April 25, 1950 R. D. SALMON 2,505,008

PRINTING TELEGRAPH RECEIVER

Filed Dec. 13, 1946 3 Sheets-Sheet 1

FIG 1

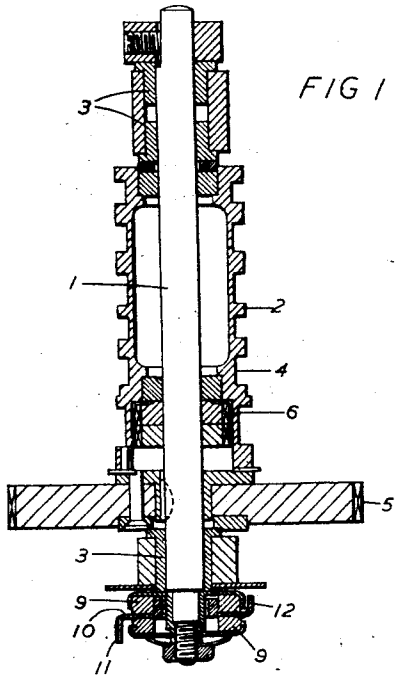


FIG. 2.

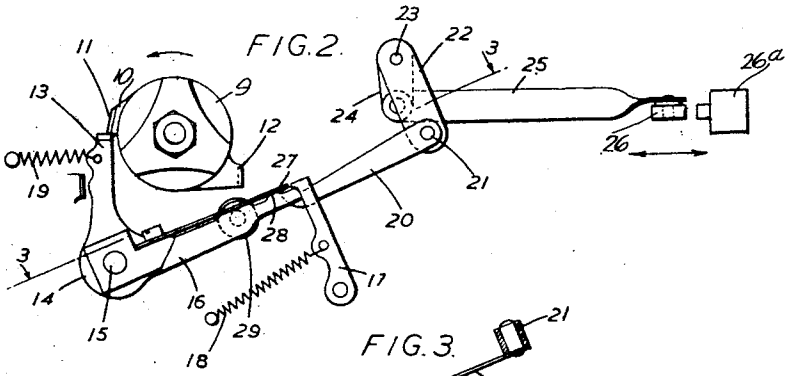
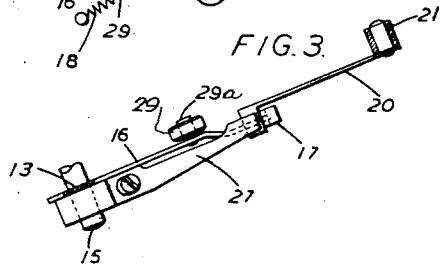


FIG. 3.



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PRINTING TELEGRAPH RECEIVER

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FIG. 4.

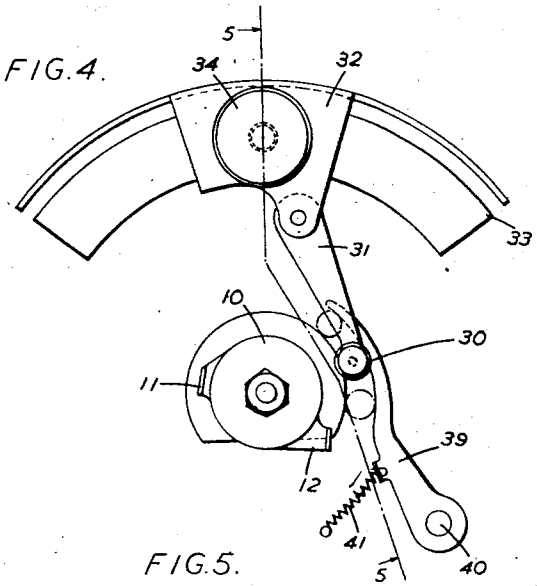
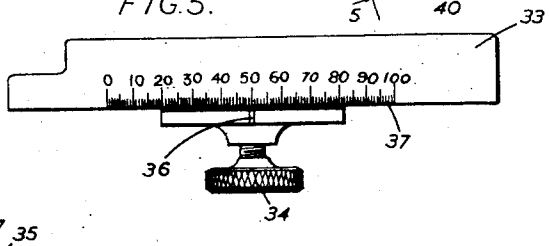


FIG. 5.



