

June 14, 1927.

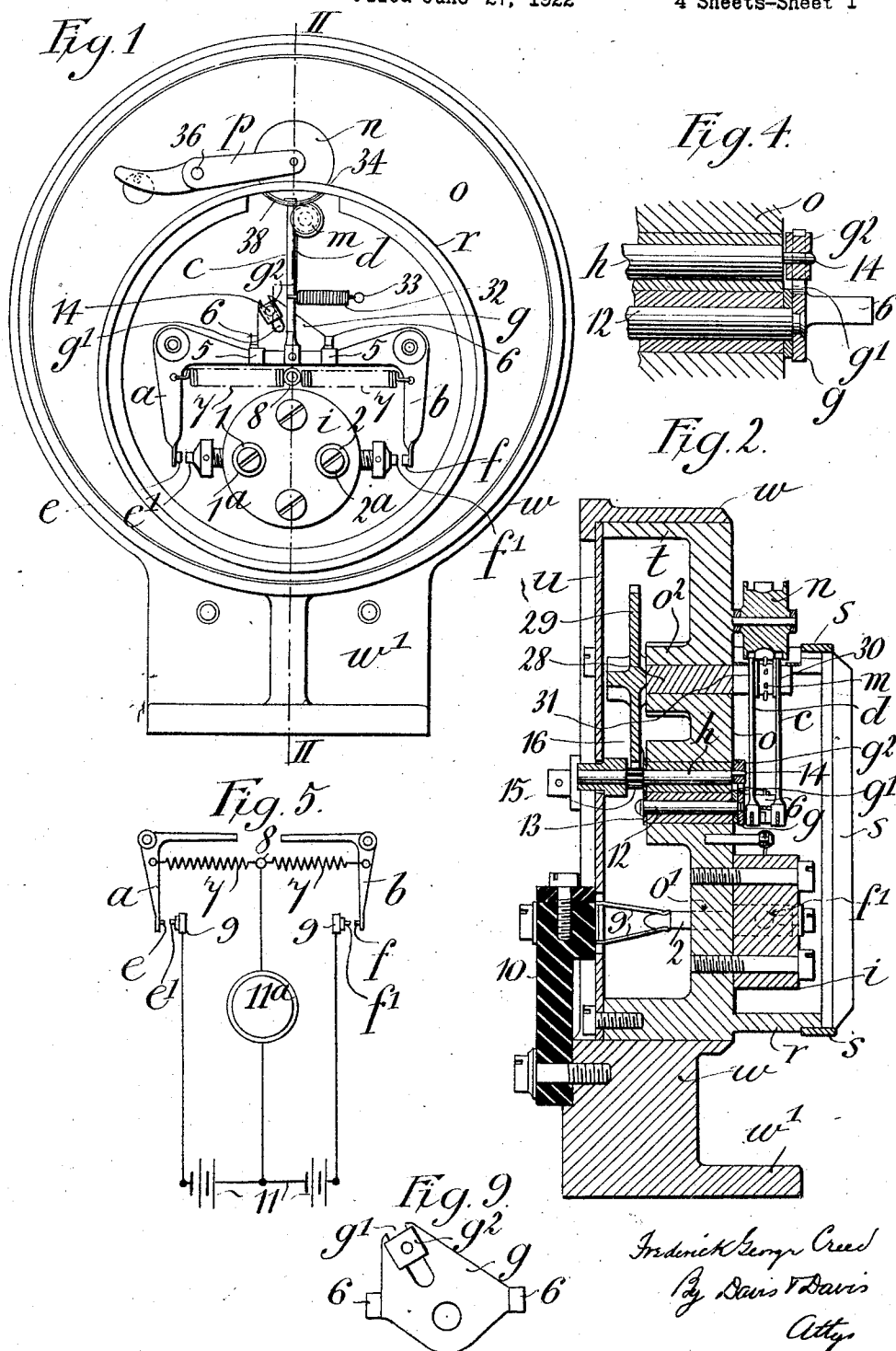
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ELECTRIC TRANSMITTER FOR USE IN AUTOMATIC TELEGRAPHY

