

G. A. ARNOLD.
TELEGRAPHIC TAPE PERFORATOR.
APPLICATION FILED DEC. 20, 1910.

1,035,405.

Patented Aug. 13, 1912.
5 SHEETS—SHEET 1.

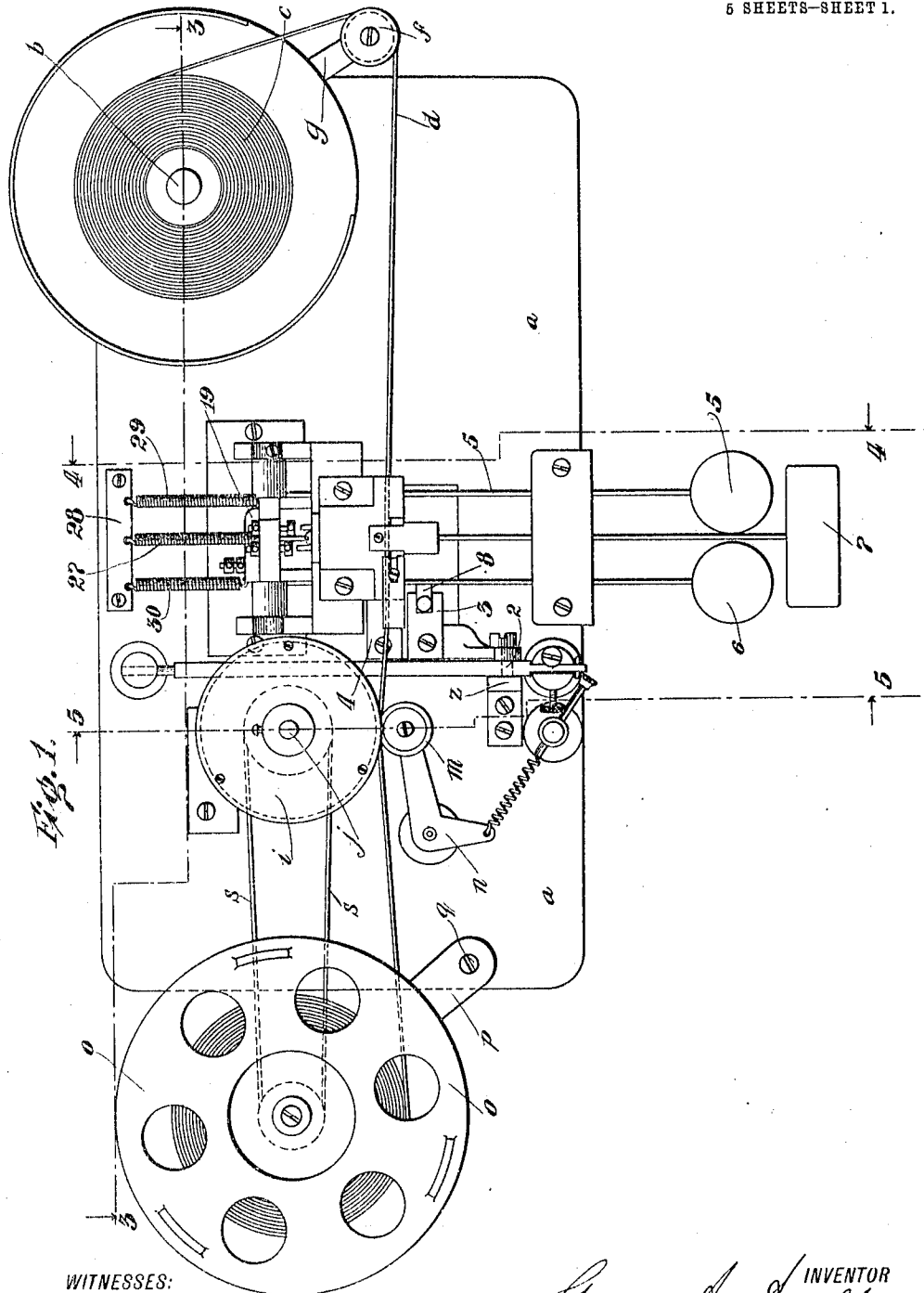


Fig. 1.

