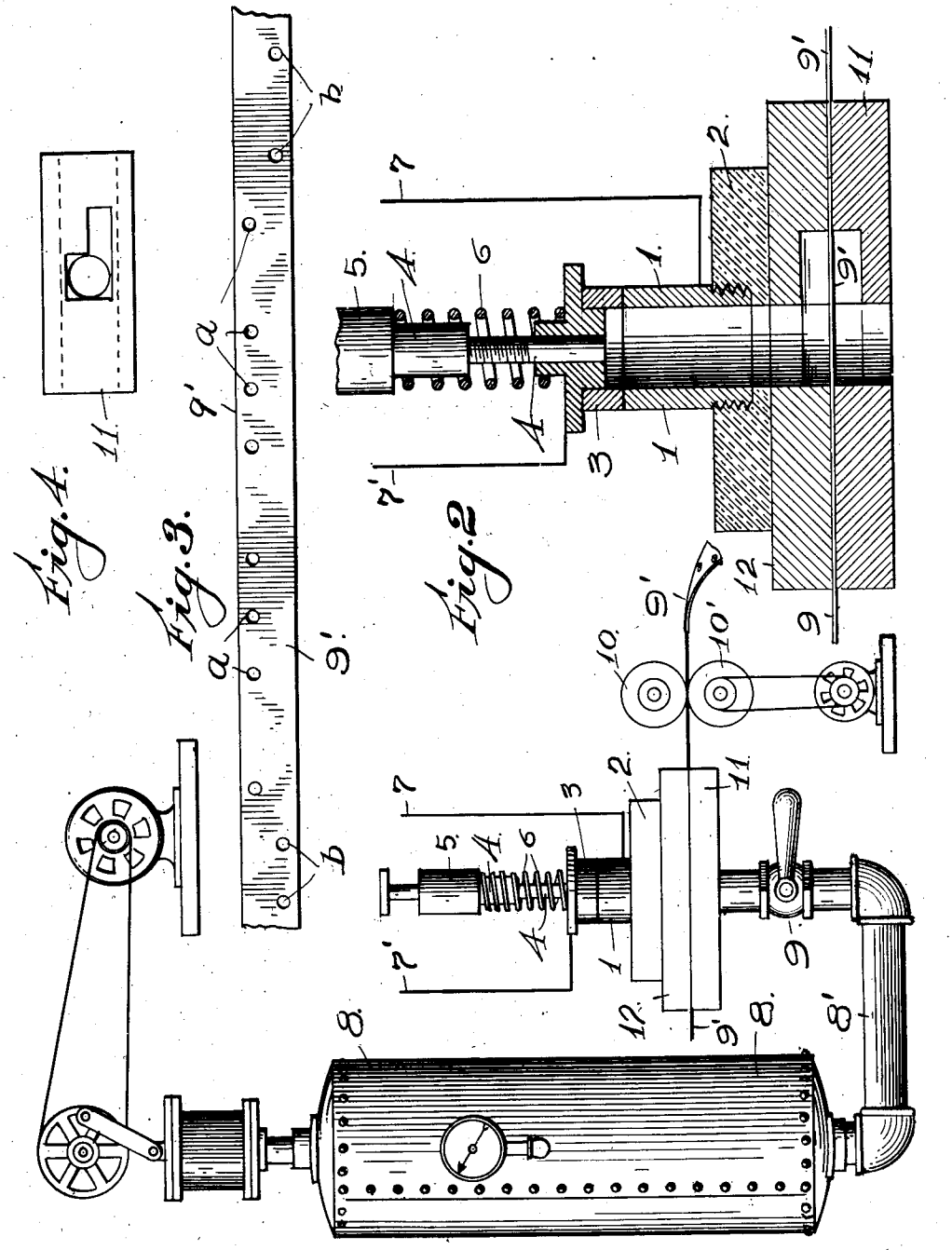
F. RIEBER.

APPARATUS FOR PRODUCING ELECTRIC SIGNALS.

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APPARATUS FOR PRODUCING ELECTRIC SIGNALS.

1,093,292. Specification of Letters Patent. Patented Apr. 14, 1914.

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To all whom it may concern:

Be it known that I, FRANK RIEBER, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Apparatus for Producing Electric Signals, of which the following is a specification.