Filed June 27, 1922

4 Sheets-Sheet 1



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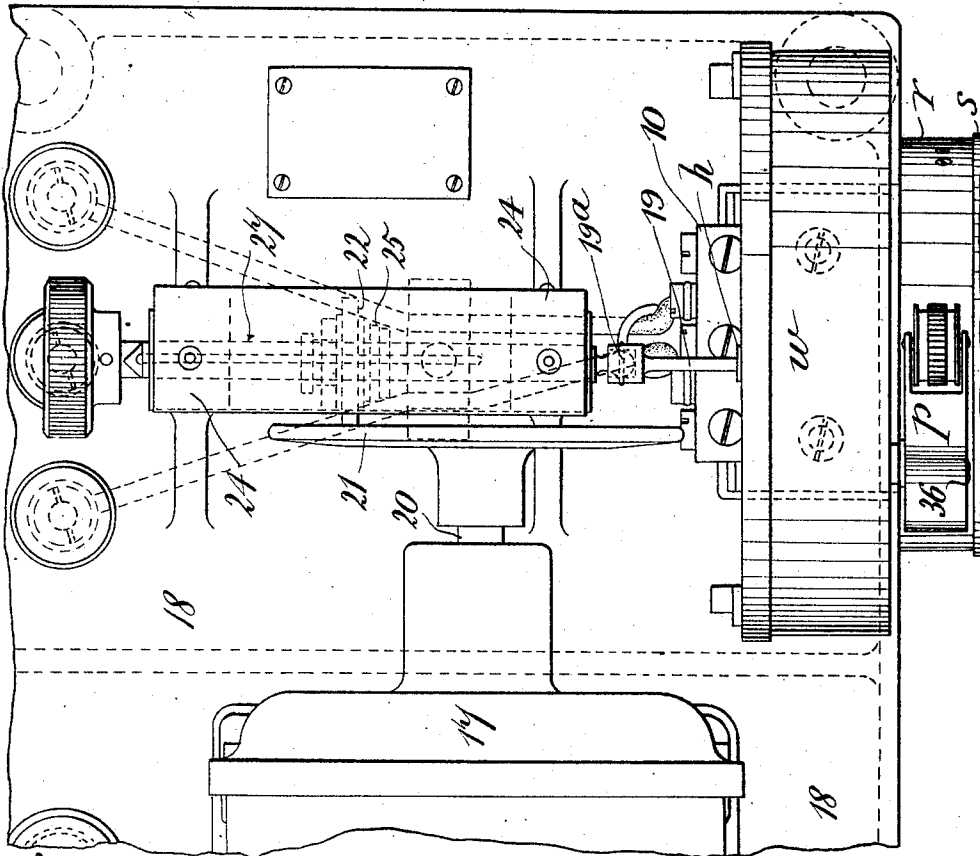


