

June 16, 1925.

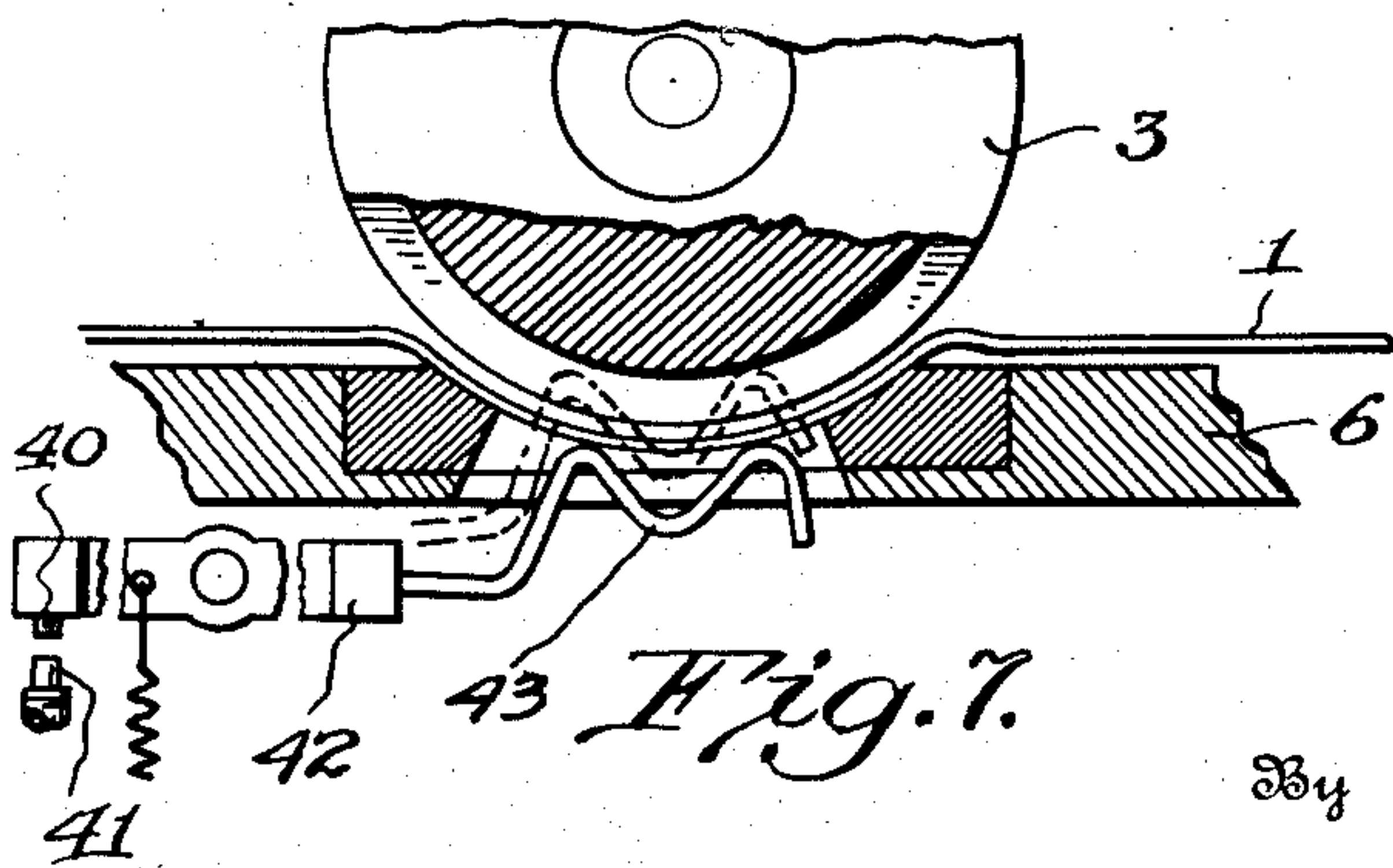
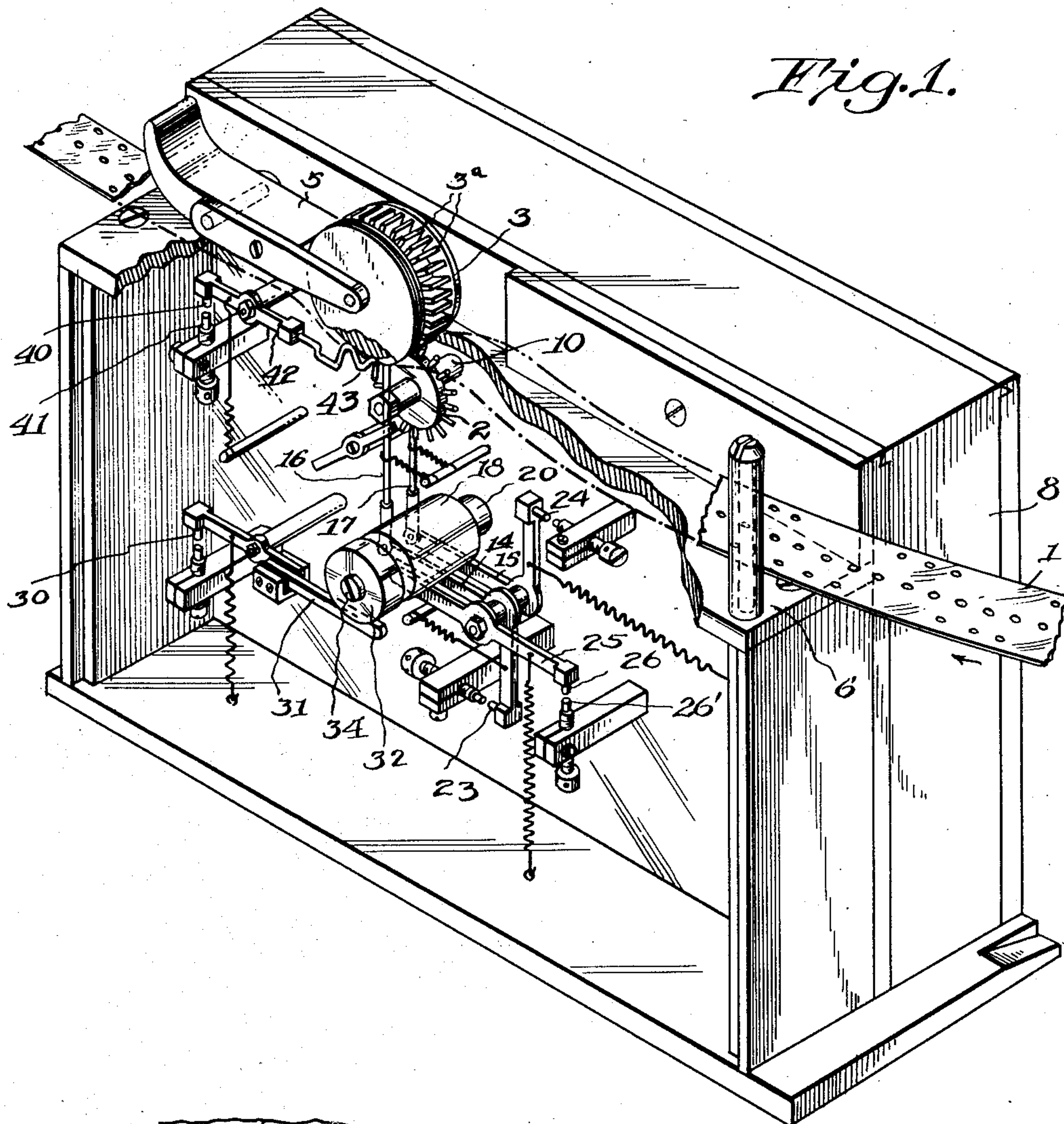
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W. C. PETERMAN

