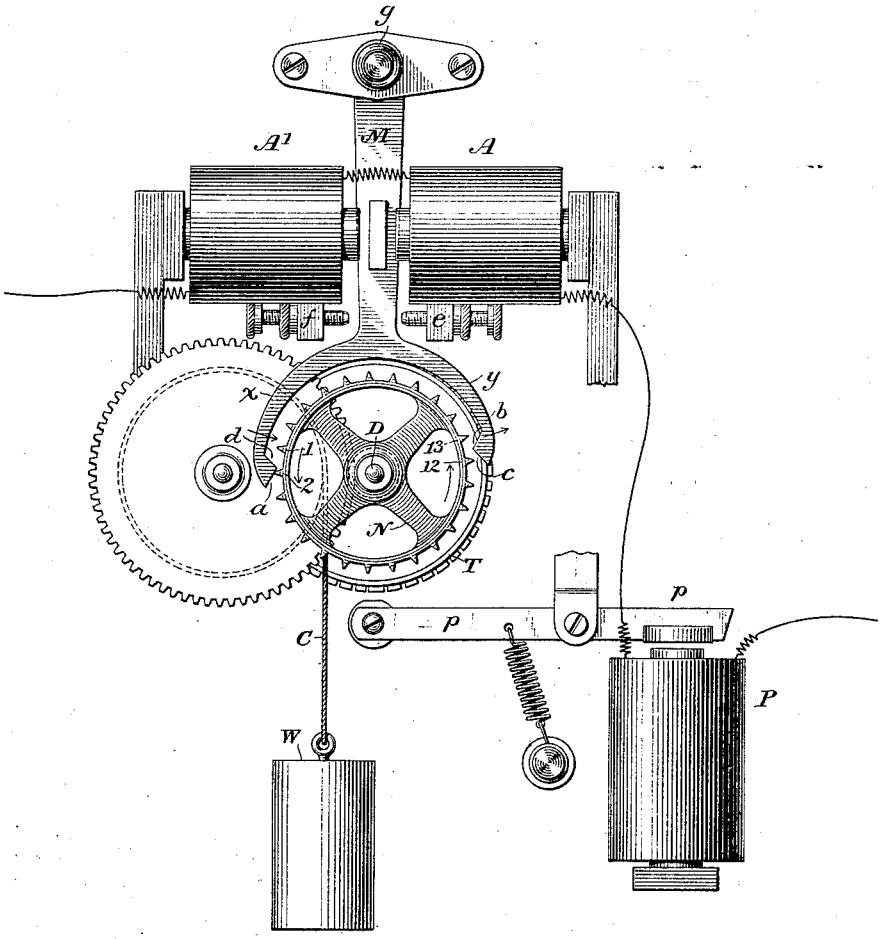
(No Model.)

D. B. SCOTT.

ESCAPEMENT FOR PRINTING TELEGRAPHS.

No. 303,327. Patented Aug. 12, 1884.



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ESCAPEMENT FOR PRINTING-TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 303,327, dated August 12, 1884.

Application filed January 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, D. BRYCE SCOTT, residing in the city of Brooklyn, county of Kings, and State of New York, a citizen of Canada, North America, have made a new and useful improvement relating to electro-magnetic escapement apparatus for controlling the rotation of type-wheels of printing-telegraph instruments, of which the following is a specification.

In escapement devices ordinarily employed for the rotation of type-wheels their release and step-by-step rotation are effected by a to-and-fro movement of the escapement-yoke through the agency of electro-magnets in a main line.

The object of my invention is to provide an escapement apparatus in which the to-and-fro movement of the escapement-yoke is effected, not by the escapement electro-magnets alone, but by the combined action of the motor which is usually employed to rotate the escapement-wheel when released and the escapement electro-magnets.

A further object of my invention is to so construct the pallets of the escapement-yoke that they may, in case the escapement-wheel should happen not to be readily rotated by its motor, have a positive driving capacity to rotate said escapement-wheel step by step. To this end I employ an escape-wheel having what are technically known as "recoil-teeth," or teeth whose faces form angles with the radial lines drawn from the points of the teeth to the center of motion. In connection with the recoil-teeth upon the escapement-wheel I employ an escapement-yoke the two pallets of which have double-inclined surfaces so arranged that in the rotation of the escapement-wheel any tooth thereon approaching a pallet of the escapement-yoke will strike upon the inclined surfaces thereof and tend to drive it to one side. At an obtuse angle with the first inclined surface of a pallet is a second inclined surface, whose position is such that on a reverse movement of the escapement-yoke a second inclined surface will impinge upon the next succeeding tooth of the escapement-wheel, providing in the meantime the escapement-wheel has not rotated a portion of a step under the influence of the motor, as it should have done, and by such impingement the pallet will act positively to drive the escapement-wheel through the space of one step of rotation. In the case of a dead-beat escapement, as distinguished from a recoil-escapement, the to-and-fro movement of the escapement-yoke is comparatively slow, as its inertia and the friction between its pallets and the teeth of the escapement-wheel must be wholly overcome by the electro-magnetic influence of the escapement-magnets, and in that case the force of the motor which tends to rotate the escapement-wheel increases bearing-pressure and the friction between the pallets of the escapement-yoke and the teeth of the escapement-wheel. In my arrangement, however, the recoil-teeth of the escapement-wheel and the inclined surfaces of the pallets of the escapement-yoke enable the action of the motor of itself to give the escapement-yoke a rapid to-and-fro vibration.

