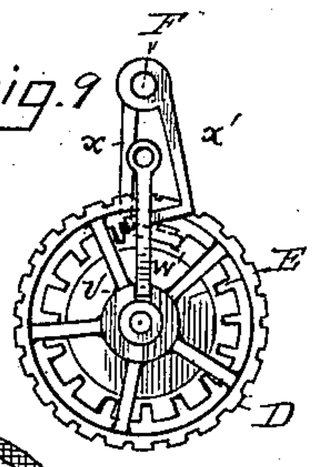



Fig. 6.

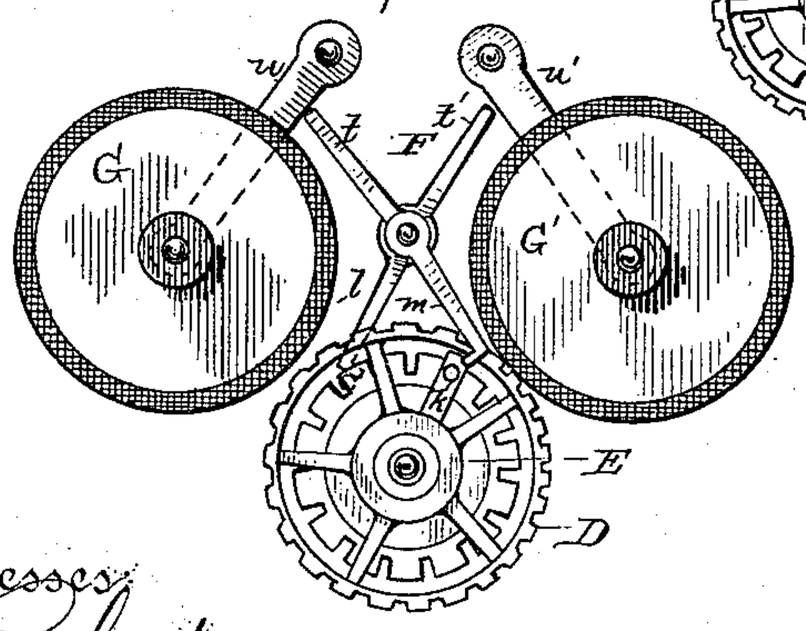
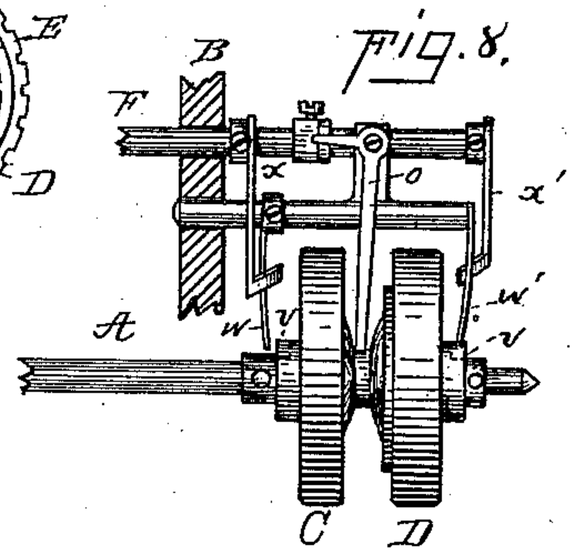



Fig. 8.

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# UNITED STATES PATENT OFFICE.

HENRY MAHNKEN, OF NEW YORK, N. Y., ASSIGNOR TO JOHN ANDERSON, OF SAME PLACE.

## PRINTING-TELEGRAPH RECEIVER.

SPECIFICATION forming part of Letters Patent No. 384,455, dated June 12, 1888.

Application filed November 21, 1887. Serial No. 255,735. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY MAHNKEN, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Printing-Telegraph Receivers, of which the following is a specification.

The object I have in view is to produce a printing-telegraph receiver having two independently-rotating type-wheels driven from one source of power and controlled by a single escapement, which receiver will be so constructed as to insure the bringing of the idle-wheel automatically to unison each time the power is shifted from one wheel to another, and to permit the proper shifting of the power from one wheel to the other, although the wheels may be out of unison. In fact, my machine is adapted to have the capacity and advantages of the Field two-line printer, which employs two power-trains for driving the independent type-wheels, two escapements operated from one vibrating armature, and unison devices for alternately locking the type-wheels.

My invention consists in the several novel devices and combinations of parts, as fully hereinafter explained, and pointed out by the claims.

In the accompanying drawings, forming a part hereof, Figure 1 is a side elevation of the type-wheels and of sufficient of the connected parts of a printer to illustrate my invention; Fig. 2, an elevation, on an exaggerated scale, of the type-wheel shaft with the type-wheels in section; Fig. 3, an end view of the wheels; Fig. 4, a section through the shifting-shaft, showing in elevation the collar for moving the clutch-lever; Fig. 5, an elevation of the sliding clutch; Fig. 6, an end view of the type-wheels, showing means for lifting the ink-roller from the idle-wheel; Fig. 7, an elevation similar to Fig. 1, showing a sliding rod for the clutch and unison arms instead of the rocking shaft of Fig. 1; Fig. 8, an elevation, similar to Fig. 1, of a modified arrangement for bringing the wheels automatically to unison; and Fig. 9, an end view of the type-wheels of this modification.