Fig. 8

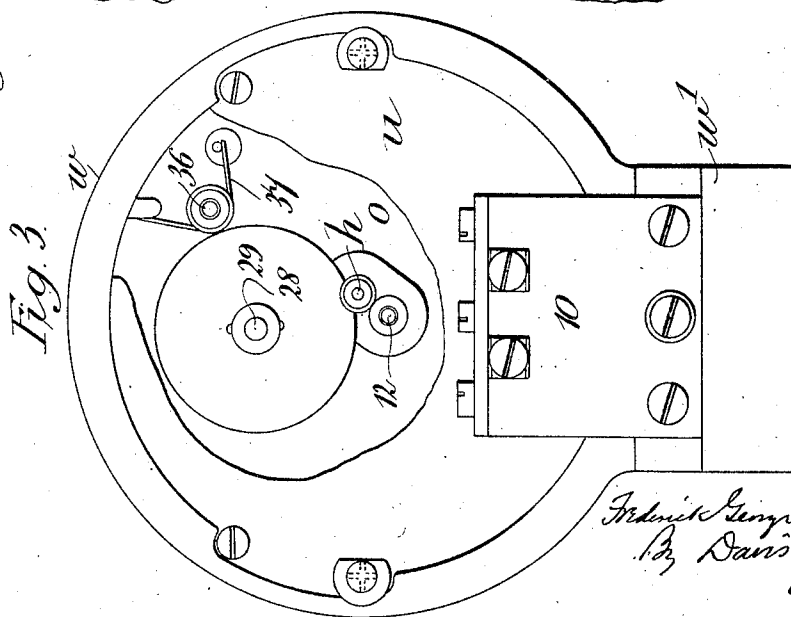


Fig. 3

Frederick George Creed
By Davis & Davis
Attys

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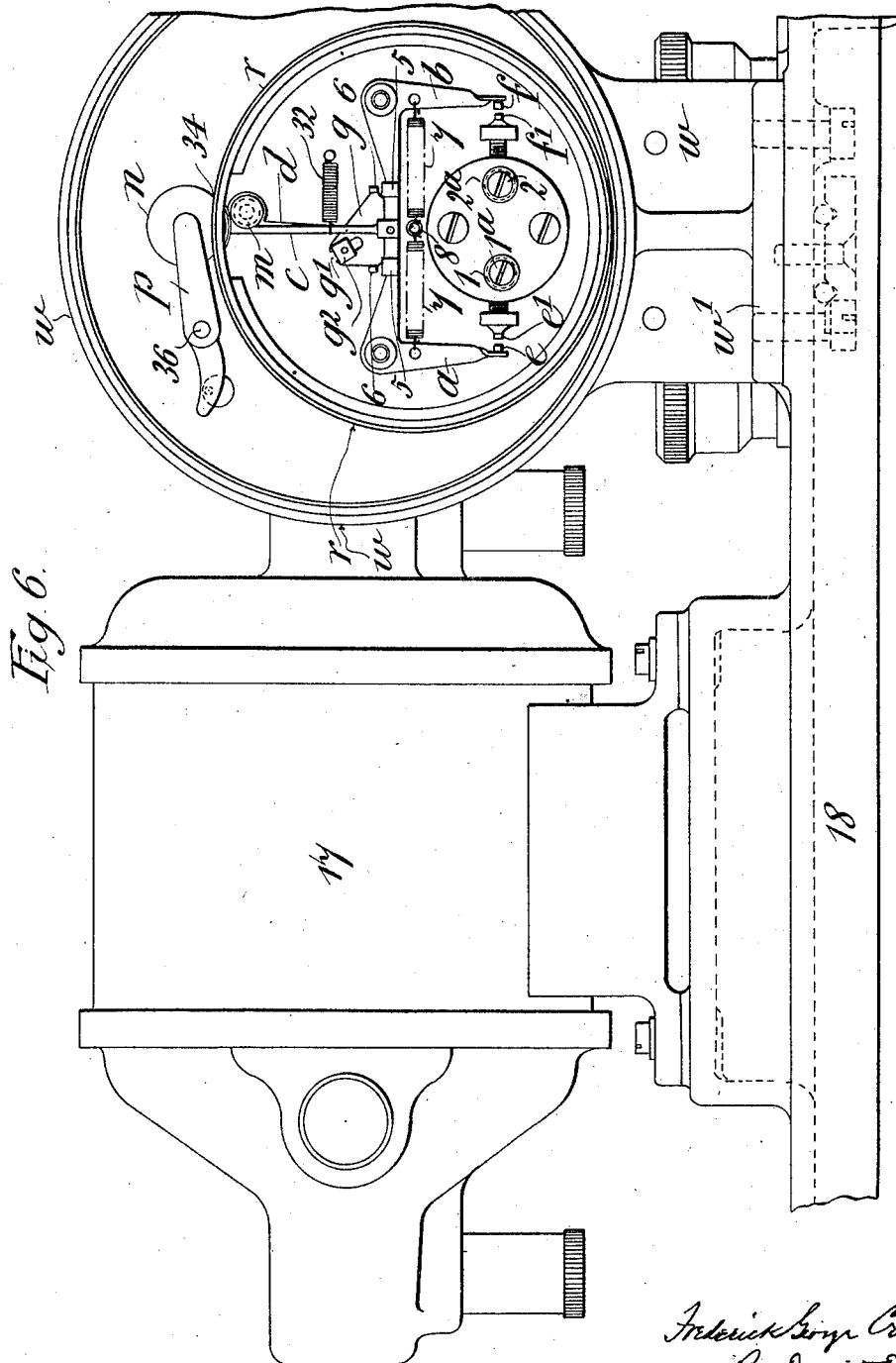
F. G. CREED