The present invention relates to a method of rapidly opening an electric circuit for the forming of telegraphic signals, for use more particularly in causing the interruption of a circuit through a portion of the inductance in the oscillating circuit used in the "arc" system of space telegraphy.

The method consists in the application of air under pressure to the movable contact for forcing the same from the fixed contact with which it is normally in contact, the duration of the separation of the contact or the opening of the electric circuit depending on the signal to be projected.

Ordinarily, the interruption of the circuit in connection with space or wireless telegraphy is accomplished by the use of a complex apparatus comprising a system of disks, rotating on a common axis. Two of these disks carry on their peripheries a number of pins, while the other disks carry commutator segments. On a properly punched tape being fed through the machine, the pins are caused to project, corresponding to the dots and dashes in the message, which pins close the circuit to produce the proper signals. To avoid injury to the pins through arcing of the comparatively large current employed, the circuit is broken by the commutators before being broken by the pins. The whole constitutes a delicate and complicated piece of mechanism of limited speed of operation, provided with a large number of easily injured moving parts. Such an apparatus, besides being somewhat costly, is extremely difficult to repair.

By the employment of pneumatic pressure for actuating the contacts to open the circuit, for the forming of telegraphic signals, an apparatus may be employed comprising a simple and easily replaced moving part, which is capable of much greater speed of operation than the device at present in use.

To comprehend the invention reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a diagrammatic view of an apparatus for carrying out the improved method. Fig. 2 is an enlarged detail sectional view of the fixed and movable contacts for controlling the opening and closing of the circuit. Fig. 3 is a plan view of a perforated tape containing a printed message to be forwarded. Fig. 4 is a plan view of one of the plates between which the perforated tape passes.

In the drawings, the numeral 1 is used to indicate a suitable tubular contact secured within a fixed base 2 of any suitable material, and 3 a movable contact for normally closing the tubular contact, the said movable contact being provided with a stem 4 which works within a fixed tubular guide 5, and the movable contact is held down by the pressure of the spring 6 which surrounds the stem thereof and bears against the end of the guide 5 and the upper face of the contact 3. With the contacts 1 and 3 connect respectively the current wires 7 and 7′, leading from a suitable source of supply.

At any convenient point is located a reservoir 8, containing air under pressure, which pressure reservoir is connected to the tubular fixed contact 1 by means of a pipe or tube connection 8′. Within the said connection, adjacent the operator of the apparatus, is located a hand actuated cock 9, for controlling the flow of air under pressure through the connection 8′ to the fixed tubular contact 1.

The signals to be sent are preferably punched in a paper tape 9′, which is passed between the plates 11 and 12, being drawn therethrough by the rolls 10 and 10′. The signals are punched in the paper tape in the usual manner, as in the Wheatstone transmitter. The punched perforations *a* on one side of the center of the tape represent dots, while the perforations *b* on the opposite side of the center of the tape designate dashes.

The punched tape is employed where automatic interruption of the circuit is desired. This tape is passed between two suitable plates 11 and 12, provided with opposed apertures with which the apertures of the punched tape come into registry as passed between the said plates. The passage of air from one aperture to the other is normally prevented by the intervening web of the tape. As the tape is passed between the plates, the cock 9 being turned to open the connection 8′ for the flow of air under pressure from the reservoir 8, the punched perforations therein move over the aperture in

the lower plate 11, which uncovering an aperture in the said lower plate permits a current of air under pressure to flow through the plates 11 and 12 and the tubular contact 1, the pressure of which raises the contact 3 to break the circuit through the said contacts, the contact 3 being held separated from the fixed contact 1 until the perforation in the traveling tape is carried beyond the aperture of the plate 11, when the said aperture is closed by the intervening solid portion of the tape to cut off the flow of air through the plate 11. The moment the flow of air is cut off, the pressure of the spring 6 exerts itself to force downwardly the movable contact 3 to close the circuit. It will thus be observed that the electrical circuit is broken for a period of time equal to the length of the aperture in plate 11 over which the punched hole in the tape passes between the plates 11 and 12. For instance, if a punched hole in the tape corresponding to a dot is moved to uncover the shorter aperture of the plate 11, the air current passing therethrough will raise the movable contact for the breaking of the electrical circuit for a short period of duration, while on the longer aperture of the said plate 11 being uncovered by one of the punched holes *b* in the traveling tape indicative of a dash, the air current passing therethrough will be maintained for a longer period and the movable contact held raised correspondingly, so that an interruption of longer duration will result. The pressure of air raising the movable contact breaks the circuit and blows out the ensuing arc.

