

J. W. BLACK.

SIGNAL TUBE APPARATUS.

No. 347,154.

Patented Aug. 10, 1886.

Fig. 1.

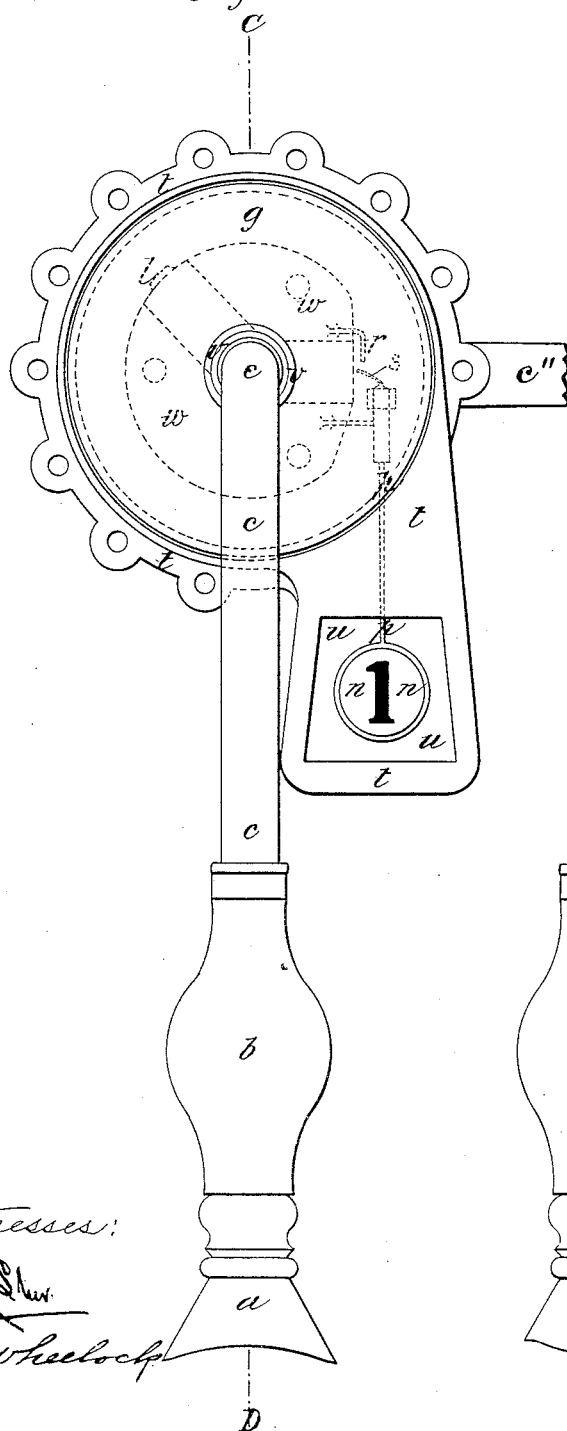
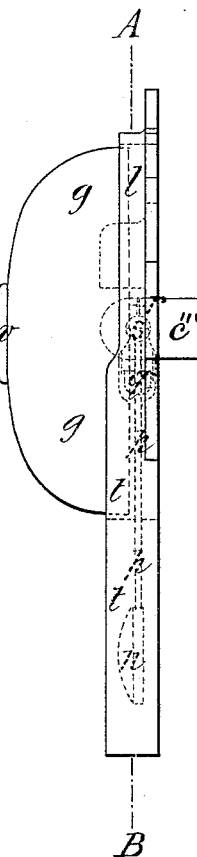


Fig. 2.