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ELECTRIC TRANSMITTER FOR USE IN AUTOMATIC TELEGRAPHY

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4 Sheets-Sheet 3



Frederick Beyer Crest
By Davis & Davis
Attys

June 14, 1927.

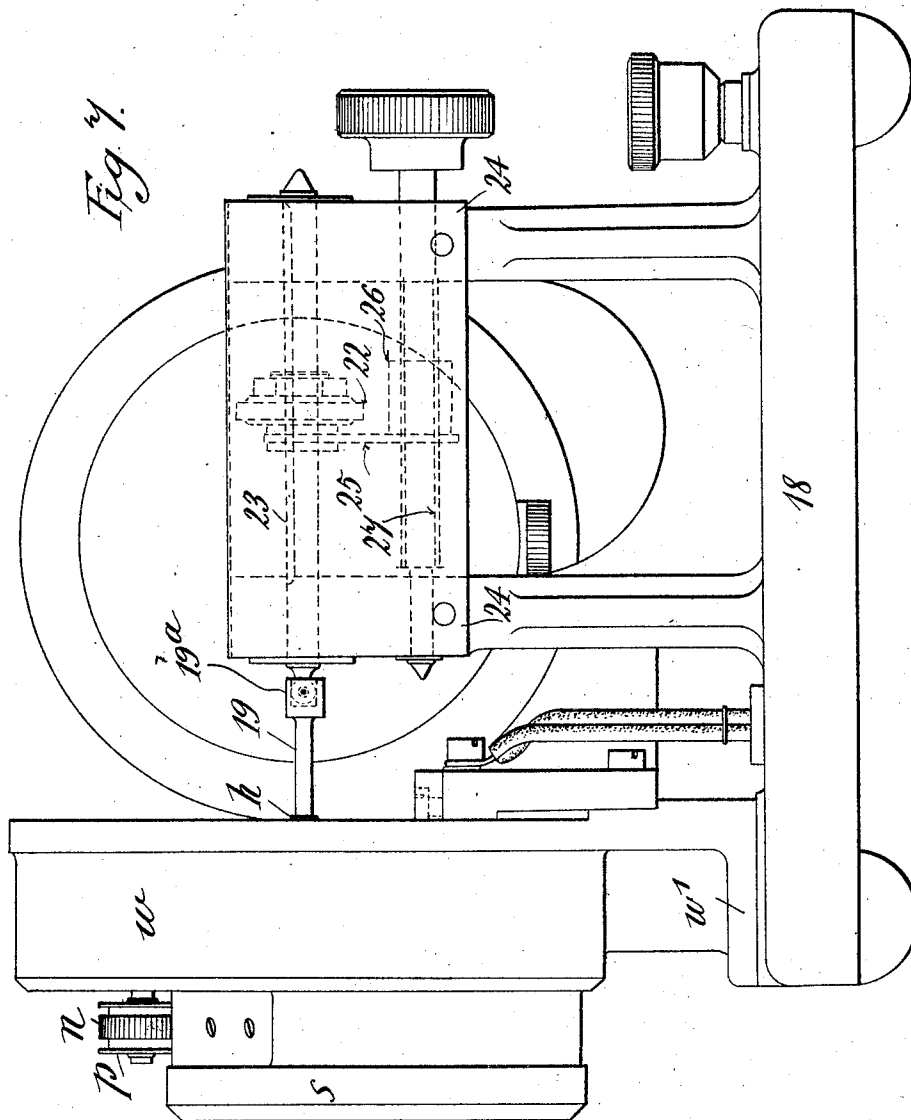
F. G. CREED

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ELECTRIC TRANSMITTER FOR USE IN AUTOMATIC TELEGRAPHY

Filed June 27, 1922

4 Sheets-Sheet 4



Frederick Henry Cond
By David Davis
Atty.

UNITED STATES PATENT OFFICE.

FREDERICK GEORGE CREED, OF CROYDON, ENGLAND.

ELECTRIC TRANSMITTER FOR USE IN AUTOMATIC TELEGRAPHY.

Application filed June 27, 1922, Serial No. 571,262, and in Great Britain August 16, 1921.

This invention has reference to electric transmitters of the type used with punched tape in automatic telegraphy for transmitting electric signals according to the Wheatstone, Morse or other system and it has for its object to simplify and facilitate the construction and improve the working of such transmitters and to avoid any need for adjustment of parts thereof after they have been made and set up for use.

For this purpose in an electric transmitter according to the present invention, the spring controlled bell crank levers carrying the peckers, carry movable contacts arranged directly to co-act in alternate order with stationary contacts for connection with the transmitting circuit. Such stationary contacts may advantageously be arranged between and co-axial with the movable contacts. In this way the number of parts necessary for effecting, breaking and reversing the electrical connections to the transmitting line is considerably reduced and the number of parts requiring adjustment considerably lessened, as compared with known transmitters of the Wheatstone type.