WITNESSES:

C. S. Ashley
Mary Dutton.

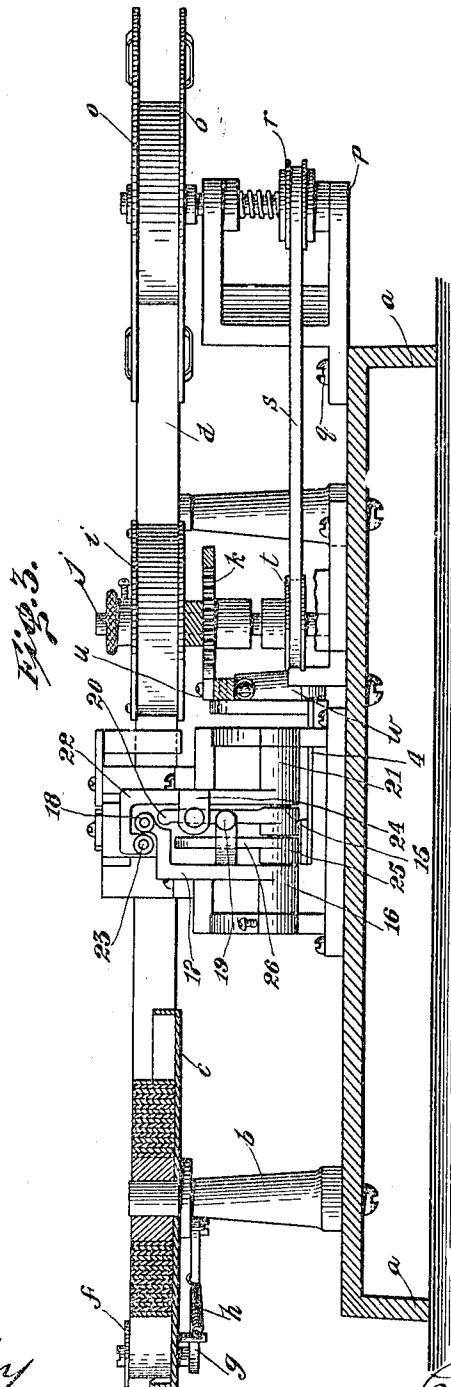
George A. Arnold INVENTOR
Edward C. Davidson BY
ATTORNEY

