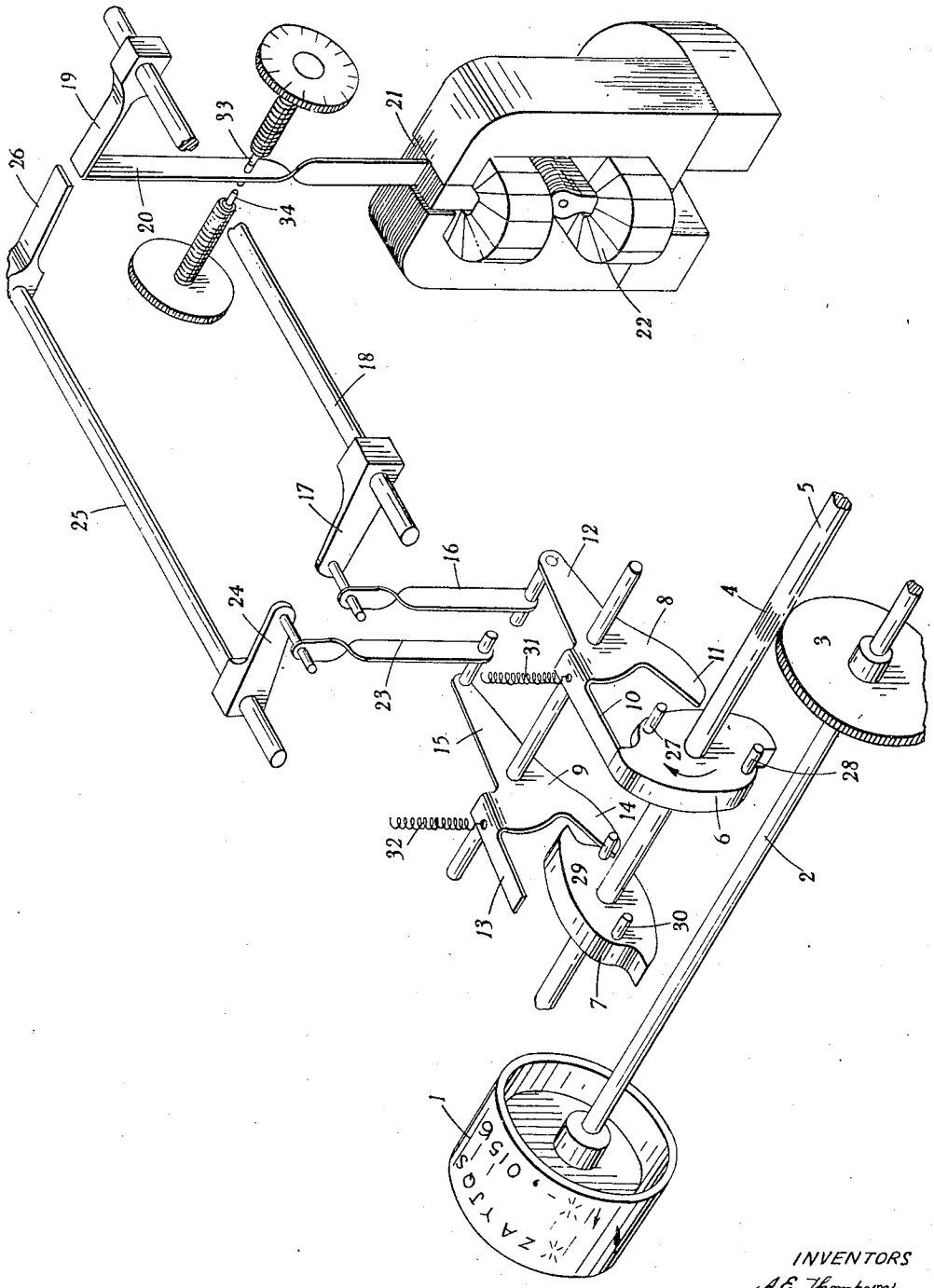
April 27, 1943. A. E. THOMPSON ET AL 2,317,496

PRINTING TELEGRAPH APPARATUS

Filed June 21, 1941



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Patented Apr. 27, 1943 2,317,496

UNITED STATES PATENT OFFICE

2,317,496

PRINTING TELEGRAPH APPARATUS

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Application June 21, 1941, Serial No. 399,062
In Great Britain July 26, 1940

7 Claims. (Cl. 178—34)

The present invention relates to the control of escapement devices by means of electrical impulses and one of its objects is to enable an escapement device to be controlled by an electromagnet operated directly by received impulses and to reduce the work to be done by the electromagnet to a minimum.

