

No. 817,390.

E. A. REYNOLDS.

PATENTED APR. 10, 1906.

PRIVACY DEVICE AND BUSY SIGNAL FOR TELEPHONE APPARATUS
AND SYSTEMS.

APPLICATION FILED AUG. 19, 1904.

2 SHEETS—SHEET 1.

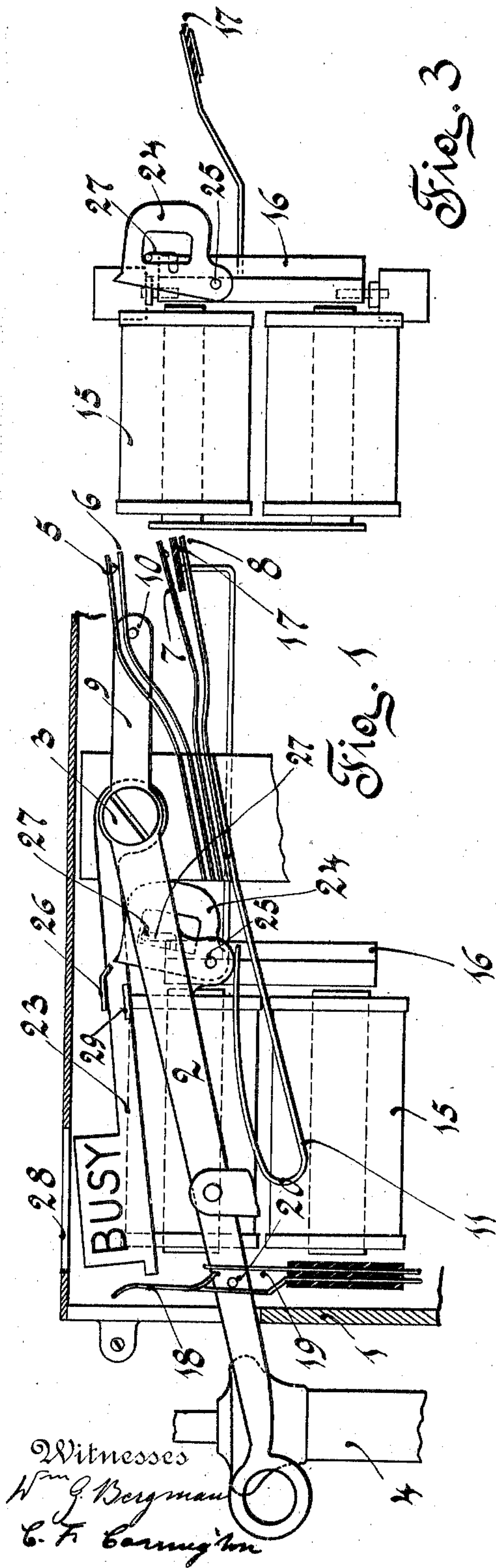