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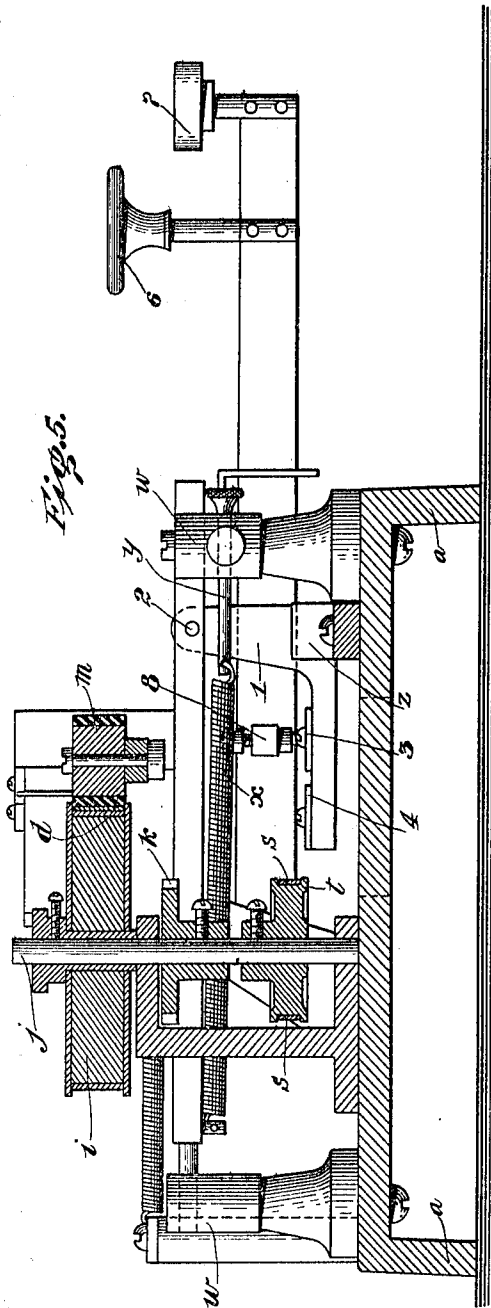
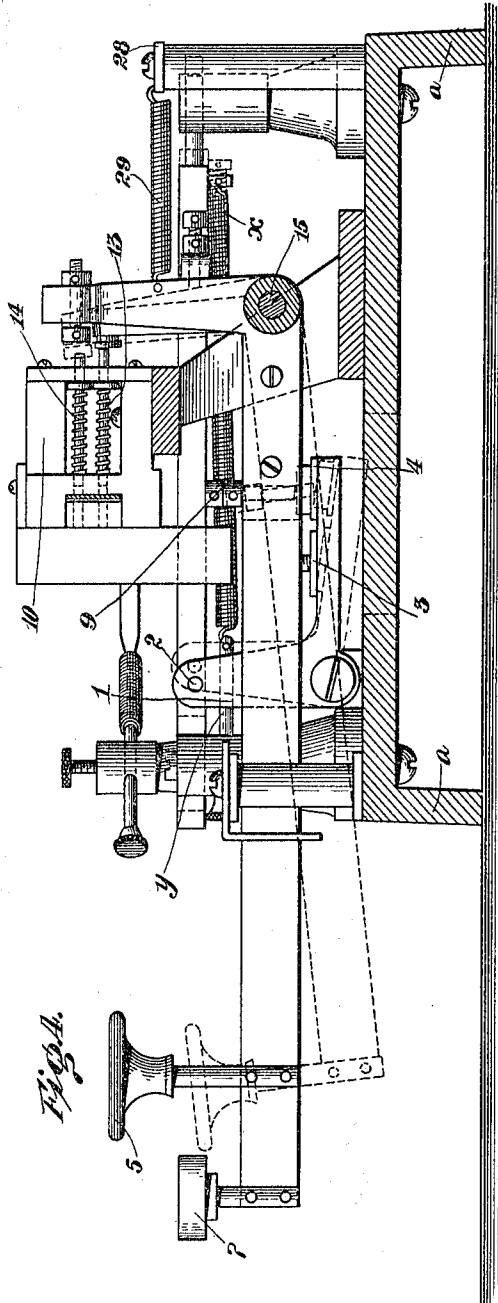
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6 SHEETS—SHEET 5.