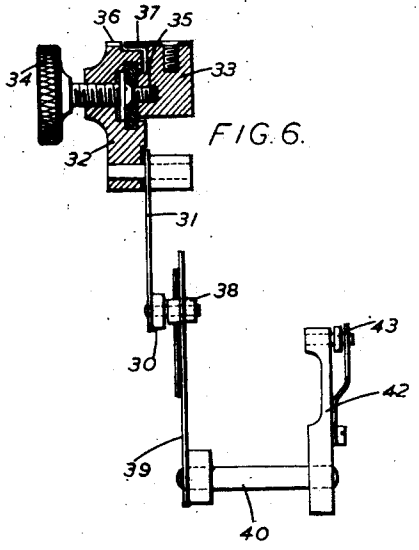


FIG. 6.

FIG. 7.

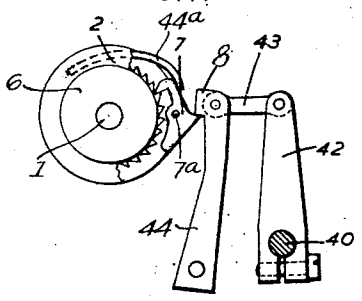


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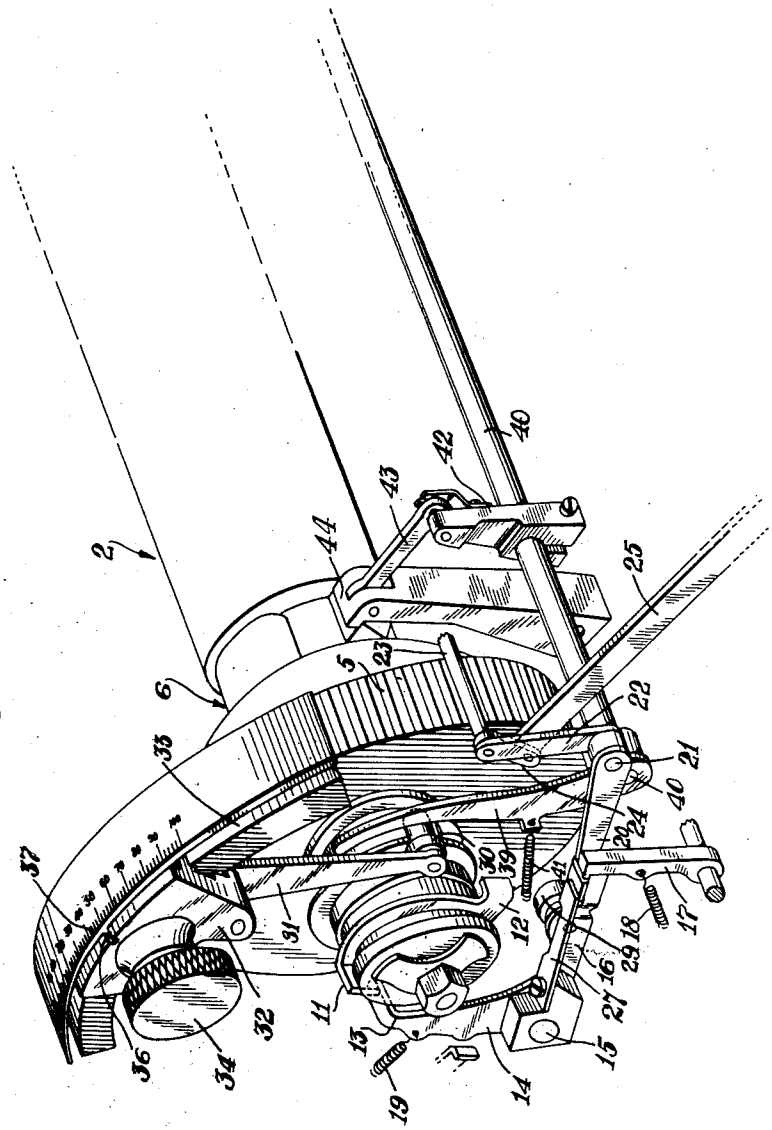
Fig. 8.



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Patented Apr. 25, 1950 2,505,008

UNITED STATES PATENT OFFICE

2,505,008

PRINTING TELEGRAPH RECEIVER

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Application December 13, 1946, Serial No. 715,904
In Great Britain November 6, 1945

Section 1, Public Law 690, August 8, 1946
Patent expires November 6, 1965

7 Claims. (Cl. 178—33)

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This invention relates to printing telegraph receivers.

A printing telegraph receiver is normally so constructed as to receive signals correctly even though they have suffered considerable distortion, but for the machine to operate correctly with the maximum permissible distortion of the signals correct adjustment of the machine is necessary.