Fig. 3

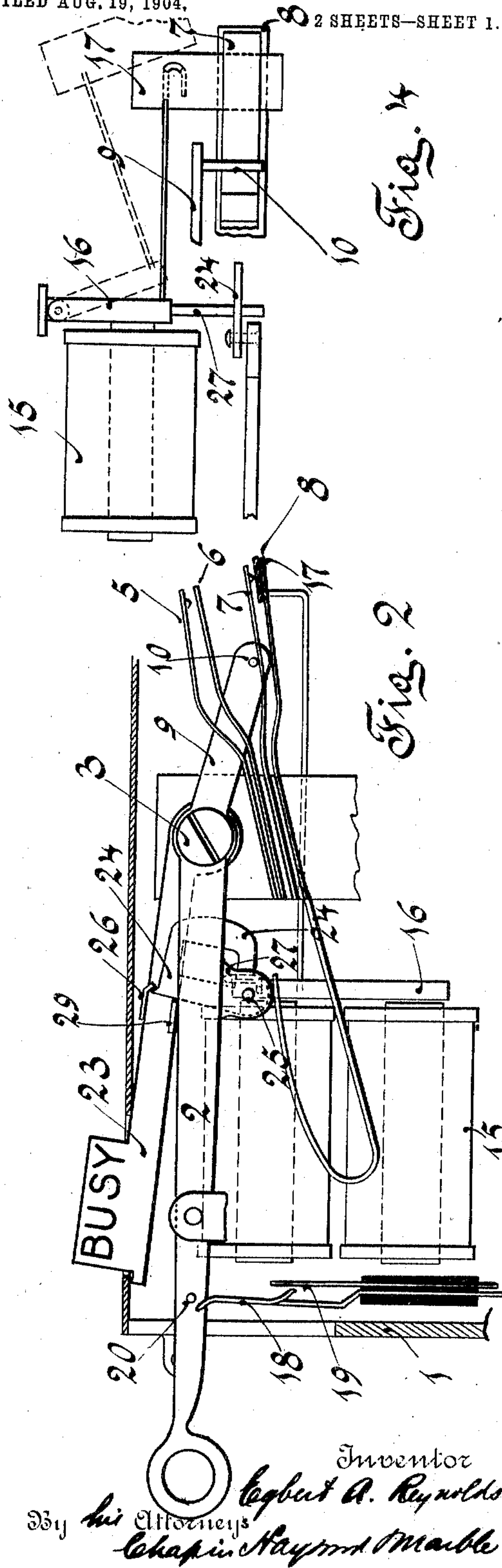


Fig. 4

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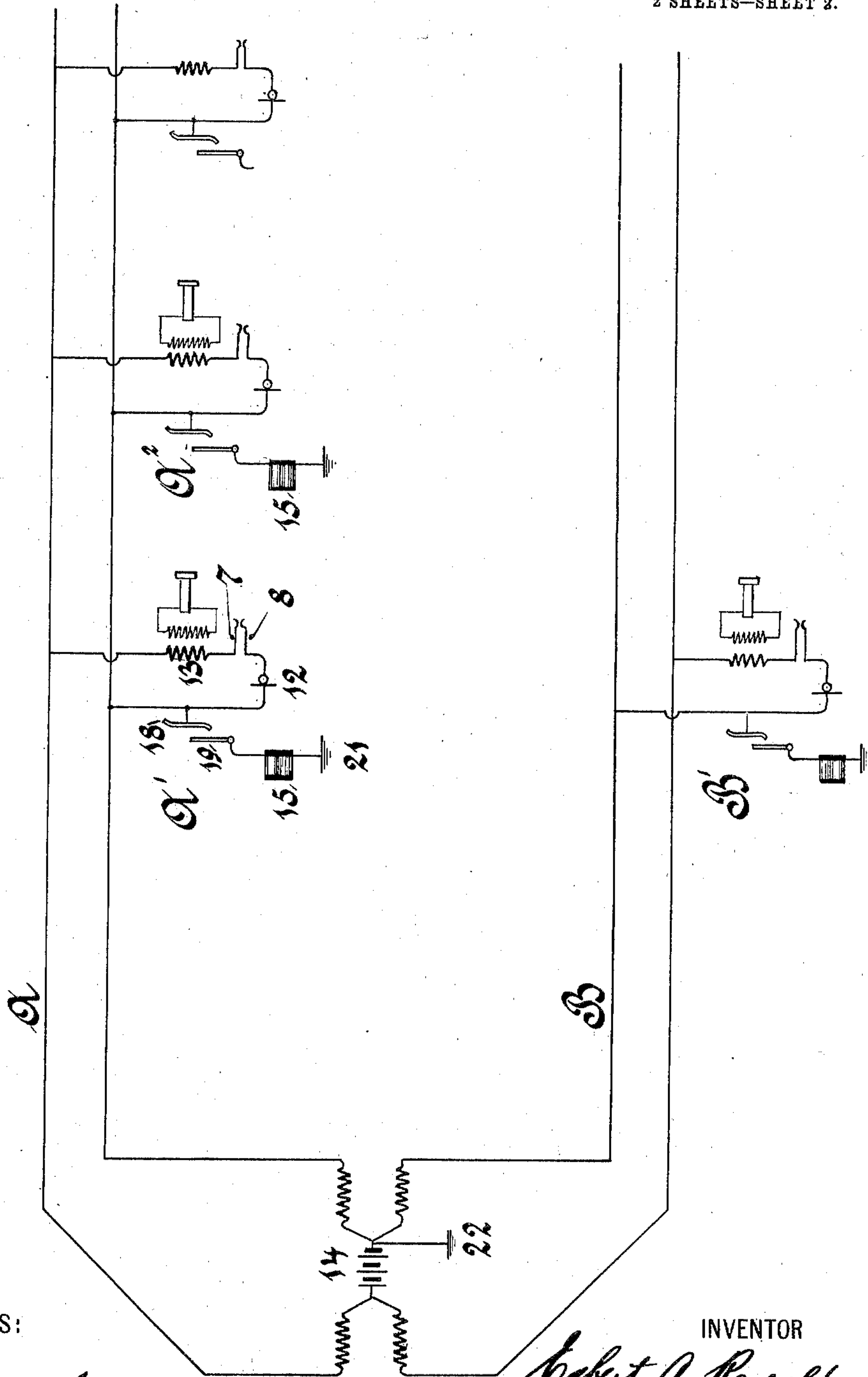
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2 SHEETS—SHEET 2.