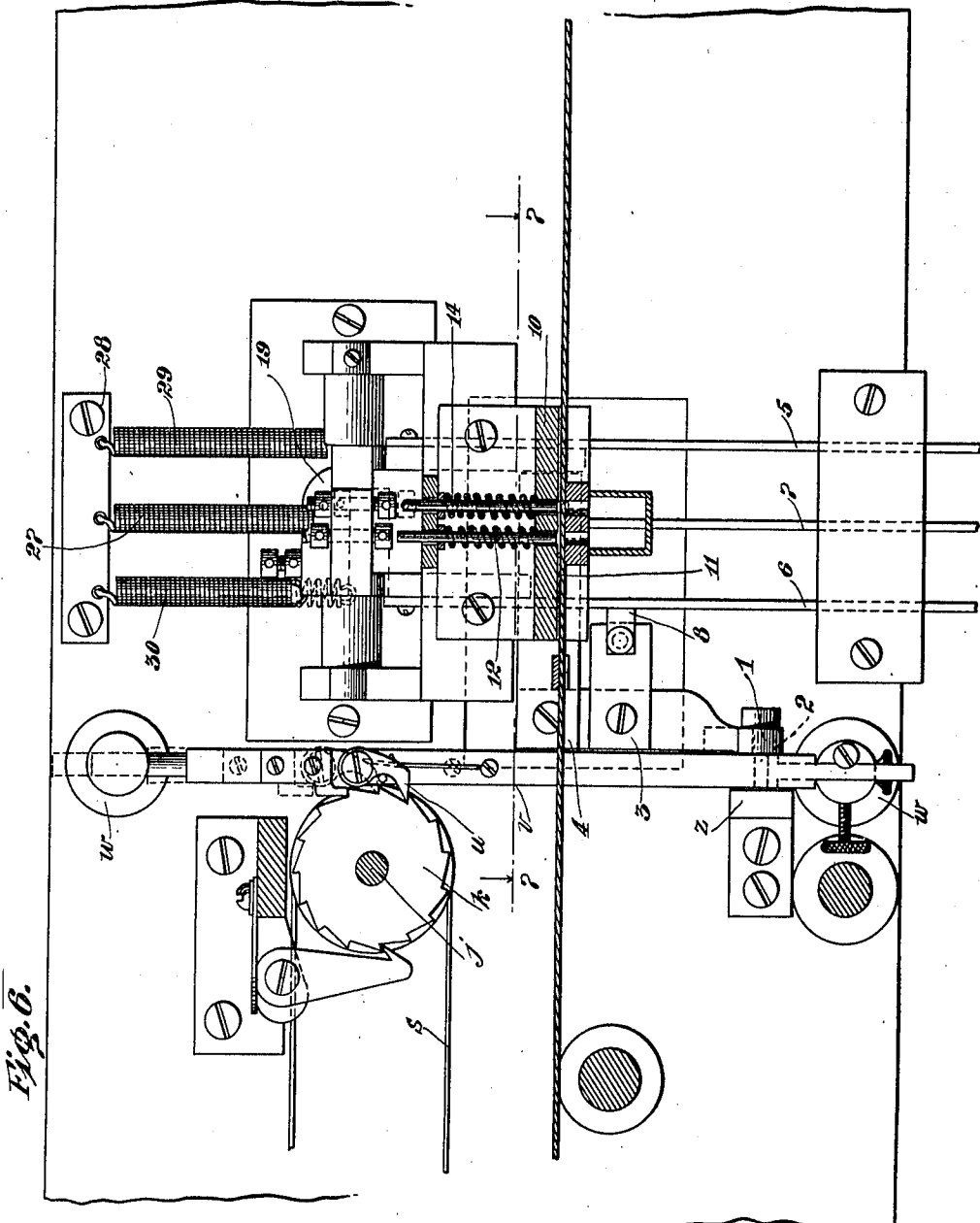


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE A. ARNOLD, OF NEW YORK, N. Y., ASSIGNOR TO TELEPOST COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

TELEGRAPHIC-TAPE PERFORATOR.

1,035,405.

Specification of Letters Patent.

Patented Aug. 13, 1912.

Application filed December 20, 1910. Serial No. 598,322.

To all whom it may concern:

Be it known that I, GEORGE A. ARNOLD, a citizen of the United States of America, residing in the borough of Manhattan, city, county, and State of New York, have invented a certain new and useful Improvement in Telegraphic-Tape Perforators, of which the following is a specification.

This invention relates to a perforator for forming dot and dash characters in the transmitting tape of an automatic telegraph system, such as that of the Delany operated by the Telepost Company. In that system as it is practised a dot is represented by two perforations in a tape in a line perpendicular thereto, and a dash by two perforations in a line oblique to the tape.

The instrument comprising the subject matter of this invention is provided with two punches in a line perpendicular to the traverse of the tape and a third punch along side of the other two. There are two character keys and a space key. The organization is such that when the dot key is depressed, the two punches in a line perpendicular to the tape are actuated to produce two perforations in the tape that will, of course, be in a line perpendicular to its length. When the dash key is depressed, one of the first named punches and the third named punch will be actuated to thereby produce in the tape two perforations in a line oblique to the tape. After the record on the tape of either a dot or dash character and when the space key is depressed, the tape is fed. In an apparatus of this kind, it is obvious that the feed of the tape should be greater after the formation of a dash signal than after the formation of a dot signal. The apparatus is so constructed that the feed effected when the space key is operated is the same as that which occurs when the dot key is operated.