It is advantageous that a printing telegraph receiver should be fitted with an orientation device, that is a device whereby the operation of the selector mechanism may be co-ordinated with the incoming signal impulses, as the presence of such a device permits the tolerance of a machine to distorted signals to be readily determined and thus permits a mechanic to determine whether he has carried out the required adjustment. Moreover such a device enables the machine to receive correctly signals having a greater amount of distortion than it wou'd receive without such device.

In U. S. Patent 2,286,248, issued to W. J. Jenner on June 16, 1943, there is described and claimed a selector mechanism for a printing telegraph receiver in which the stop or rest position of the cam assembly is invariable and in which orientation adjustment is effected by a variation in the time interval between the reception of a start impulse and the disablement of the mechanism retaining the cam assembly in the stop or rest positions. For this purpose a separate cam disc is provided which is released for rotation by the response of the magnet armature to the start element of a signal and itself releases the selector cam assembly for rotation. The stop position of the separate cam disc is adjustable and thus the time interval between the release of the separate cam disc and the release of the selector cam assembly is adjustable.

It is the object of the present invention to provide an orientation adjustment device that can be fitted to a machine already in current manufacture without affecting the general design and arrangement of parts of the said machine. Specifically it is the object of the present invention to fit an orientation adjustment device to the well-known Teleprinter No. 7B which is constructed and operates as described in U. S. Patent No. 1,639,213, granted August 6, 1927.

According to the present invention we provide a printing telegraph receiver comprising a magnet, an armature therefor, a driving shaft, a selector cam and a starting cam both arranged coaxially with said driving shaft, a friction clutch for driving said starting cam from said driving shaft, a ratchet clutch for driving said selector cam

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from said driving shaft, a detent for holding said starting cam in an invariable stop position against rotation, means for releasing engagement of said detent from said starting cam upon the response of said armature to the start element of a signal, a lug on said starting cam, a member mounted in the path of said lug, manually operable means for adjusting the position of said member in a path coaxial with said starting cam and means operable upon the coaction of said lug with said member to cause engagement of said ratchet clutch.

The invention will be better understood from the following description taken in conjunction with the accompanying drawings in which:

Fig. 1 shows the cam shaft of the machine described in said U. S. Patent No. 1,639,213, with the modifications according to the present invention.

Fig. 2 is an end view of Fig. 1 looking in the direction of the arrow, and of the starting mechanism according to the present invention.

Fig. 3 is a view of Fig. 2 on the line 3—3.

Fig. 4 shows the orientation device.

Fig. 5 is a top plan view of Fig. 4.

Fig. 6 is a section on line 5—5 of Fig. 4.

Fig. 7 shows the arrangement for releasing the ratchet clutch.

Fig. 8 is a perspective view of the orientation device and of the starting mechanism according to the present invention.

Referring to the drawings, Fig. 1 shows the cam assembly for the machine described in said Patent 1,639,213.

The machine includes the driving spindle or shaft 1 for the cam assembly 2 which is mounted in plain bearings 3. The cam assembly 2 carries a cam groove 4 which actuates a striker pin (not shown) and which is hereinafter referred to as a selector cam, since the instants at which the striker pin is actuated determine the selector action and these instants ought to occur at the middle of each code element of the signal combination The cam assembly 2 also carries other cams for determining the traversing of the striker pin and for performing other functions, but as these operations are fully described in the above mentioned specification and are not necessary to an understanding of the present invention, they need not be described herein. The shaft 1 is continuously driven during the operation of the machine by means of a gear wheel 5. The shaft 1 passes coaxially through the cam assembly 2 and carries ratchet wheels 6 for cooperation with pawls 7 (Fig. 7) pivotally carried at 7a by the cam

assembly 2, the combination of ratchet wheels 6 and pawls 7 constituting a ratchet clutch between the shaft 1 and the cam assembly 2. The ratchet clutch is held inoperative until the proper moment by means of a detent 8 (Fig. 7) which holds the pawls 7 out of engagement with the ratchet wheels 6.

An extension of the shaft 1 beyond the driving gear wheel 5 and one of the bearings 3 carries a friction clutch 9 driving a disc 10 having on its outer edge two lugs 11 and 12 bent over in opposite directions. One lug 11 co-operates with one arm 13, Fig. 2, of a detent lever 14 pivoted at 15. The other arm 16 of the lever 14 is engaged by a retaining lever 17 urged by a spring 18 towards the arm 16. The retaining lever 17 thus holds lever 14, against the pull of a spring 19, with arm 13 holding cam disc 10 against rotation.