Fig. 5



WITNESSES:

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UNITED STATES PATENT OFFICE.

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PRIVACY DEVICE AND BUSY-SIGNAL FOR TELEPHONE APPARATUS AND SYSTEMS.

No. 817,390.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed August 19, 1904. Serial No. 221,363.

To all whom it may concern:

Be it known that I, EGBERT A. REYNOLDS, a citizen of the United States of America, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Privacy Devices and Busy-Signals for Telephone Apparatus and Systems, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in telephone instruments and systems, and particularly to improvements adapted for use in connection with party-line telephones.

My invention consists in certain improved means on party-lines for preventing interference between the different instruments on the same line, so that when one party is using the line another party on the same line cannot hear what is being said.

My invention also consists in means for displaying a signal indicating that the line is being used to a party attempting to use the instrument on a line already occupied.

My invention also consists in certain novel details of construction and combination of parts, as will hereinafter be fully set forth.

I will now proceed to describe an apparatus and system embodying my invention and will then point out the novel features in claims.

In the drawings, Figure 1 is a fragmentary view of a telephone set having a privacy device and busy-signal embodying my invention, the parts being shown in their normal rest positions. Fig. 2 is a similar view with the receiver off the hook, the busy-signal set, and the privacy device in operation. Fig. 3 is a face view of certain mechanism included in the privacy device, showing the parts in their out-of-operation position. Fig. 4 is a top view showing the parts in their in-operation position. Fig. 5 is a diagrammatic view showing the circuits employed.

In the illustration I have only shown such parts of a telephone set as are necessary for the full understanding of my invention, and it will be understood that the invention is in no wise limited to the particular class of instruments shown, as obviously it has a wide range of adaptability.

In the present form I have shown a casing 1, supporting a telephone-hook 2, pivoted at