The primary feature of this invention resides in the association of variable feed mechanism with the described arrangement of punches and operating dot and dash keys.

In the accompanying drawing: Figure 1 is a plan view: Fig. 2, a side elevation: Fig. 3, a section on the line 3, 3, of Fig. 1: Fig. 4, a transverse section on the line 4, 4, of Fig. 1: Fig. 5, a transverse section on the

line 5, 5, of Fig. 1: Fig. 6, a horizontal section on the line 6, 6, of Fig. 2: and Fig. 7 a detail horizontal sectional view on the line 7, 7, of Fig. 6 showing the way in which the punches are arranged or grouped.

On the base *a* is a standard *b* that carries a supply reel *c* from which the tape *d* extends around an idler *f* in the end of a horizontal pivoted arm *g* to which is applied a coiled spring *h* which the strain of the tape tends to extend or place under tension. From this idler, the tape passes through the slot or guide way of the punching devices between feed rolls one of which *i* is on a vertical shaft *j* driving the ratchet wheel *k*. The cooperating roll *m* is an idler carried in the arm of an elbow lever *n* to which is applied a coiled spring whose reaction tends to press the roller *m* against the periphery of roller *i*. From these feed rolls, the tape *d* passes to a receiving reel *o*, the vertical spindle of which has bearings in a swinging bracket *p* pivoted at *q* on the bed plate. This spindle has frictionally connected with it through the medium of its spring and a washer, a driving pulley *r* carrying a belt *s* that runs around a pulley *t* fast on the vertical shaft *j* of the driving ratchet wheel *k*. The tightening of the belt *s* is effected by swinging the bracket *p* and fastening it by means of the pivot screw *g*. The tape feed drive ratchet wheel *k* is driven by a spring pressed drive pawl *u* pivoted on the upper face of a rod *v* sliding in ways in posts *w*, *w*, and having applied to it a coiled reaction spring *x* attached at its rear end to a projection extending down from the slide rod and at its front end to an adjustable screw rod *y* extending through the front post *w*. When different extents of movement are imparted to this slide rod the drive pawl may be carried over one or two or more teeth of the ratchet wheel so that the reaction of the spring *x* will drive the ratchet wheel and consequently the paper engaging feed roll *i* through an arc equal to one or two or more teeth of the ratchet wheel. This variable extent of movement may be imparted to the slide rod as follows. Pivoted in ears *z* on the bed plate is a bell crank lever *1* whose upright arm is connected with the slide rod at 2. Its horizontally

rearwardly extending arm carries two laterally extending plates 3, 4. The one 3 is nearest the pivot of the bell crank and the one 4 is farthest from the pivot and has a greater lateral extension. The arrangement is such that when the shorter plate 3 nearest the axis is depressed a given distance, the upright arm of the bell crank will be moved through such an arc as to carry the slide rod rearwardly such a distance as to pass over two of the teeth of the drive ratchet wheel; and, therefore, on release of the key a partial rotation of the drive wheel $\dot{z}$ equal to the movement of the ratchet wheel through the space of two teeth will impart a given feed to the paper strip which, in this instance, will be the maximum feed. When the plate 4 is depressed through approximately the same distance, the slide rod will be actuated so that the drive pawl thereon will pass over but one of the teeth of the ratchet wheel and consequently a smaller extent of movement will be imparted to the paper feed wheel $\dot{z}$. The plates 3, 4, are engaged by dot, dash and space keys. 5 is the dot key, 6, the dash key and 7 the space key. When the dash key 6 is depressed one of the two punches that are in line perpendicular to the tape and also the third punch will be operated as hereinafter described; and, at the same time, an adjustable screw in a lateral projection 8 on the key comes in contact with the laterally projecting plate 3 of the bell crank lever 1 and the slide rod is moved rearwardly so that the drive pawl u passes over two ratchet teeth thereof and the paper feed wheel $\dot{z}$ is fed by reaction of spring x through an arc equal to two teeth when the dash key is raised. When the dot key 5 is depressed, the lateral projection 9 thereon, provided with an adjustable screw that bears upon laterally projecting plate 4, depresses that plate and consequently rocks the bell crank lever. The power being now applied farthest from the axis of the bell crank lever the slide rod is moved rearwardly a space only sufficient to take in one tooth of the ratchet wheel. When the space key 7 is depressed, it acts upon the lateral plate 4 which it overlies and serves to actuate the slide rod through the same distance that it is moved when the dot key is depressed. 10 is the die block having the usual slot, groove or guide way 11 for the traverse of the tape. 12 and 13 are the two punches arranged in a line perpendicular to the tape and 14 is the punch arranged alongside of one of the first mentioned punches.