While the opening of the aperture for the admission of air under pressure to actuate the opening movement of the movable contact, has been described as being accomplished through the medium of a traveling perforated tape, it is obvious that any means may be employed for this purpose.

The transmitting capacity of an apparatus as described for carrying out the herein method is many times greater than the machines at present employed, inasmuch as the complex working instrumentalities of such machines are dispensed with.

Having thus described the invention what is claimed as new and desired to be protected by Letters Patent is—

1. In an apparatus for breaking an electric circuit for producing electric signals in spaced telegraphy and wiping out the ensuing arc, the combination with a fixed tubular contact, a movable contact associated therewith, electrical connections between each of said contacts and a source of electric energy, a connection between said fixed contact and a supply of air under pressure, and means for admitting air under pressure to the movable contact for separating the same from the fixed contact for a period corresponding to either a dash or a dot in spaced telegraphy, the air passing between the contacts when separated to extinguish the arc formed therebetween.

2. In an apparatus for breaking an electric circuit for producing electric signals in spaced telegraphy and wiping out the ensuing arc, the combination with a fixed tubular contact, a movable contact associated therewith, a connection between each of said contacts and a source of electric energy, a connection between said fixed contact and a supply of air under pressure, means for admitting air under pressure to the movable contact for separating the same from the fixed contact for a period corresponding to a dot or dash in spaced telegraphy, the air passing between the contacts when separated to extinguish the arc formed therebetween, and means for restoring the movable contact to normal position on the interruption of the air pressure applied thereto.

3. In an apparatus for breaking an electric circuit for producing electric signals in spaced telegraphy and wiping out the ensuing arc, the combination with two normally engaged contacts, a connection between each of said contacts and a source of electric energy, a connection between one of said contacts and a source of air under pressure, and means for permitting air under pressure from said connection to separate said contacts for a period corresponding to a dot or a dash in spaced telegraphy, the air passing between the contacts when separated to extinguish the arc formed therebetween.

4. In an apparatus for breaking an electric circuit for producing electric signals in spaced telegraphy and wiping out the ensuing arc, the combination with two normally engaged contacts, a connection between each of said contacts and a source of electric energy, a connection between one of said contacts and a source of air under pressure, means for permitting air under pressure from said connection to separate said contacts for a period corresponding to a dot or a dash in spaced telegraphy, the air passing between the contacts when separated to extinguish the arc formed therebetween, and means for restoring the contacts to normal position on the interruption of the air pressure applied thereto.

5. In an apparatus for breaking an electric circuit for producing an electric signal in spaced telegraphy and wiping out the ensuing arc, the combination with a fixed tubular contact, a spring held movable contact normally in engaged relation with said fixed contact, a connection between each of said contacts and a source of electric energy, an air pressure reservoir, a connection between the fixed tubular contact and the air reservoir, and means for intermittently

admitting air under pressure to flow through said connection and said fixed tubular contact for separating the movable contact from the fixed contact for periods corresponding to dots or dashes in spaced telegraphy, the air passing between the contacts when separated to extinguish the arc formed therebetween.

6. In an apparatus for breaking an electric circuit for producing electric signals in spaced telegraphy and wiping out the ensuing arc, the combination with a fixed tubular contact, a movable contact normally in engaged relation with said fixed contact, a connection between each of said contacts and a source of electric energy, and mechanism for intermittently causing air under pressure to flow through said fixed tubular contact and act against the said movable contact for separating the same from the fixed tubular contact for a period corresponding to a dot or a dash in spaced telegraphy.

7. In an apparatus for breaking an electric circuit for producing electric signals in spaced telegraphy and wiping out the ensuing arc, the combination with a fixed tubular contact, a movable contact normally in engaged relation with said fixed contact, a connection between each of said contacts and a source of electric energy, mechanism for intermittently causing air under pressure to pass through said fixed contact and act against said movable contact for separating the same from the fixed contact for a period corresponding to a dot or dash in spaced telegraphy, the air adapted to pass between the contacts when separated, thereby extinguishing the ensuing arc, and means for restoring the movable contact to normal position on an interruption of the air pressure applied thereto.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK RIEBER.

Witnesses:
N. A. ACKER,
D. B. RICHARDS.