3. said telephone-hook arranged to receive and support a receiver 4 in a manner well known. I have shown the casing as supporting two sets of contact-springs 5, 6, 7, and 8. The contact-springs 5 and 6 are intended to be included in the ringing-circuit, and hence are normally closed. They form no part of the present invention, and hence they and the circuits therefor need not be referred to in detail. The contact-springs 7 and 8 are intended to be located in the talking-circuit and are broken as to electric contact in the normal position of the instrument. The telephone-hook 2 has an arm 9, carrying a laterally-projecting stud 10, located between the lower ringing-circuit contact-spring 6 and the upper talking-circuit contact-spring 7. When the instrument is not in use and the receiver 4 is on the hook, the stud 10 presses the contact-spring 6 in engagement with the contact-spring 5, closing the ringing-circuit, but, being out of engagement with the contact-spring 7, allows the same to free itself from engagement with the contact-spring 8 by its own resilience. When the receiver 4 is lifted from off the hook and the hook is moved upwardly under tension of the usual spring 11, the stud 10 will move down to force the contact-spring 7 in engagement with the contact-spring 8, so as to close the talking-circuit and release the contact-spring 6 from engagement with the contact-spring 5, so as to open the ringing-circuit. It will be observed, however, that the relationship of the parts is such that the closing of the contact-points 7 and 8 is not effected until approximately the completion of the movement of the telephone-hook. The closing of the contact-springs 7 and 8 will connect the instrument with the line in any ordinary manner, one way being as shown in the diagrammatic view, Fig. 5, in which the contact-springs 7 and 8 are shown in series with the transmitter 12 and with the primary of the induction-coil 13 bridged across the main line. I have shown two main lines A and B, and I have shown them directly connected with the central-energy generator 14, omitting the jacks, plugs, drops switches, keys, and like devices for the sake of clearness, the two lines being thus connected with each other, so that a subscriber on line B is in a position to talk with a subscriber on line A. I have shown two instru-

ments in the diagrammatic view on line A, designating them A' and A².

The privacy device comprises electromagnetic coils 15, an armature 16, and an insulating-finger 17, carried thereby. The coils 15 are preferably of low resistance and are interposed in a branch between the return-leg of the line and the ground. In the circuit of the said coils are two contact-springs 18 and 19, said contact-springs being normally out of electric connection with each other, so that circuit through the said coils is normally broken. The telephone-hook 2 has a pin or cam 20, which engages the contact-spring 18 upon the initial upward movement of the hook 2, pressing the said spring against the contact-spring 19 to close electrical communication therethrough, and then passes on, freeing the said spring, which moves out of electrical contact again by its own resilience. Thus the telephone-hook in its initial upward movement momentarily closes the contacts in the branch, including the electromagnet 15, and then opens them again prior to the closing of the talking-circuit contacts 7 and 8. On the return movement the pin or cam 20 is arranged to pass along the inside of the contact-spring 18, so that contact is only made upon the upward movement of the telephone-hook and not upon the downward movement thereof. Closing of circuit through the coils 15 energizes same and attracts the armature 16 thereto, swinging the insulating-finger 17 horizontally in between the talking-circuit contact-springs 7 and 8, above referred to. The insulating-finger when between the contact-springs 7 and 8 will prevent electrical contact thereof upon the completion of the movement of the telephone-hook, so that the talking-circuit will not be completed. When the insulating-piece is thus thrust between the contact-springs, the pressure on the said springs exerted by the hook in its upward movement will hold the insulating-piece by frictional engagement after the circuit of the coils 15 has been broken at the points 18 and 19. The said insulating-piece will therefore be so held and not released until the telephone-hook is again lowered. In this connection it will be observed that the operation of the parts should be so timed that the hook will actually commence to press the contact-spring 7 toward the contact-spring 8 before the circuit is broken at 18 and 19, such movement being sufficient to nip the insulating-strip 17 between the contacts 7 and 8, but not sufficient to close circuit between the contacts 7 and 8 before the circuit of the coils 15 has been opened at 18 19. Referring again to the diagrammatic view, it will be seen, however, that the closing of contact through the contact-springs 18 19 will not energize the coils 15 unless the line is "alive" at the time, and the line will only be alive at this time should some other instrument on the same line be at

that time in use. If another instrument is in use and the line is alive, a small quantity of current will be deflected from the return-leg of the circuit down through the contact-springs 19 18, through the coils 15 to ground 21, and up through ground 22 at the central station back to the central-energy generator 14.