TAPE TRANSMITTER

Filed May 28, 1923

3 Sheets-Sheet 1



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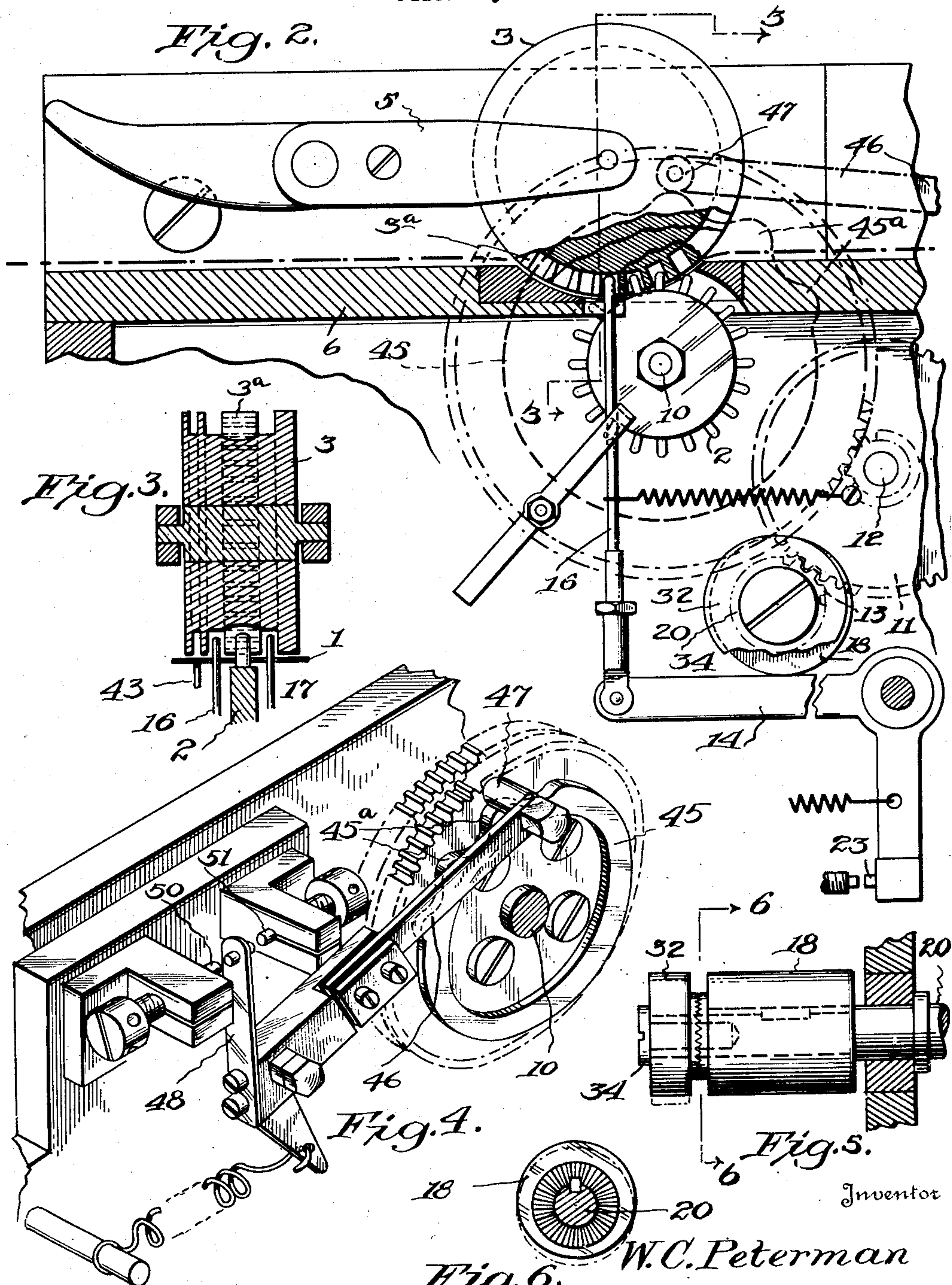
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3 Sheets-Sheet 2