The retaining lever 17 is adapted to be withdrawn from engagement with arm 16 of detent lever 14 by a latch member 20 attached to a hub 21 pivotally mounted in an arm 22. Arm 22 is attached to the rock shaft 23 that carries the "striker pin" guides, and is denoted by reference character *r* in Fig. 1 of said Patent 1,639,213. This rock shaft 23 carries a second arm 24 connected by a link 25 to the armature 26 of the operating magnet 26*a*.

The latch 20 is normally held in engagement with the retaining lever 17 by a spring blade 27 mounted on arm 16 of detent lever 14. A step 28 formed on arm 16 holds the spring blade 27 so that it does not normally press against latch 20 so that the latch 20 is free to move without friction.

When the armature 26 moves in response to the start element of a signal combination, it moves to the right in Fig. 2 and thus rotates shaft 23 and with it arm 22 in a counter-clockwise direction, thus moving latch 20 to the right to be free of arm 16 of detent lever 14. Detent lever 14 is accordingly rotated counter-clockwise about its pivot 15 and arm 13 is removed from engagement with lug 11 on cam disc 10 thus allowing the latter to be driven through friction clutch 9 from shaft 1. When detent lever 14 rotates counter-clockwise arm 16 lifts latch 20 clear of retaining lever 17 so that subsequent movement of the armature 26 due to the code signal combination is free of the load of spring 18, which acts on retaining lever 17.

The cam disc 10 rotates in the direction of the arrow in Fig. 2 and towards the end of rotation thereof lug 12 thereon engages a roller 29 pivoted on pivot 29*a* carried by arm 16 of lever 14 and thereby rotates lever 14 in a clockwise direction, so that the end of arm 13 is brought into the path of lug 11 and arm 16 is again engaged by retaining lever 17 which is moved clockwise against spring 18 until the end thereof snaps over the end of arm 16 and thus holds detent lever 14 in place. Latch 20 is again brought into engagement with retaining lever 17. If at this moment armature 26 is in its right hand spring position, the latch 20 will be brought down on top of retaining lever 17 and spring blade 27 will be slightly deflected. When the armature 26 finally moves to the left hand (stop) position the latch 20 will spring down under the influence of the spring blade 27 to be ready again to withdraw the retaining lever when the next start element is received.

The lug 12 also co-operates with a roller 30 pivoted on pivot 30*a* (Fig. 4) carried by a lever

31 carried by a frame 32. The frame 32 is slidable over an arcuate portion 33 of the fixed framework of the machine so as to move the roller 30 coaxially of the cam disc 10. For this purpose frame 32 is provided with a knob 34 which can be readily grasped by the hand. The knob 34 is provided with a screwed shank 35 which screws into the portion 33 of the framework. To move the frame 32, the knob 34 is rotated to unscrew the shank 35 from engagement with the portion 33 of the fixed framework. The frame 32 and with it the lever 31 and roller 30 may then be moved and after adjustment to a new position knob 34 is screwed up to tighten the frame 32 in the new position and hold it against movement. The frame 32 carries a pointer 36 and the portion 33 of the framework a graduated scale 37 cooperating therewith.

Mounted on the same pivot with the roller 30 is another roller 38 Fig. 6 that cooperates with a lever 39 mounted on a spindle 40 journalled in fixed bearings mounted on the base of the machine. Lever 39 is urged by spring 41 into contact with roller 38 and the portion thereof that cooperates with the roller is shaped so that the centre of curvature is on the axis of rotation of driving shaft 1 and cam 10, for the position of lever 39 shown in Fig. 4. Mounted on the other end of spindle 40 is a detent lever 42 connected by a link 43 to the detent lever 44 that is normally holding pawls 7 out of engagement with ratchet wheels 6 against the pressure of their associated spring 44*a*.

Fig. 8 shows in perspective the orientation device and the starting device with each essential element of the device shown in relation to each of the other elements thereof. The same character numerals used in Figs. 1 through 7 are used to identify similar elements in Fig. 8.

The operation of the device is as follows:

The response of the armature 26 to the start element of a signal withdraws retaining lever 17 from engagement with detent lever 14 and the latter is immediately withdrawn from engagement with lug 11 of cam 10. Cam 10 is driven through friction clutch 9 from driving shaft 1 and rotates. After an interval, depending upon the setting of roller 30 by means of frame 32, lug 12 on cam 10 engages roller 30 and thereby rotates lever 39 and with it spindle 40 and lever 42 against spring 41. Lever 42 by means of link 43 removes detent 44 from engagement with pawls 7 thereby enabling these pawls to be pressed by their springs into driving engagement with the ratchet wheels 6. Thus the ratchet clutch drives cam sleeve 2, including selector cam 4.