To maintain the peckers carried by the spring controlled bell crank levers in their proper upright positions in relation to the perforated tape, the feed wheel is formed with two parallel annular grooves against the inner ends or bottoms of which the peckers are caused constantly to bear by springs.

Also, with the object mentioned, the spring controlled bell crank levers carrying the peckers and movable contacts, the stationary contacts, the rocker beam for operating the levers, the driving spindle, the tape feed wheel, the jockey pulley for use therewith and the gearing between the driving spindle and feed wheel, used in electric transmitters of the kind referred to, are mounted on a vertical supporting plate to form a unit adapted to be inserted in a supporting frame or standard provided with a base or foot piece.

The driving spindle of the transmitter may advantageously be driven from an electric motor through variable speed gear of the friction type comprising two friction discs arranged at right angles to one another and one of which is adapted to be traversed in a radial direction across the face of the other. By this means the speed of the transmitter can be easily and accurately varied in a noiseless manner.

In the accompanying illustrative drawings, Fig. 1 is a front elevation, Fig. 2 a central vertical section on the line II—II of Fig. 1 and Fig. 3 a rear elevation of an electric transmitter constructed according to the invention. Fig. 4 is a detail view to a larger scale. Fig. 5 is a diagram. Figs. 6 and 7 are respectively front and side elevations and Fig. 8 a plan, showing the electric transmitter combined with a motor to form a complete transmitting unit. Fig. 9 is a detail view.