Witnesses:

Edward S. Lee

Goodwin Wheelock

Inventor,

J. W. Black

By Knight Bros

Attys

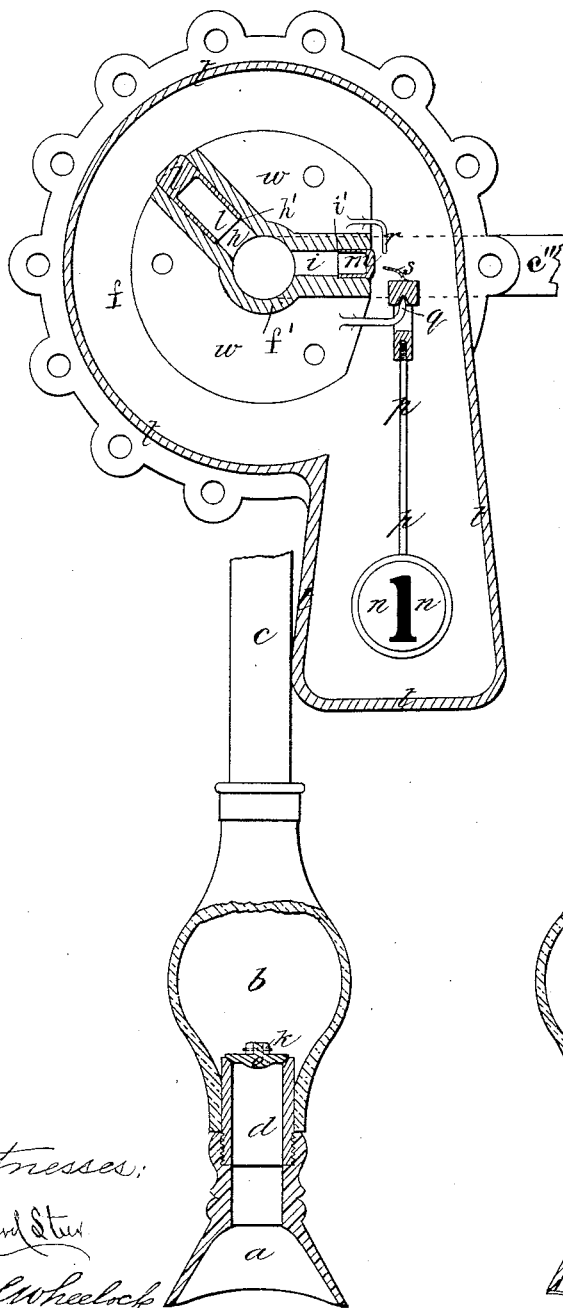
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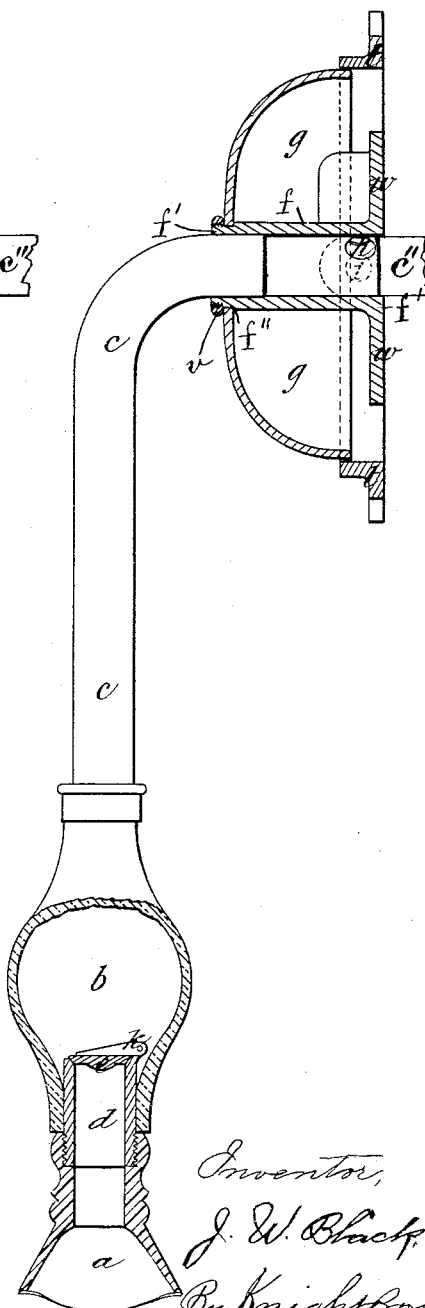
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Fig. 3.



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Fig. 4.



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Fig. 5.