According to the invention, an arrangement for controlling the operation of an escapement device by means of electrical impulses comprises a receiving electromagnet arranged to respond to said impulses and a mechanical relay device arranged to relay the movements of the armature of said electromagnet to said escapement device.

The invention is particularly applicable to printing telegraph apparatus of the step-by-step type and according to this feature, such apparatus includes means arranged to be driven from a power shaft under the control of an escapement device to which the movements of the armature of a receiving electromagnet are arranged to be relayed by a mechanical relay device.

An embodiment of the invention will now be described by way of the example, reference being made to the accompanying drawing which shows portion of a printing telegraph receiver of the step-by-step type according to the invention.

In the arrangement shown in the drawing, a typewheel 1 is mounted on a typewheel spindle 2 arranged to be rotated by gearing (not shown) driven by a coiled spring (not shown) maintained under tension either manually or by an electric motor. An escapement spindle 5 is driven from the typewheel spindle 2 via gearing 3, 4.

The escapement spindle 5 is normally prevented from rotating by means of corresponding two stop arms 6 and 7 carried by the escapement spindle 5 and arranged to engage two detent levers 8 and 9. The detent lever 8 is provided with three arms 10, 11, 12 and the detent lever 9 is similarly provided with three arms 13, 14, 15; the arms 10 and 13 serving to engage the stop arms 8 and 9. The second arm 12 of the detent lever 8 is connected by a link 16 to an arm 17 on one end of a rock-shaft 18, which carries at its other end an abutment lever 19 adapted to co-operate with an abutment 20 carried by the armature 21 of an electromagnet 22 which is arranged to receive incoming telegraphic signals transmitted by a step-by-step telegraph transmitter. The arm 15 carried by the other detent lever 9, is connected by a link 23 to an arm 24 carried on a second rock-shaft 25 carrying a second abutment lever 26 adapted to co-operate with the abutment 20.

The third arm 11 of the detent lever 8 is adapted to co-operate with corresponding resetting rollers 27, 28 carried by the stop arm 6. Similarly, the third arm 14 of the detent lever 9 is adapted to co-operate with corresponding resetting rollers 29, 30 carried by the stop arm 7. Each detent lever 8, 9 is acted on by a spring 31, 32, tending to withdraw the detent lever from engagement with its associated stop arm 6, 7. The stop arms 6, 7 and resetting rollers 27, 28, 29, 30 are so arranged that when one stop arm 6 or 7 is abutting against the arm 10 or 13 of the associated detents lever 8 or 9, the resetting roller (e. g. 29) associated with the third arm 14 or 11 of the other detent lever 9 or 8, is co-operating therewith to lift the abutment lever 26 or 19 clear of the upper end of the abutment 20 on the armature 21 of the electromagnet 22. At this instant, the abutment lever 19 or 26 associated with the other detent lever 9 or 8 is resting on the upper end of the abutment 20, thereby preventing the associated detent arm 10 or 13 from withdrawing from the associated stop arm 6 or 7.

The abutment 20 is free to move between two adjustable stops 33 and 34 in direct response to the incoming impulses. If the abutment 20 is in the position shown, the typewheel 1 will remain stationary in the position shown until the next impulse is received. When this occurs, the abutment 20 moves from under the abutment lever 19 to a position under the abutment lever 26. The abutment lever 19 is thereby released and permits the spring 31 to withdraw the detent arm 10 from engagement with the stop arm 6 thereby leaving the typewheel 1 free to rotate. During the rotation of the typewheel, the stop arms 6, 7 are driven via the step-up gearing 3, 4, thereby causing the resetting roller 29 to move clear of the arm 14 thereby permitting the spring 32 to rotate the detent lever 9 through a small angle to cause the end of the abutment lever 26 to fall onto the end of the abutment 20. Further rotation of the detent lever 9 is thus prevented so that the detent arm 13 is held in the path of the stop arm 7, so as to bring the typewheel 1 to rest after having moved through an angular distance corresponding to that between adjacent letters on the typewheel.