a and *b* are the spring controlled bell crank levers carrying the peckers *c* and *d* and movable contacts *e* and *f*; *g* the rocker beam for oscillating such bell crank levers; *h* the driving spindle, *i* a support for fixed insulated contacts *e*¹ and *f*¹ designed to co-operate with the said movable contacts *e* and *f*; *m* the tape feed wheel and *n* the jockey pulley for retaining punched tape in position in relation to the feed wheel, these parts being mounted at the front side of a single vertical supporting plate *o* that is adapted to serve as a bearing plate for the driving spindle *h* and for the pivot pins or spindles for the levers, the rocker beam, feed wheel and the lever *p* carrying the jockey pulley *n*. All of the foregoing movable parts, except it may be the jockey pulley, are preferably confined within a surrounding casing *r* carried by the vertical plate *o* and arranged at the front side thereof and which may be provided with a cover *s* having a glass front. The pivot pins and spindles extend through the vertical supporting plate *o* to the rear side thereof which is provided with a casing *t* and cover *u* enclosing the rearwardly extending ends of the pivot pins and spindles and also the gearing connecting the driving spindle and feed wheel spindle. The front and rear casings *r* and *t*, except their covers, may advantageously be made integral with the vertical supporting plate *o* and are preferably cylindrical in shape, this shape making for cheapness in manufacture and convenience in mounting. The combined parts are adapted to be pushed endways into and fixed in position for use, within a supporting frame or standard *w* provided with a base or foot piece *w*¹. The insulated fixed contacts *e*¹, *f*¹ may advantageously be connected respectively to pins 1 and 2 extending from the support *i* therefor at the front of the vertical plate *o*, through an opening *o*¹ in that plate in such

manner that they will be caused to bear respectively against spring contacts carried by the frame or standard *w*, when the vertical supporting plate *o* with attached parts is passed endways into position in such frame or standard. The several parts of the transmitter described can be variously constructed.

Thus, in the example shown, the horizontal arm of each pivoted bell crank lever *a* and *b* has secured thereto, for instance by sweating, a hardened steel pin 5 against which a corresponding tappet 6 on the rocker beam *g* acts intermittently so as to depress such pin against the action of a coiled spring 7 connecting the downwardly extending arm of the lever to a fixed pin 8. Each of the movable contact pins *e* and *f* is shown as permanently fixed to the depending arm of the corresponding bell crank lever. The two stationary contacts *e*¹ and *f*¹ for use with the two movable contact pins *e* and *f* are constituted by horizontal screws carried by the support *i* which consists of a circular block of insulating material fixed to the front side of the plate *o* and carries the two transverse metal pins 1 and 2. These pins are arranged with their axes in a common horizontal plane and extend through the plate *o* and bear against two independent contacts only one of which is shown in the drawing, namely at 9, in Fig. 2. Each of them is in the form of a pair of metal spring blades carried by a block 10 of insulating material fixed to the frame or standard *w*. The two pairs of spring blade contacts 9 extend through the cover *u* and are thus protected thereby.

The pins 1 and 2 have enlarged front end portions fixed in the circular insulating support *i*. The two screws constituting the stationary horizontal contacts *e*¹ and *f*¹, may be screwed into the enlarged ends of the two pins 1 and 2, so that they can be adjusted horizontally in relation to the movable contacts *e* and *f*, and be fixed in the said pins by clamp screws 1^a, 2^a passing through washers bearing against the front of the insulating block *i* and taking into the two pins 1 and 2 so that when tightened up the contact screws are clamped between the contact pin 1 or 2, and the insulating block *i*.

In the example shown, the stationary contacts *f*¹ and *e*¹ are designed to be connected through the insulated contacts 9 to the positive and negative poles respectively of a split electric battery 11, as shown in Fig. 5, whilst the movable contacts *e* and *f* are designed to be connected through the bell crank levers *a* and *b*, springs 7 and pin 8 to one terminal of a telegraph relay 11^a the other terminal of which is connected to the middle point of the split battery 11, the relay acting to control the supply of current from an

independent battery to a line wire. The electrical connections can however, obviously, be varied. Thus, the stationary contacts may be connected as described to the positive and negative poles of a split battery the middle point of which is connected direct to a line wire, whilst the movable contacts *e* and *f* are connected to earth. Or the movable contacts *e* and *f* may be insulated from the bell crank levers and connected, as through light flexible wires and other connections to a line wire, the central portion of the battery being connected to earth.