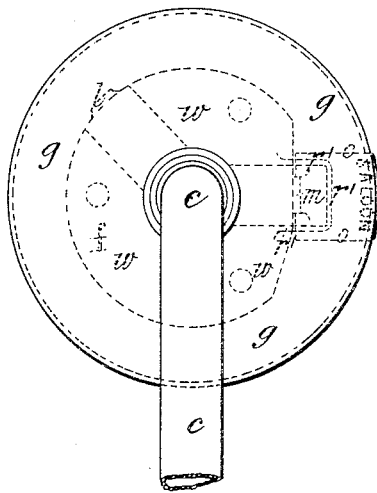


Fig. 6.

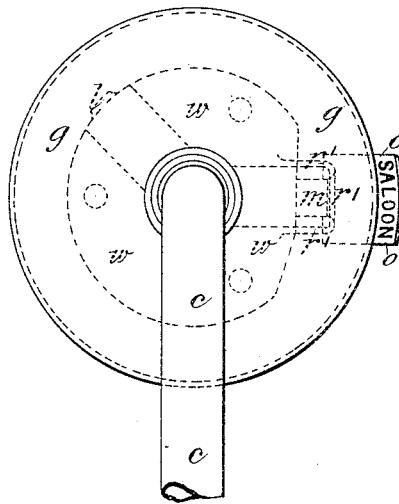
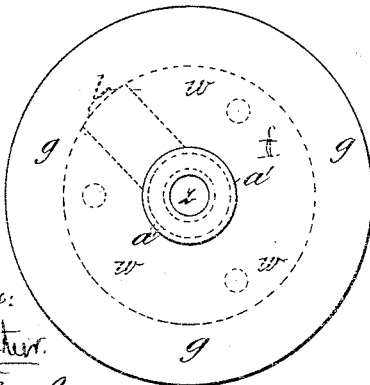
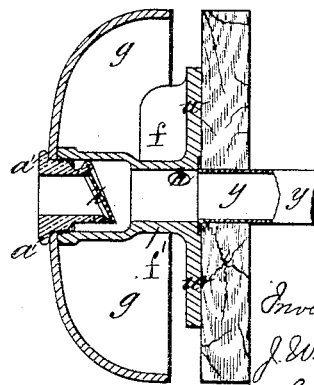


Fig. 7.



Witnesses:  
*Oliver S. Kerr*  
*Geo. L. Wheelock*

Fig. 8.



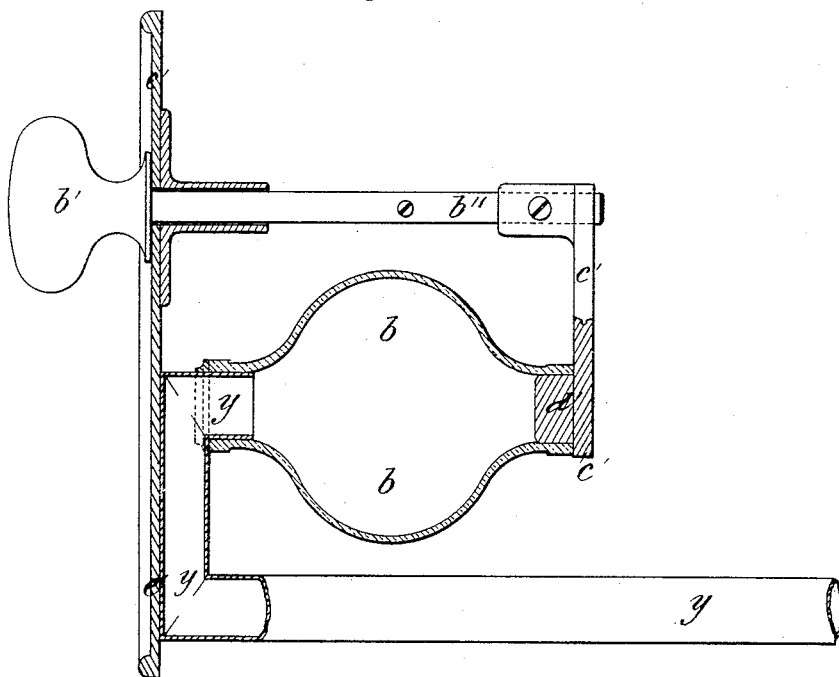
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SIGNAL TUBE APPARATUS.