In order to allow for the delay in release of the cam sleeve 2 with respect to the starting element and to enable the instants at which the selector cam 4 operates the striker pin to be adjusted to coincide with the middle portion of each code element of the received combination, the timing of all the cams can thus be suitably advanced.

Towards the end of the period of rotation of cam disc 10 the lug 12 thereon operates on roller 29 to restore detent lever 14 into position to co-operate with lug 11 thereon and cam disc 10 is accordingly re-arrested in its invariable stopping position.

What is claimed is:

1. Printing telegraph receiver comprising a magnet, an armature therefor, a driving shaft, a selector cam and a starting cam both arranged coaxially with said driving shaft, a friction clutch

for driving said starting cam from said driving shaft, a ratchet clutch for driving said selector cam from said driving shaft, a detent for holding said starting cam in an invariable stop position against rotation, means for releasing engagement of said detent from said starting cam upon the response of said armature to the start element of a signal, a lug on said starting cam, a member mounted in the path of said lug, manually operable means for adjusting the position of said member in a path coaxial with said starting cam and means operable upon the coaction of said lug with said member to cause engagement of said ratchet clutch.

2. Printing telegraph receiver as claimed in claim 1 in which said starting cam consists of a disc carrying said lug and a second lug co-operating with said detent.

3. Printing telegraph receiver as claimed in claim 1 comprising a detent lever for holding said ratchet clutch disengaged and a lever fixed thereto and arranged to be operated by engagement of said lug with said member, said last mentioned lever having a curved portion with its centre of curvature lying upon the axis of said driving shaft and said starting cam.

4. Printing telegraph receiver as claimed in claim 1, in which the detent co-operating with said lug consists of a two armed lever, one arm co-operating with said lug to hold said starting cam in stop position and the second arm co-operating with said second lug, immediately prior to the said starting cam reaching stopping position, to restore said first arm into position to arrest said starting cam.

5. Printing telegraph receiver according to claim 1 in which the detent cooperating with said lug consists of a two-armed lever, one arm co-operating with said lug to hold said starting cam in stopped position and the second arm cooperating with said second lug immediately prior to the said starting cam reaching stop position to restore said first arm into position to arrest said starting cam, a spring for removing said detent lever from engagement with said lug, a spring-actuated retaining lever cooperating with said second arm to hold said detent lever in position to arrest said starting cam, and a latch controlled by said armature for withdrawing said retaining lever from said detent lever upon the response of said armature to the starting element of a signal.

6. Printing telegraph receiver according to claim 1 in which the detent cooperating with said

lug consists of a two-armed lever, one arm co-operating with said lug to hold said starting cam in stop position, and the second arm cooperating with said second lug immediately prior to the said starting cam reaching said stop position to restore said first arm into the position to arrest said starting cam, a spring for removing said detent lever from engagement with said lug, a spring-actuated retaining lever cooperating with said second arm to hold said detent lever in position to arrest said starting cam, a latch controlled by said armature for withdrawing said retaining lever from said detent lever upon the response of said armature to the starting element of the signal, and a spring blade mounted on said second arm to guide said latch to engage the said retaining lever in said withdrawal and to hold said latch clear of said retaining lever during the following code elements of the signal.

7. Printing telegraph receiver according to claim 1 in which the detent cooperating with said lug consists of a two-armed lever, one arm cooperating with said lug to hold said starting cam in stop position and the second arm cooperating with said second lug immediately prior to the said starting cam reaching stopping position to restore said first arm into position to arrest said starting cam, a spring for removing said detent lever from engagement with said lug, a spring-actuated retaining lever cooperating with said arm to hold said detent lever in position to arrest said starting cam, a latch controlled by said armature for withdrawing said retaining lever from said detent lever upon the response of said armature to the start element of the signal, a spring blade mounted on said second arm to guide said latch to engage the said retaining lever in said withdrawal and to hold said latch clear of said retaining lever during the following code elements of the signal, and a step on said second arm to hold said spring co-operating with said lug to hold said starting position of the latch.

REGINALD DENNIS SALMON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,924,357	Griffith	Aug. 29, 1933
2,115,991	Kleinschmidt	May 3, 1938

Certificate of Correction

Patent No. 2,505,008 April 25, 1950

REGINALD DENNIS SALMON

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows:

Column 6, line 41, strike out the words "co-operating with said lug to hold said starting" and insert instead *blade from pressing on said latch in the normal*;

and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of July, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.

Certificate of Correction

Patent No. 2,505,008 April 25, 1950

REGINALD DENNIS SALMON

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[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.