From the foregoing it will be seen that if the line is not busy the privacy device will not operate when the telephone-receiver is removed from the hook; but when the line is busy the privacy device will prevent talking-circuit being closed through any other instrument on the same line.

In order to warn the subscriber that the line is busy, I have provided a busy-signal comprising an arm 23, loosely pivoted upon the telephone-hook support 3 and its end arranged to protrude through the casing to display the word "Busy" written thereon. In order to operate the arm, I have provided the telephone-hook with a detent 24, loosely pivoted thereon at 25, such detent being permitted to move out of and into the path of a projection 26, carried by the arm 23. The armature 16 is provided with a finger 27, adapted to engage the detent 24 and to throw same into the path of the projection 26 when the coils 15 are energized. The detent will be so moved at the first upward movement of the telephone-hook 2 that during its latter movement the detent 24, engaging the projection 26, will carry the busy-signal arm up with it to display the busy-sign through the opening 28 in the casing 1. An abutment 29 upon the signal-arm 23 forms a limiting-stop for the detent to limit its forward movement, and the said detent is arranged to drop back to its normal position by gravity, such movement being limited by the finger 27. The detent, however, will not return by gravity even after the coils 15 are deenergized until the hook is again lowered to its normal position, its engagement with the projection 26 being sufficient to prevent such movement. Thus a subscriber attempting to use a telephone on a busy line will immediately be appraised of the fact by a busy-signal displayed through the casing. Normal movement of the telephone-hook up and down will not affect the busy-signal arm the detent passing freely to the rear of the projection 26 out of the path thereof and the said arm 23 remaining at rest within the casing.

What I claim is—

1. In a telephone system, the combination with a generator and a conductor arranged to connect therewith, of a plurality of telephone instruments, each provided with a switch for connecting same in talking-circuit with the conductor and having a common return to said generator, of a privacy device for each instrument including an electromagnet arranged in a normally open branch

in series with said talking-switch, said branch, when closed, also constituting a return-path from the said switch to the generator, and means for momentarily closing and then opening the branch of any one instrument prior to the closing of the talking-switch thereof, whereby circuit will only be completed through the privacy branch of one instrument and the talking-switch of another instrument.

2. In a telephone system, the combination with a central-energy generator, a line-circuit, and a plurality of telephone instruments arranged to be connected in said circuit, of a privacy device for each instrument, including an electromagnet, and means, operating when the line-circuit is connected to the generator, for energizing the privacy device of any one instrument only with the attempted operation of its own instrument concurrently with another said instrument.

3. In a telephone system, the combination with a generator and a conductor arranged to connect therewith, of a plurality of telephone instruments, each provided with a switch for connecting same in talking-circuit with the conductor and having a common return to said generator, of a privacy device for each instrument including an electromagnet arranged in a normally open branch in series with said talking-switch, and an insulator controlled by said electromagnet, adapted to be inserted between the contacts of said switch, said branch, when closed, also constituting a return-path from the said switch to the generator, and means for momentarily closing and then opening the branch of any one instrument prior to the closing of the talking-switch thereof, whereby circuit will only be completed through the privacy branch of one instrument and the talking-switch of another instrument.

4. In a telephone system, the combination with a central-energy generator, a line-circuit, and a plurality of telephone instruments arranged to be connected in said circuit, of a privacy device for each instrument, including an electromagnet, and an insulator controlled thereby adapted to be inserted between the contacts of said switch, and means, operating when the line-circuit is connected to the generator, for energizing the privacy device of any one instrument only with the attempted operation of its own instrument concurrently with another said instrument.

5. In a telephone system, the combination with a generator and a conductor arranged to connect therewith, of a plurality of telephone instruments, each provided with a switch for connecting same in talking-circuit with the conductor and having a common return to said generator, of a busy-signal device for each instrument including an electromagnet arranged in a normally open

branch in series with said talking-switch, said branch, when closed, also constituting a return-path from the said switch to the generator, and means for momentarily closing and then opening the branch of any one instrument prior to the closing of the talking-switch thereof, whereby circuit will only be completed through the busy-signal branch of one instrument and the talking-switch of another instrument.