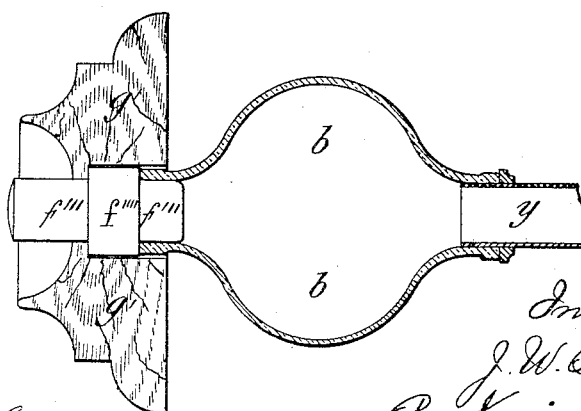
No. 347,154.

Patented Aug. 10, 1886.

*Fig. 9.*



*Fig. 10.*



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOHN WILLIAM BLACK, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

## SIGNAL-TUBE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 347,154, dated August 10, 1886.

Application filed May 25, 1885. Serial No. 166,575. (No model.) Patented in England April 26, 1884, No. 6,855.

*To all whom it may concern:*

Be it known that I, JOHN WILLIAM BLACK, of Glasgow, in the county of Lanark, Scotland, plumber and gas-fitter, have invented new or  
5 Improved Signal-Tube Apparatus, of which the following is a specification.

This invention is the subject-matter of English Patent No. 6,855, dated April 26, 1884, and sealed April 17, 1885.

10 My invention has for its object to provide an improved signaling device for signal-tube apparatus.

My improvement consists, first, in a signaling device comprising a bracket formed with  
15 a section of a signal-tube, and with a branch pipe, a piston in the branch pipe, a signal arranged to be acted on by the piston, a collapsible chamber, and a tube connecting the collapsible chamber with the bracket, as hereinafter described.

My improvement consists, secondly, in a signaling device comprising a bracket formed with a section of a signal-tube, and with  
25 branch pipes, pistons in the branch pipes, an indicator arranged to be acted on by one piston, a sonorous body arranged to be acted on by the other piston, a collapsible chamber, and a tube connecting the collapsible chamber with the bracket, as hereinafter described.

30 My improvement consists, thirdly, in a signaling device comprising a bracket formed with a section of a signal-tube, and with a branch pipe, a piston in the branch pipe, a signal arranged to be acted on by the piston, a collapsible chamber a tube connecting the  
35 collapsible chamber with the bracket, and a mouth-piece, as hereinafter described.

My improvement consists, fourthly, in a signaling device comprising a bracket formed  
40 with a section of a signal-tube, and with a branch pipe, a piston in the branch pipe, a stop limiting the movement of the piston, a signal arranged to be acted on by the piston, a tube leading to the bracket, and an air-compressing device, as hereinafter described.

45 My improvement consists, fifthly, in combining with a bracket formed with a section of a signal-tube, and with a branch pipe having a piston, a center or pivot, a pendulum-rod, an arm, an indicator, and a stop, as hereinafter described.

In the drawings, Figure 1 is a front elevation of one form of signaling-tube apparatus constructed according to this present invention. Fig. 2 is a side elevation of a similar  
55 apparatus located at the other end of the tube. Fig. 3 is a view of the same apparatus, partly in front elevation and partly in vertical section, taken on the line A B, Fig. 2. Fig. 4 is a view of the same, partly in side elevation and partly in transverse vertical section, taken on the line C D, Fig. 1. Fig. 5 is a  
60 modification showing a front elevation of a gong wherein the indicator connected therewith is concealed; and Fig. 6 is a similar view with the indicator exposed, as hereinafter described. Figs. 7 and 8 are respectively a front elevation and a transverse section of another form of gong constructed according to this present invention. Figs. 9 and 10 are  
70 longitudinal sections, respectively, through a bell-pull and a bell-push or press-button, constructed according to this present invention.