A is a type-wheel shaft having a pinion, *a*, which is the last wheel of a weight-train, as will be understood. This shaft has an escapement-wheel, *b*, with which engages an escapement-anchor, *c*, for producing a controlled step-by-step movement. Upon the shaft A, outside of the frame B of the machine, are mounted side by side two type-wheels, C D. These ride directly, but loosely, upon the shaft, each being held from longitudinal movement thereon by a collar, *d*, and a disk, *e*, fixed to the shaft.

Between the type-wheels the shaft A is provided with a clutch, E, sliding longitudinally on the shaft, but prevented from turning thereon by a feather, *f*. This clutch has end disks, *g*, which are provided with slots *h* on their edges. These slots on each disk may be as many in number as the characters of each type-wheel, the object being to permit the shifting of the clutch at any point; but I have found as a practical measure that the slots need only be half as many in number as the type-wheel characters, since the shifting will always be done with the same polarity of current impulse in the type-wheel circuit; hence, with thirty type-wheel characters on each wheel, the clutch-disks need have only fifteen slots, as shown; but they may have thirty of such slots, as before stated. Each type-wheel has a flat clutch-pin, *i*, on its inner side in position to engage the slots of the adjoining clutch-disk, and each type-wheel also has in the preferred form a unison-stop pin, *k*, projecting from its outer side.

F is a rock-shaft having a rocking movement back and forth through a small part of a revolution. It has unison-stop arms *l m* secured thereto. These arms are thrown alternately into the paths of the type-wheel stop-pins by the rocking of the shaft, one position of the shaft bringing the arm *l* into the path of the stop-pin *k* on the wheel C, the arm *m* being then out of the path of the stop-pin of the wheel D, while the other position of the shaft brings the arm *m* into the path of the stop-pin on the wheel D and removes the arm *l* from the path of the stop-pin of the wheel C. Upon an arm, *n*, from the frame B is pivoted the clutch-lever *o*, which enters at its lower end the central groove of the sliding clutch E and acts to throw the clutch in one direction or the other.

To move the clutch-lever from the rock-shaft F and give it the proper length of throw,

a collar, *p*, is secured by a set-screw on the rock-shaft. It has two laterally-projecting fingers, *q*, which embrace a horizontal arm, *r*, on the upper end of the clutch-lever. By adjusting the collar *p* along the rock-shaft it can be made to act on the horizontal arm of the clutch-lever nearer to or farther away from the pivot of the clutch-lever, and thus the throw that the clutch-lever will be given by the rock-shaft can be nicely adjusted. To increase the friction between the shaft A and the type-wheels, washers *s*, of billiard-cloth or other suitable packing material, may be placed between the hubs of the type-wheels and the outer collars, *d*.

Now it will be seen that when the parts are as shown in Figs. 1, 2, and 3 the letter-wheel C is clutched to the shaft A and will be turned thereby, while the figure-wheel D will be free from the clutch, and will be held from turning by the unison-arm *m*, the turning of the shaft causing the figure-wheel to keep its stop-pin positively against the unison-arm *m*, and holding the figure-wheel at unison by the constant, though slight, strain transmitted by friction from the turning shaft. The figure-wheel being at unison will only print the unison-dot. When the printing with the letter-wheel is completed and it is desired to print from the figure-wheel, the figure unison-dot key at the transmitter is depressed. The effect of this is to run the letter-wheel to unison and to print the dots on both wheels, the shifting of the rock-shaft F being accomplished by the movement of the printing-lever or simultaneously therewith, as will be understood. This movement of the rock-shaft will throw the clutch-lever, moving the clutch E to the right, unlocking the letter-wheel C from and locking the figure-wheel D to the shaft A. At the same time the unison-arm *l* will be thrown into engagement with the stop-pin *k* of the wheel C, while the arm *m* will be moved out of the path of the stop-pin of the wheel D. Now the wheel D will be turned and printed from until it is desired to again print from the letter-wheel. If in shifting from one type-wheel to the other the wheel that has been running is out of unison, or if the shifting is done while the running wheel is at another character than the unison-dot, then both wheels will be turned by the shaft, the wheel not clutched thereto being carried around by friction until it is brought to unison and is stopped by the unison-stop arm.

The rock-shaft F may be shifted by the upward movement of the printing-lever, a neutral magnet in the type-wheel circuit determining whether the printing-lever will rock the shaft in one direction or the other. This neutral directing-magnet gives either of the two opposite directions to the movement, according to whether the current in the type-wheel circuit is strong or weak at the time of stopping for printing. This is a well-known unison-producing arrangement, and is not illustrated by the drawings, it being used in the Field printer and shown by the Field Patent No. 274,300. Instead of shifting the rock-shaft in this way, it may be moved by a polarized magnet in the printing-circuit, the printing-magnet being neutral and the rock-shaft being shifted or held in the same position, according to whether the polarity of the printing-current is reversed or maintained in the same direction. This is also a well-known arrangement. I add to this unison-shaft the function of moving the clutch for locking the wheels alternately to the driving-shaft. It will be understood that the clutch, as well as the unison-arms, will be shifted or corrected in their position each time the printing-circuit is operated.