The rocker beam *g* may, as shown, be formed of a metal plate fixed to the forward end of a supporting pin 12, and provided with a pair of forwardly bent extensions or tappets 6 arranged to act alternately on the hardened pins 5 carried by the bell crank levers *a* and *b*. The pin 12 extends through a bearing in the vertical plate *o* and is retained in position endways, as by a split ring or collar 13. The said plate *g* is provided with an open ended inclined slot *g*¹ (Fig. 9) fitted with a sliding transverse block *g*² into which extends a rotary eccentric pin 14 formed on the front end of the driving spindle *h*. This spindle extends through a bearing in the vertical supporting plate *o* and is provided at the rear side of such plate, with a toothed pinion 15. It is held endways in position in the plate conveniently by a split ring or collar 16, encircling its rear end and located, between the pinion and the plate. The toothed pinion 15 is adapted to be driven from a suitable motor, for instance an electric motor 17 (Figs. 6, 7 and 8). This motor may, as shown, advantageously be mounted on a corresponding bed plate 18 in such a way that when the vertical plate *o* with associated parts is pushed into the frame or standard *w*, the driving spindle *h* of the transmitter will become automatically connected to a spindle 19 driven by the motor, it may be through a spring coupling, or, as shown, through a flexible joint at 19^a. The spindles *h* and 19 may advantageously be driven from the main driving shaft 20 of the motor through variable speed friction gearing comprising a friction disc 21 fixed on the main driving shaft 20 and a friction disc 22 mounted to turn with and to slide endways upon a secondary shaft 23 coupled to the spindle 19. The shaft 23 is mounted in a standard 24 on the base plate 18 and the friction disc 22 is arranged to be moved along the said shaft by the forked extremity of a bar 25 carried by a nut 26 mounted on a screw spindle 27, also carried by the standard 24, and capable of being turned by hand but not of moving endways so that by adjustment of the position of the friction disc 22 in relation to the centre of the friction disc 21, the speed of the driving shaft *h* of

the transmitter can be readily varied to suit requirement. The adjacent ends of the spindles *h* and 19 may be halved to enable the one to be readily placed in driving connection with the other. Or the motor may be arranged away from the transmitter, and its driving spindle be connected to that of the transmitter through flexible shafting. Also, regulation of the speed of the transmitter may be effected by regulating the speed of the motor and dispensing with variable speed gear.

The tape feed wheel *m* is located near the top of the front casing *r* carried by the vertical supporting plate *o* and is fixed to a spindle 28 that extends through that plate and a rear bearing extension *o*² of such plate and has fixed to its rear end a toothed wheel 29 in gear with the pinion 16 on the driving spindle *h* of the transmitter.

To maintain the peckers *c* and *d* carried by the bell crank levers *a* and *b* in their proper upright positions in relation to the perforated tape, the feed wheel *m* is formed with two parallel annular grooves at 30 and 31 against the inner ends of which the peckers are caused constantly to bear by separate coiled springs 32 connected to them and to the vertical plate *o* at 33. The grooved jockey pulley *n* for use with the feed wheel *m* and peckers *c* and *d* extends through an opening at 34 in the adjacent casing *s* and is carried by one arm of the finger operated lever *p* fixed on a spindle 36 extending through the vertical plate *o* and connected at the back of this plate to a coiled spring 37, the lever being adapted to be held in its operative or inoperative position at will.

38 is a sheet metal stripper between which and the jockey pulley *n*, the perforated tape passes and in which are slots through which the peckers *c* and *d* work.