Referring to Figs. 1, 2, 3, and 4, *f* is a bracket arranged within a bell or gong, *g*, formed with  
75 a section, *f'*, of the signal-tube, and with a branch pipe, *h*, and a branch pipe *i*. The section *f'* on its inner side receives the end *c''* of the signal-tube, while to the outer side is connected a flexible tube, *c*, provided with a col-  
80 lapsible chamber, *b*, having a mouth-piece, *a*. The collapsible chamber *b* is composed of india-rubber or other elastic material, and is connected with the said mouth-piece *a*, preferably by a coupling-tube *d*, provided with a hinged  
85 valve, *e*, hereinafter more fully described. The flexible tube is cemented or otherwise secured into the bracket. The valve *e* is hinged at *k* to the coupling-tube *d*, hereinbefore referred to, and constituting at its upper part  
90 the seat whereon the said valve rests. The collapsible chamber *b* and mouth-piece *a*, by reason of their connection to the flexible tube *c*, hang or have a tendency to hang vertically downward, so that the valve *e* is normally  
95 closed, and when the said mouth-piece *a* is raised to about the level of the speaker's mouth the said valve *e*, by virtue of gravity, opens upon its hinge *k*.

The branch pipe *h* contains the cylindrical  
100 striker or piston *l*, these parts being preferably arranged at or about an angle of forty-

five-degrees. A shoulder, *h*, or other suitable form of stop is provided within the pipe *h*, to allow the striker or piston *l* to rest thereon, this striker or piston *l* being that by which the bell or gong *g* is struck and sounded.

The branch pipe *i* contains the striker or piston *m*, which seats against a shoulder, *i'*, and operates the indicator *n*, Figs. 1 to 3, inclusive, and the indicator *o*, Figs. 5 and 6, of the annexed drawings. These indicators are employed where a number or series of call-bells or gongs or signal-tube apparatus are arranged at one place or station, so that by referring to these indicators it is at once seen which of the bells or gongs have been sounded or along which tube the attendant is required to make communication.

The form of indicator shown at Figs. 1 to 3, inclusive, is that which is especially applicable to private dwelling-houses, hotels, offices, or other buildings. This indicator consists of the striker or piston *m*, hereinbefore referred to, which is caused, on being forced outward, to deflect the pendulum-rod *p* from its normal vertical position, and so to cause it to oscillate upon the center or pivot *q*, upon which it is suspended. The striker or piston *m* is prevented from being forced completely out of the pipe *i* by means of the wire *r*, or by any other equivalent stop. The arm *s*, against which the striker or piston *m* strikes, is preferably of a width (see Fig. 2) sufficient to extend across the guard-chamber and prevent the indicator *n* and pendulum-rod *p* rotating crosswise upon the center or pivot *q*. The indicator *n* and its connected parts, as also the working parts of the bell or gong *g*, are covered by the guard *t*, and the movements of the indicator *n* are seen through the glass *u*, provided in such guard. The bell or gong *g* is secured against a shoulder, *f''*, formed on the outside of the tube-section *f'* by the nut *v*, and the whole apparatus it is intended should be secured by the plate *w* and guard *t* at a convenient height directly against the wall of the building or indirectly to a wooden block secured to such wall.

The form of indicator represented at Figs. 5 and 6 of the annexed drawings is that which is especially applicable for use in ships, railway-trains, and other such like traveling structures. This indicator consists of the plate *o*, upon which is marked the number corresponding to (as in Figs. 1 to 3, inclusive) or the name of the compartment or chamber with which the said bell or gong communicates, as represented at Figs. 5 and 6. This plate *o* is secured to the striker or piston *m*, whose outward motion is limited by the wire *r'*, or by any other equivalent stop. The length of the plate *o* and the position of the number or name marked thereon is such that when in its normal position the said number or name is concealed beneath the lower edge of the bell or gong *g*, as shown at Fig. 5, while on being forced outward the said number or name is

exposed at the outside of such edge, as shown at Fig. 6. The plate *o* is returned to normal position by merely pressing on the outer end thereof.