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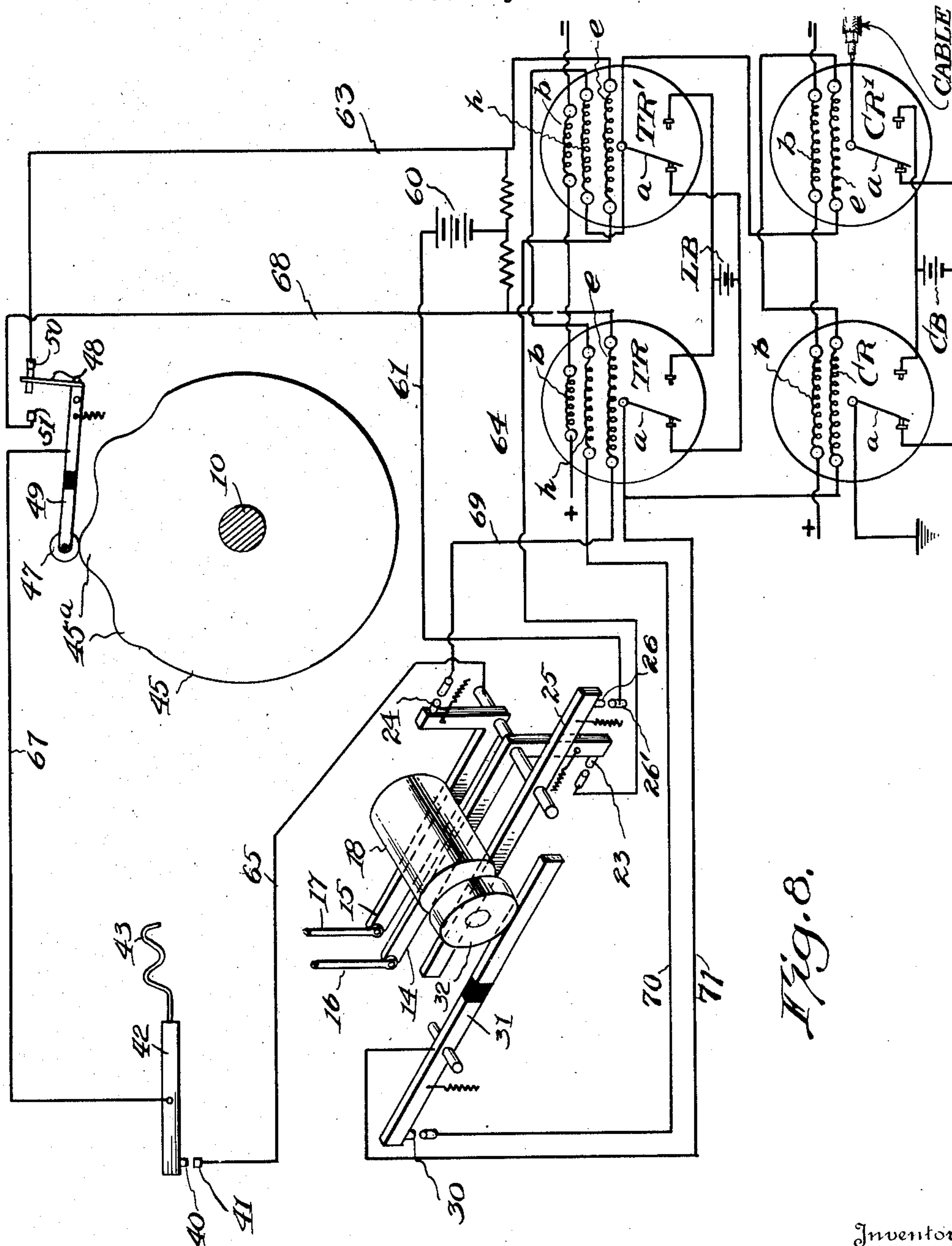


Fig. 8.

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UNITED STATES PATENT OFFICE.

WILLIAM C. PETERMAN, OF RUTHERFORD, NEW JERSEY, ASSIGNOR TO THE WESTERN UNION TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TAPE TRANSMITTER.

Application filed May 28, 1923. Serial No. 642,081.

To all whom it may concern:

Be it known that I, WILLIAM C. PETERMAN, a citizen of the United States, residing at Rutherford, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Tape Transmitters, of which the following is a specification.

This invention relates to transmitters for automatic telegraph systems, wherein a previously-perforated tape passes over the transmitting pins which control the electrical contacts and determine the impulses sent to the line or cable.

It is desirable that the length or period of the impulses should be accurately determined and also that this period should be varied to suit different conditions. One of the objects of my invention is to provide means for accurately timing both the make and the break of the transmitted impulses and for varying the period as desired.

In automatic telegraph systems it is desirable to maintain the instruments at the several stations in synchronism at all times. One of the purposes of my invention is to provide means for automatically sending a synchronizing signal over the line at recurring intervals whenever the transmitting tape becomes exhausted for the purpose of maintaining the instruments in synchronism.