What I claim is:—

1. In an automatic telegraphic transmitter of the kind comprising a vertical support, two bell crank levers pivoted to the front side thereof and each having a horizontal arm and a depending arm, the two horizontal arms extending towards each other, a rotary tape feed wheel mounted at the front of said support, two upwardly extending peckers connected respectively to the inner ends of the two horizontal arms of said levers and adapted to co-operate with perforated tape, means for depressing the horizontal arms of said levers alternately and spring means tending to raise the horizontal arms of said levers and to move the depending arms of said levers towards each other, the combination with the two depending arms of the levers of two movable electric contacts carried thereby, two stationary contacts arranged between the movable contacts and carried by said support but insulated therefrom and two insulated contact

pins connected to said stationary contacts, extending through said support and adapted to make electrical connection with other insulated contacts, when the transmitter is mounted in position for use.

2. In an automatic telegraphic transmitter of the kind comprising a vertical support, two bell crank levers pivoted to the front side thereof and each having a horizontal arm and a depending arm, the two horizontal arms extending towards each other, a rotary tape feed wheel mounted at the front of said support, two upwardly extending peckers connected respectively to the inner ends of the two horizontal arms of said levers and adapted to co-operate with perforated tape, means for depressing the horizontal arms of said levers alternately and spring means tending to raise the horizontal arms of said levers and to move the depending arms of said levers towards each other the combination with the depending arms of said levers of movable electric contacts carried thereby, a block of insulating material fixed to said support, two stationary contacts carried by said block and arranged between and opposite the movable contacts and two pins connected to the respective stationary contacts, carried by said block, extending through said support and adapted to make electrical connection with other insulated contacts when the transmitter is mounted in position for use.

3. An automatic telegraphic transmitter of the type herein referred to, comprising a vertical support, a pair of spring controlled bell-crank levers pivoted thereto and arranged to move in the same vertical plane, a rocker beam for depressing said levers in alternate order against the action of their spring controlling means, said beam being pivoted to said support and having a slot therein, a rotary driving spindle carried by said support, an eccentrically arranged pin carried by one end of said spindle and a slide block connected to said pin and arranged to work in the slot in said beam, for the purpose set forth.

4. An automatic telegraph transmitter comprising a vertical plate having a horizontal peripheral rim, a tape feed wheel, a rotary spindle for said feed wheel, a pair of spring controlled bell crank levers pivoted to said plate and having depending arms, tape peckers carried by said levers and adapted to cooperate with perforated tape, means for actuating said levers in alternate order against the action of their spring controlling means, a driving shaft for actuating said lever actuating means, gearing between said driving shaft and spindle, movable contacts carried by the depending arms of said levers, stationary insulated contacts arranged between the movable contacts and carried by said plate, contact pins connected

to the stationary pins, extending through said plate and insulated from each other, a standard having an opening therein wherein said plate with associated parts is mounted and from which it can be readily withdrawn by lateral movement and a pair of insulated contacts carried by said standard and with which the pair of insulated pins will automatically make electrical connection when the plate is inserted laterally into such standard.

5. Automatic telegraph transmitting apparatus consisting of a unit comprising a vertical support, a tape feed wheel, a rotary spindle carried by said support and connected to said feed wheel, a pair of spring controlled bell crank levers, pivoted to said support, tape peckers carried by said levers, movable contacts carried by said levers, stationary contacts carried by but insulated from said support and arranged between the movable contacts, means for actuating said

bell crank levers in alternate order against the action of their spring controlling means, a rotary driving shaft for operating the lever actuating means, and gearing between said shaft and the tape wheel spindle, a standard having an aperture in which said unit is located and in which said unit can be placed by endways movement thereof, a second driving shaft held against endways movement, a stationary support for such shaft, a motor and variable speed mechanism between such driving shaft and motor, the last mentioned driving shaft and the driving shaft of said unit being coaxial and having their adjacent ends adapted to come automatically into driving connection with one another when said unit is inserted sideways in said standard.

Signed at New York, county and State of New York, U. S. A., this twenty-sixth day of June, 1922.

FREDERICK GEORGE CREED.