The three keys 5, 6 and 7 are pivoted upon a common rod 15. The dot key 5 is formed with a hub 16 embracing the pivot rod and from which there extends upwardly an arm 17 whose upper end projects laterally and is

provided with an adjustable screw head 18 that stands opposite the rear end of the upper one of the pair of punches that are in a line perpendicular to the tape. The arm 17 has, intermediate its ends, the laterally projecting arm 19 having a screw adjustable head that stands in rear of an arm 20 rocking on the shaft 15 whose upper end has an adjustable screw head that stands opposite the lower one of the pair of punches that is arranged in a line perpendicular to the tapes. Consequently, when the dot key is depressed, the parts 18 and 20 act simultaneously upon said pair of punches and produce two perforations in the tape in lines perpendicular thereto. The dash key has a hub 21 from which there extends upwardly an arm 22 whose upper end extends laterally and terminates in an adjustable screw head 23 that stands back of the third punch which, as viewed from the rear of the machine, is to the left of, and in line with, the upper one of the pair of punches that are in a line perpendicular to the tape. This arm 22 has also, intermediate its ends, a lateral projection 24 in the end of which is an adjustable screw head that stands back of the rocker arm 20 and consequently when the dash key is depressed, two punches are operated, *i. e.* the lower one of the two punches that are in a line perpendicular to the tape and the third punch referred to; and therefore two perforations will be formed in the tape in a line oblique thereto. The space key is also formed with a hub 25 that embraces the shaft 15 and has an upwardly extending arm 26 which serves, however, merely for the connection of a coiled spring 27 whose rear end is connected to a fixed plate 28 to which also are connected the rear ends of springs 29 and 30 applied respectively to the upright arm 17 of the dot key and the upright arm 22 of the dash key.

I claim:

1. A telegraphic tape perforator comprising two punches arranged in line perpendicular to the traverse of the tape and a third punch to one side of one of the said two punches, a dot key, a dash key and a space key, means whereby when the dot key is actuated, the two punches in a line perpendicular to the tape are operated, means whereby when the dash key is actuated one of said two punches and also the third punch are operated, paper feed devices and means whereby, after the dot key is actuated, the tape is fed a given distance and means whereby after the dash key is operated, the tape is fed a given greater distance and means whereby the tape is fed when the space key is operated.

2. Telegraphic tape perforating apparatus comprising the combination of a paper feed ratchet wheel, a slide rod, a ratchet drive dog pivoted on the slide rod, a bell crank

5 lever operatively connected to the slide rod, punches, dot and dash keys, punch operated devices actuated by the dot and dash keys, means whereby when the dot key is operated, the bell crank lever is operated upon to move the slide rod through one extent of movement and means whereby when the dash key is operated, the bell crank lever is

actuated to move the slide rod through a greater distance. 10

In testimony whereof, I have hereunto subscribed my name.

GEORGE A. ARNOLD.

Witnesses:

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CHAS. E. PERKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."