In the operation of printing-telegraph instruments it frequently occurs that after a strip of paper upon which the message is printed has been pressed against the characters of the type-wheel, said paper strip will not be quickly withdrawn. If an impulse to rotate the type-wheel be sent to line during a prolonged adherence of the paper strip to the type-wheel, the type-wheel will be arrested while it should have taken one or more steps of rotation, thereby throwing it out of unison. This defect in operation is very common where dead-beat escapements are employed. My device, however, affords means for positively driving the type-wheel at each to-and-fro rotation of the escapement-pallets whether the action of the motor is or is not sufficient to cause rotation. I first, therefore, give the weight or clock motor a capacity for accelerating the to-and-fro vibrations of the escapement-yoke; and, secondly, I give the escapement-pallets a capacity for assisting the clock or weight motor in the operation of rotating the type-wheels.

I will now describe my invention by reference to the accompanying drawings.

N is an escapement-wheel having recoil-teeth 1 2 12 13.

T is a type-wheel, which is rigidly connected with escapement-wheel N upon shaft D, to

which a constant tendency to rotation is imparted by the weight W, cord C, and an interposed gear-train.

M is an escapement-yoke pivoted at *g*, having pallets *x y* and adjustable set-screws *e f*, for limiting its to-and-fro movement.

A A′ are escapement electro-magnets for controlling the vibration of escapement-yoke M.

P is a press-magnet controlling an armature-lever, *p p*, to which is attached a platen for impressing a strip of paper upon the characters upon the periphery of the type-wheel. Pallet *x* is provided with two inclided surfaces, *a d*, and pallet *y* with corresponding inclined surfaces, *b c*. In the normal rotation of the escapement-wheel, if the escapement-yoke had moved to its extreme left position, the point of tooth 2 would have passed by the point of pallet *x*, and thereupon the point of tooth 12, through the agency of the motor, impelled by weight W, would be immediately thrown against the inclined surface *c* of pallet *y*. The impinging of tooth 12 upon surface *c* would conspire with electro-magnets A A′ to immediately move the escapement-yoke from its extreme left position toward the right, and the escapement-wheel would continue to rotate until the point of tooth 12 had passed the point of pallet *y*. Upon the point of 12 passing the point of pallet *y* the escapement-wheel again has a second free movement of rotation under the action of the clock-motor until the point of tooth 1 comes in contact with the inclined surface *d* of pallet *x*. However, if after the escapement-yoke has reached its extreme left position, the rotation of the escapement-wheel under the influence of the motor be arrested by a failure to withdraw the paper from the periphery of the type-wheel, the reverse movement of the escapement-yoke toward the right will bring the inclined surface *a* of pallet *x* against the point of tooth 2, and will thereby positively drive the escapement-wheel N until the point of tooth 12 is just past the point of pallet *y*. If the type-wheel again fail to rotate under the action of the motor, the reverse movement of the escapement-pallets to the left will bring the inclined surface of *d* to bear upon the point of tooth 12, and the escapement-wheel will be positively driven another step, and so on. The type-wheel is held during an impression by a prolonged impulse of either polarity.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of an escapement-wheel for printing-telegraphs having recoil-teeth, with double-inclined surfaces, as set forth, and escapement-pallets provided with double-inclined surfaces, substantially as described.

2. The combination of an escapement-wheel having recoil-teeth, and a clock or other motor for driving the same, and inclined surfaces upon the escapement-pallets, substantially as described, for aiding said motor to rotate the escapement-wheel.

3. The combination of a type-wheel, an escapement-wheel having recoil-teeth, and a motor for driving the same, an escapement-yoke having pallets provided with inclined surfaces, substantially as described, for enabling the motor which drives said escapement-wheel to accelerate the vibrations of the escapement-yoke, and electro-magnets for controlling said vibration.

4. The combination of an escapement-wheel and a motor for rotating the same, an escapement-yoke controlled by electro-magnetism, said yoke being provided with pallets having inclined surfaces, substantially as described, for positively aiding the motor to rotate said escapement-wheel.

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