Since it is important that the idle-wheel should produce the minimum retarding friction on the driving-shaft and still sufficient to carry the wheel to unison, and since the resting of the ink-roller on the idle-wheel makes necessary additional friction, I have arranged devices for lifting the ink-roller off of the idle-wheel, Fig. 6. The rock-shaft F has two arms, *t t'*, projecting toward the pivoted arms *u u'*, which carry the ink-rollers G G'. In one position of the rock-shaft (that to stop the letter type-wheel C) the arm *t* strikes the arm *u* and lifts the ink-roller G off of the type-wheel C, the ink-roller G' then resting on the running wheel D, as shown in Fig. 6. In the other position of the rock-shaft the arm *t'* strikes the arm *u'*, lifting the ink-roller G' off of the type-wheel D, while the arm *t* leaves the arm *u*, permitting the roller G to drop onto the type-wheel C.

Instead of using a rock-shaft, F, for working the unison-stop arms and the clutch-lever, a sliding rod, H, Fig. 7, may be employed for that purpose.

In Figs. 8 and 9 is illustrated an arrangement for still further reducing the friction at the type-wheels. In this arrangement the friction washers *s* may be omitted, and the type-wheels may ride loosely between the retaining collars and disks *d e*. The hubs of the type-wheels have each a slot, *v*, and into these slots take two small springs, *w w'*, when released. These springs when they are in the slots hold the type-wheels without other friction than that caused by the weight of the wheels. Should, however, a wheel be out of unison in shifting, the spring would bear against the face of the hub and force the wheel by a light pressure against the inner retaining-disk, when it will be given added friction and will be turned by the shaft, although not clutched thereto, until the spring drops into the slot when the pressure on the hub is removed. For withdrawing the springs *w w'* alternately from the slots of the type-wheels, the rock-shaft F is provided with arms *x x'*, having ends which take from opposite sides obliquely under the springs *w w'*, as shown in Fig. 8, and withdraw them alternately from the slots in the hubs of the type-wheels.

What I claim is—

1. In a printing-telegraph receiver, the

combination, with a single driving-shaft, of two type-wheels and a clutch acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, substantially as set forth.

2. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels riding on the shaft and a clutch located between the type-wheels and acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, substantially as set forth.

3. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels, a clutch acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, and unison-stops acting to stop at unison the wheel not clutched to the shaft, such wheel being rotated by the shaft until stopped at unison, substantially as set forth.

4. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels, a clutch acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, unison-stops acting to stop at unison the wheel not clutched to the shaft, and friction-producing devices causing the idle-wheel to be rotated by the shaft until arrested at unison, substantially as set forth.

5. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels, a clutch acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, unison-stop arms acting to arrest the type-wheels alternately, and a moving shaft or rod connected with the unison-stop arms and clutch-lever for operating them together, substantially as set forth.

6. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels riding on the shaft, a clutch located between the type wheels and acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, a moving shaft for working the clutch-lever, and an adjustable connection between the shaft and the clutch-lever, substantially as set forth.

7. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels riding on the shaft, a clutch located between the type-wheels and acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, a rock-shaft having an adjustable rocking collar, and a pivoted clutch-lever having a horizontal arm engaging fingers on the rocking collar, substantially as set forth.

8. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels, a clutch acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, springs taking alternately in slots in the type-wheels or bearing thereon to produce friction, and arms acting to withdraw the springs alternately from such slots, substantially as set forth.

9. In a printing-telegraph receiver, the combination, with two rotating type-wheels, of separate inking-rollers bearing thereon and working parts lifting such rollers alternately from the type-wheels, whereby only the wheel that is being printed from will have an inking-roller bearing on it, substantially as set forth.

10. In a printing-telegraph receiver, the combination, with two independently-rotating type-wheels and unison-stop arms thrown alnately into the paths of rotation of working parts for stopping the type-wheels alternately at unison, of separate inking-rollers for such type-wheels and lifting-arms working with the unison-stop arms and acting to lift the inking-rollers alternately from the type-wheels, substantially as set forth.

11. In a printing-telegraph receiver, the combination, with a single driving-shaft, of two type-wheels, a clutch acting at any point in the revolution of the type-wheels to lock either type-wheel to the shaft, unison-stops acting to stop at unison the wheel not clutched to the shaft, such wheel being rotated by the shaft until stopped at unison, separate inking-rollers bearing on the type-wheels, and working parts lifting such rollers alternately from the type-wheels to reduce the friction of the idle wheel on the shaft, substantially as set forth.

This specification signed and witnessed this 19th day of November, 1887.

HENRY MAHNKEN.

Witnesses:
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E. C. ROWLAND.