6. In a telephone system, the combination with a central-energy generator, a line-circuit, and a plurality of telephone instruments arranged to be connected in said circuit, of a busy-signal device for each instrument, including an electromagnet, and means, operating when the line-circuit is connected to the generator, for energizing the busy-signal device of any one instrument only with the attempted operation of its own instrument concurrently with another said instrument.

7. In a telephone system, the combination with a generator and a conductor arranged to connect therewith, of a plurality of telephone instruments, each provided with a switch for connecting same in talking-circuit with the conductor and having a common return to said generator, of a busy-signal device for each instrument including an electromagnet arranged in a normally open branch in series with said talking-switch, and an insulator controlled by said electromagnet adapted to be inserted between the contacts of said switch, said branch, when closed, also constituting a return-path from the said switch to the generator, and means for momentarily closing and then opening the branch of any one instrument prior to the closing of the talking-switch thereof, whereby circuit will only be completed through the busy-signal branch of one instrument and the talking-switch of another instrument.

8. In a telephone system, the combination with a central-energy generator, a line-circuit, and a plurality of telephone instruments arranged to be connected in said circuit, of a busy-signal device for each instrument, including an electromagnet, and an insulator controlled thereby adapted to be inserted between the contacts of said switch, and means, operating when the line-circuit is connected to the generator, for energizing the busy-signal device of any one instrument only with the attempted operation of its own instrument concurrently with another said instrument.

9. In a telephone system, the combination with a generator and a conductor arranged to connect therewith, of a plurality of telephone instruments, each provided with a switch for connecting same in talking-circuit with the conductor and having a common return to said generator, of a busy-signal and privacy device for each instrument including an elec-

5 tromagnet arranged in a normally open branch in series with said talking-switch, said branch, when closed, also constituting a return-path from the said switch to the generator, and means for momentarily closing and then opening the branch of any one instrument prior to the closing of the talking-switch thereof, whereby said circuit will only be completed through the busy-signal and privacy branch of one instrument and the talking-switch of another instrument.

10 10. In a telephone system, the combination with a central-energy generator, a line-circuit, and a plurality of telephone instruments arranged to be connected in said circuit, of a busy-signal and privacy device for each instrument, including an electromagnet, and means, operating when the line-circuit is connected to the generator, for energizing the busy-signal and privacy device of any one instrument only with the attempted operation of its own instrument concurrently with another said instrument.

15 11. In a telephone system, the combination with a generator and a conductor arranged to connect therewith, of a plurality of telephone instruments, each provided with a switch for connecting same in talking-circuit with the conductor and having a common return to said generator, of a busy-signal and privacy device for each instrument including an electromagnet arranged in a normally open branch in series with said talking-switch, and an insulator controlled by said electromagnet, adapted to be inserted between the contacts of said switch, said branch, when closed, also constituting a return-path from the said switch to the generator, and means for momentarily closing and then opening the branch of any one instrument prior to the closing of the talking-switch thereof, whereby circuit will only be completed through the busy-signal and privacy branch of one instrument and the talking-switch of another instrument.

20 12. In a telephone system, the combination with a central-energy generator, a line-circuit, and a plurality of telephone instruments arranged to be connected in said circuit, of a busy-signal and privacy device for each instrument, including an electromagnet, and an insulator controlled thereby, adapted to be inserted between the contacts of said switch, and means, operating when the line-circuit is connected to the generator, for energizing the busy-signal and privacy device of any one instrument only with the attempted operation of its own instrument concurrently with another said instrument.

25 13. In a telephone system, the combination with a privacy device, a circuit-closer therefor, and a receiver-hook, of means operated by the receiver-hook during its upward movement, and upon upward movement only thereof, to momentarily operate the circuit-closer.