The rotation of the escapement spindle 5 also causes the resetting roller 27 to engage the arm 11 of the detent lever 8, so as to rotate the detent lever 8 in a clockwise direction to raise the free end of the abutment lever 19 above the level of

the end of the abutment 20. The abutment 20 is now free to move back to its first position in response to the next impulse when a similar cycle of operations to that already described will be performed.

The shock of stopping the rotating typewheel is taken by the detent levers 8, 9 and none of this shock is taken by the armature of the electromagnet. The force required to pull the detent arms 10, 13 out of engagement with the stop arms 6, 7, is small so that the springs 31, 32 may be fairly light. Only a small area of engagement is required between the abutment levers 19, 26 and the abutment so that the travel of the armature 21 can be reduced to a minimum, thereby reducing the amount of power required to operate it.

What is claimed is:

1. In a printing telegraph apparatus a rotary shaft, an escapement for controlling the rotation of said shaft comprising a pair of stop arms secured to said shaft, said stop arms being angularly displaced in respect to each other, a detent for each stop arm, means on each stop arm disposed to move with the rotation of the shaft the corresponding detent into the rotary path of the stop arm and to thereby stop said shaft, spring means individual to each detent tending to move said detents out of the path of said stop arms and thus release said shaft for rotation, and means comprising a relay for controlling the operation of said detents by said spring means.

2. In a printing telepgraph apparatus, a rotary shaft, an escapement for controlling the rotation of said shaft comprising a pair of stop arms angularly displaced from each other secured to said shaft, a detent for each stop arm, an abutment lever coupled to each detent so as to oscillate therewith, means on each stop arm disposed so as to move with the rotation of the shaft the associated detent into the rotary path of a stop arm and to thereby stop said shaft, spring means individual to each detent tending to move said detents out of the path of said stop arms and thus release said shaft for rotation, a line relay having an armature adapted to rest in either of two positions, an abutment on said armature adapted to be engaged in either of said positions by one of said abutment levers, said abutment being effective when said armature is at rest to prevent said spring means from moving said detents.

3. In a printing telegraph apparatus, a rotary shaft, an escapement for controlling the rotation of said shaft comprising a pair of stop arms angularly displaced from each other secured to said shaft, a detent comprising a plurality of arms for each stop arm, an abutment lever coupled to one arm of each detent so as to oscillate therewith, means on each stop arm disposed so as to move with the rotation of the shaft the associated detent into the rotary path of a stop arm and to thereby stop said shaft, spring means individual to each detent tending to move said detents out of the path of said stop arms and thus release said shaft for rotation, a line relay having an armature adapted to rest in either of two positions, an abutment on said armature adapted to be engaged in either of said positions by one of said abutment levers, said abutment being effective when said armature is at rest to prevent the oscillation of the abutment lever engaged thereby.

4. In a printing telegraph apparatus, a rotary shaft, an escapement for controlling the rotation of said shaft comprising a pair of stop arms angularly displaced from each other secured to said shaft, a detent for each stop arm, a pair of arms secured to each detent, a projection from each stop arm adapted during rotation of said shaft to engage one of the arms secured to the associated detent and move the detent into the path of the stop arms thereby stopping said shaft, spring means operable on said detents tending to move them from the path of said stop arms thereby releasing said shaft for rotation, a line relay comprising an armature, and mechanical means connected to an arm of each detent and controlled by said armature for controlling the effect of said spring means on said detents.

5. An escapement according to claim 4 in which each stop arm comprises a pair of stop members spaced 180° apart.

6. An escapement according to claim 4 in which each detent is rocked during the rotary movement of the shaft by a pair of projecting members carried by the stop arms, and in which the rocking motion of said detents is blocked by the armature when it moves from one position to another.

7. An escapement according to claim 4 in which said detents comprise trifurcated members, one arm of which serves as a detent, another which cooperates with the stop arm to restore the detent into the rotary path thereof, and the third being mechanically connected to an abutment lever.

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