In the accompanying drawings, Figure 1 is a perspective view of a transmitting instrument embodying my invention, parts of the casing being broken away to expose the working mechanism; Fig. 2 is an enlarged detail view of the tape moving star-wheel, the pecker pins and associated parts; Fig. 3 is a vertical section of the tape wheel on the line 3—3 of Fig. 2; Fig. 4 is a fragmentary perspective view of the cam and contacts which control the synchronizing signal sent to line when the no tape is in the transmitter; Fig. 5 is a detail view of the cam which controls the pecker pins; Fig. 6 is a sectional view on the line 6—6 of Fig. 5; Fig. 7 is an enlarged fragmentary detail view of the synchronizing lever and associated parts; and Fig. 8 is an illustrative diagram of the electrical circuits connected to the transmitter.

The tape 1 which has been previously perforated in a manner to indicate the code characters by the tape punching machine, is fed through the transmitter as usual by a

star wheel 2, operating upon a central row of feed holes, the pins of the wheel passing between the ribs or vanes 3^a of the tape wheel 3, which is carried in the fork of a pivoted lever 5 and serves to hold the paper down as it is moved over the shelf or ledge 6 of the transmitter box or casing 8.

The shaft or arbor 10 which carries the star-wheel 3, is driven through intermediate gearing from the drive shaft 12 which is connected to a constant speed motor preferably a phonic wheel of the well-known La Cour type.

The pecker-pins 16, 17, which enter the successive perforations of the tape, are pivoted to bell crank levers 14, 15, which are reciprocated by a cam 18, carried by the shaft 20, driven from the power shaft 12 through gear 11 and pinion 13. The eccentric or cam 18 is formed with a very gradual curve so that the pins 16 and 17 will be reciprocated with a smooth even motion and without chattering. The bell-crank lever 14 which carries the pecker-pin 16 on one arm, has the "dash" contact 23 secured to its other arm; and likewise the "dot" contact 24, is secured to the bell-crank lever 15, to which the pecker pin 17 is pivoted.

To ensure the closing of the circuit at the same instant of any signal period, the instrument is provided with a lever 25 which is also actuated by the cam 18 and carries the "curbing" contact 26. The curbing contacts 26, 26' are included in both the dot and the dash circuits so that neither circuit can be closed until the curbing contacts are closed. The fixed contact 26' is so adjusted that it will not be engaged by contact 26 until after the contacts 23 and 24 engage their fixed contacts, and the instant of contact may be determined accurately. In this manner the particular point in the signal period at which the current impulse to line shall begin, is accurately determined.

Likewise it is desirable to determine with accuracy the opening of the circuit and cutting off of the signal impulse and to be able to vary this ad libitum. Moreover it is desirable to continue the marking impulse after the time when the cam 18 has begun to lower the pins 16, 17 and has opened the contacts 26 and one or the other of contacts 23, 24. I accomplish these objects by providing a locking circuit through the transmitting relays which includes a locking contact 30

carried by pivoted lever 31, and a separate eccentric or cam 32 on the shaft 20 angularly adjustable with respect to the cam 18. By loosening the screw 34 the cam 32 can be shifted to any desired position and then locked by tightening the screw. This cam can be adjusted so that the locking contact 30 closes a holding circuit through the transmitting relays after the circuit has been closed by the curbing contact 25 through either the dot or the dash circuit and maintains said holding circuit closed through any desired portion of the signal period. It will be evident that the signal impulse may be maintained until just prior to the closing of the dot or dash contact for the succeeding signal. The duration of the signal impulses is thus independent of the movement of the pecker pins and can be varied at will.

During the transmission of messages the transmitting and receiving instruments are maintained through the operation of the current impulses of the code characters in the manner well understood but this can only occur while the tape is passing through the transmitter. One purpose of my invention is to provide means for automatically sending a series of impulses over the line at regular intervals to maintain the synchronous operation of the instrument when the tape runs out and until another perforated tape is inserted.

For this purpose a synchronizing control contact 40 carried by a lever 42, having a presser finger 43 which bears against the lower side of the tape and holds the contact 40 away from contact 41. A disk 45 carried by the star-wheel shaft 10, is provided with a plurality of undulations or cam portions 45^a at one part of its periphery, which produce a rocking movement of the lever 46 as the roller 47 rides over said undulations. The opposite end of the lever carries a contact arm 48 which is brought alternately into engagement with the contacts 50 and 51 as the lever is rocked by said cam projections 45^a. The contacts 50 and 51 are connected with the same pole of battery 60 and respectively with one terminal of the energizing coils *e* of the transmitting relays TR and TR'.