14. In a telephone system, the combination with a privacy device, a circuit-closer therefor, and a receiver-hook, of means connected with the receiver-hook for momentarily closing the said circuit-closer upon upward movement thereof, said means failing to operatively engage the circuit-closer upon return movement of the hook.

15. In a telephone system, the combination with a busy-signal, a circuit-closer therefor, and a receiver-hook, of means operated by the receiver-hook during its upward movement, and upon upward movement only thereof, to momentarily operate the circuit-closer.

16. In a telephone system, the combination with a busy-signal, a circuit-closer therefor, and a receiver-hook, of means connected with the receiver-hook for momentarily closing the said circuit-closer upon upward movement thereof, said means failing to operatively engage the circuit-closer upon return movement of the hook.

17. In a telephone system, the combination with a privacy device and busy-signal, a circuit-closer therefor, and a receiver-hook, of means operated by the receiver-hook during its upward movement, and upon upward movement only thereof, to momentarily operate the circuit-closer.

18. In a telephone system, the combination with a privacy device and busy-signal, a circuit-closer therefor, and a receiver-hook, of means connected with the receiver-hook for momentarily closing the said circuit-closer upon upward movement thereof, said means failing to operatively engage the circuit-closer upon return movement of the hook.

19. In a telephone apparatus, the combination with a telephone-hook and an electromagnet arranged to be energized upon the upward movement of the said telephone-hook, of a detent carried by said telephone-hook, and a busy-signal, said detent arranged to be shifted to a position to engage said busy-signal upon upward movement of the telephone-hook, when the said electromagnet is energized.

20. In a telephone apparatus, the combination with a telephone-hook, and an electromagnet adapted to be energized upon the upward movement of the said hook, of a pivoted detent carried by said hook, a connection therefrom to the armature of said electromagnet, and a busy-signal arranged to be engaged by said detent during the upward movement of the telephone-hook, when said electromagnet has been energized.

21. In a telephone apparatus, the combination with a pivoted telephone-hook, an electromagnet, and a circuit-closer therefor operated by the telephone-hook in its upward movement, of a busy-signal loosely pivoted coincidently with said telephone-hook, a de-

5 tent carried by said telephone-hook, said de-
tent arranged to be operated by the said elec-
tromagnet, and, when so operated, to engage
the busy-signal upon upward movement of
the said hook to set the busy-signal.

10 22. In a telephone system, the combina-
tion with a generator, two conductors ar-
ranged to connect with opposite poles there-
of, and a plurality of telephone instruments
each provided with a switch for bridging same
15 in talking-circuit across the said conductors,
of a privacy device for each instrument having
an electromagnet arranged in a normally open
branch connected at its opposite ends to one
20 of the said conductors at two points therein,
and means for momentarily closing and then
opening the branch of any one instrument
prior to the operating of the said switch
thereof.

25 23. In a central-energy telephone system,
the combination with a central-energy gener-
ator, two conductors arranged to connect
with opposite poles thereof, a ground connec-
tion for one pole, and a plurality of telephone
instruments each provided with a switch for

bridging same in talking-circuit across the
said conductors, of a privacy device for each
instrument arranged in a normally open
branch connected at one end to a point be-
tween the said switch and the grounded side 30
of the generator, and at the other end con-
nected with ground, and means for momen-
tarily closing and then opening the said
branch of any one instrument prior to oper-
ating the said switch thereof. 35

24. In a central-energy telephone system,
the combination with a line-circuit and a gen-
erator in normal connection therewith, of a
plurality of telephone instruments and pri-
vacy devices therefor each including an elec- 40
tromagnet, and means for electrically con-
necting the electromagnet for the privacy de-
vice of any one instrument with the line, only
while another instrument is in use.

In witness whereof I have hereunto set my 45
hand this 15th day of August, 1904.

EGBERT A. REYNOLDS

Witnesses:

FRANK B. VERMILYA.

D. A. REYNOLDS.