Normally the contacts 40, 41 are held open by the lever 42, but when the tape runs out these contacts are closed. As the transmitter is continuously actuated by its motor, the dot 24 and the dash contacts 23 will be closed simultaneously by the reciprocating pecker pins and each time the curbing contact 26 is closed, circuits are closed from battery 60 through conductor 61, contacts 23 and 24 and the energizing coils *e* of the transmitting relays TR and TR'. At the same instant the lever 49 is rocked back and forth as the roller 47 engages the cam pro-

jections 45^a. When the contact arm 48 engages the contact 50, the coil *e* of the relay TR' is short-circuited through conductor 63, 64, transmitter contact 23, conductors 65 and 67. Consequently only relay TR will be energized. Likewise when the arm 48 swings over against contact 57 energizing coil *e* of relay TR is short-circuited through conductors 68, 69 transmitter contact 24 and conductors 65 and 67, so that only relay TR' will be energized. In this manner dot and dash signals will be sent to line alternately at each revolution of the disk 45 as the reversing cam projections 45^a rock the lever 49 and these signal impulses will serve to maintain the apparatus at the several stations in synchronism.

The armature *a* of the transmitting relays TR, TR' and of the cable relays CR, CR' are normally held against their left hand contacts by biasing coils *b*. The actuating coils *e* of the cable relays are energized from the local battery LB in accordance with the movements of the armatures of the transmitting relays to thereby connect the cable with the positive or negative pole of the cable battery CB or to ground, as is well understood by telegraph engineers.

The locking circuit through the conductors 70, 71 and the holding coils *h* of the transmitting relays, under the control of the contact 30 on the locking lever 31, is energized from the battery LB as a shunt to the circuit which actuates the coils *e* of the cable relays CR.

I claim:—

1. An automatic telegraph transmitter, comprising mechanism adapted to feed a perforated message strip or tape through the instrument, selecting contact devices controlled by said tape for transmitting current impulses over telegraph circuits, adjustable means for initiating each impulse, locking means for maintaining the circuit closed for any predetermined period after the initiation of each impulse.

2. An automatic telegraph transmitter, comprising mechanism adapted to feed a perforated message strip or tape through the instrument, selecting contact devices controlled by said tape for transmitting current impulses, means independent of the tape for periodically transmitting current impulses and means controlled by the tape for preventing the operation of said last named means.

3. An automatic telegraph transmitter, comprising mechanism adapted to feed a perforated message strip or tape through the instrument, selecting contact devices controlled by said tape for transmitting current impulses over a telegraph line, transmitting relays having their energizing coils controlled by said selecting devices, and cam-controlled means for prolonging

the length of impulses over said line for a predetermined period after said selective devices relinquish their control.

4. An automatic telegraph transmitter, 5 comprising mechanism adapted to feed a perforated message strip or tape through the instrument, selecting contact devices controlled by said tape for transmitting current impulses, transmitting relays having 10 their energizing coils controlled by said selecting devices, contact devices operating to periodically short-circuit said coils in alternation, and a circuit closing switch in circuit with said contact devices having tape 15 engaging means to maintain the switch in open ineffective position while a tape is being fed through the instrument.

5. In an automatic telegraph transmitter as set forth in claim 3, means for alternately 20 short-circuiting said energizing coils periodically during the interval the selecting

contact devices are in closed position, and tape controlled means for rendering said short-circuiting device ineffectual as long as 25 a tape is being fed through the instrument.

6. An automatic telegraph transmitter, comprising automatic contact making mechanism having selecting means cooperating with a perforated message strip for determining the character of a transmitted current impulse, transmitting relays having 30 their energizing coils controlled by said selecting means, said relays having holding coils, and cam-actuated contact devices operating automatically to close a circuit 35 through said holding coils to maintain said relays in actuated condition for a predetermined period after the circuit has been opened through said energizing coils.

In testimony whereof I affix my signature.

WILLIAM C. PETERMAN.