When it is desired to provide a bell or gong simply for the purpose of calling attention to any one part of a building or structure, and not for the purpose of verbally communicating through a signal-tube, such call-bell is constructed in the manner represented at Figs. 7 and 8 of the annexed drawings. This bell or gong when employed among a number or as one of a series of such bells may be provided with an indicator of either of the forms hereinbefore described with reference to the annexed drawings, or when so used, and for any particular station—such, for example, as a hall-door—the bell or gong *g* may be of a musical note or pitch peculiar to itself, and therefore render an indicator unnecessary. This arrangement of call bell or gong is connected to the pipe *y*, which communicates with the calling-station, and is provided with the branch pipe *h* and striker or piston *l*, substantially the same as is hereinbefore described. The front or forward end of the bracket *f* is provided with the valve *z*, opening inward, and preferably screwed to the inside of such bracket, the collar or projection *a'* securing the bell or gong *g* against the end thereof.

The call arrangement herein last described, and shown at Figs. 7 and 8 of the annexed drawings, when employed without an indicator or signal-tube attachment, may be secured at the upper part of a room or other compartment by means of a plate, *w*, and may therefore dispense with the guard *t* or other protecting cover.

A form of bell-pull suitable for a front or hall door and used in connection with the call bell or gong *g*, Figs. 7 and 8, is represented in longitudinal section at Fig. 9. This arrangement consists of the handle *b'* and rod *b''*, similar to that in use for ordinary house-bells, and having the arm *c'* secured thereto. This arm is provided with the plug *d'*, fitting air-tight into one end of the collapsible chamber *b*, the opposite end of which is cemented or otherwise suitably secured to the pipe *y*, the other terminal of which is shown at Fig. 8, and which may be bracketed or secured against the front plate, *e'*, by clips or other equivalent means. The bell-push or press-button represented in longitudinal section at Fig. 10 of the annexed drawings is that which I prefer to employ for connecting the call bell or gong, Figs. 7 and 8, with any compartment or chamber of a dwelling-house, hotel, office, ship, or other structure. The press-button *f'''* is formed with a portion, *f''''*, of an increased diameter, to prevent it passing outward through the block *g'*, and which also makes an air-tight joint with the collapsible chamber *b*, into the forward end of which the said button *f'''* is cemented or otherwise secured, while the rearward end of the said

chamber *b* is cemented to the pipe *y*. (See also Fig. 8.)

When it is desired to ring or sound the bell or gong *g*, at one end of a signal-tube provided with the apparatus represented at Figs. 1 to 4, inclusive, of the annexed drawings, it may be effected either by compressing by hand the collapsible chamber *b*, or, when raised into a position convenient to the mouth of the speaker, by blowing through the mouth-piece *a*. The valves *e* at the two ends of the signal-tube having automatically opened while being raised leave the communication between the two terminals thereof unimpeded. The air moving along the signal-tube causes the distant bell or gong *g* to be struck by its piston *l*, and operates its indicator, as hereinbefore described. The air which is necessary for the return of the collapsible chambers *b* into their normal extended condition after having been compressed passes in through the valves *e*. The moving air caused by the pulling outward of the handle and rod *b'*, Fig. 9, or by the pushing inward of the press-button *f'''*, Fig. 10, and the consequent compression of the collapsible chambers *b*, causes the bell or gong *g* to be struck by the striker or piston *l*, the air necessary for the return of the collapsible chamber *b* to its normal extended condition passing inward through the valve *z*, Figs. 7 and 8.

I claim—

1. The combination of a bracket formed with a section of a signal-tube, and with a branch pipe, a piston in the branch pipe, a signal arranged to be acted on by the piston, a collapsible chamber, and a tube connecting the col-

lapsible chamber with the bracket, substantially as described.

2. The combination of a bracket formed with a section of a signal-tube, and with branch pipes, pistons in the branch pipes, an indicator arranged to be acted on by one piston, a sonorous body arranged to be acted on by the other piston, a collapsible chamber, and a tube connecting the collapsible chamber with the bracket, substantially as described.

3. The combination of a bracket formed with a section of a signal-tube, and with a branch pipe, a piston in the branch pipe, a signal arranged to be acted on by the piston, a collapsible chamber, a tube connecting the collapsible chamber with the bracket, and a mouth-piece, substantially as described.

4. The combination of a bracket formed with a section of a signal-tube, and with a branch pipe, a piston in the branch pipe, a stop limiting the movement of the piston, a signal arranged to be acted on by the piston, a tube leading to the bracket, and an air-compressing device, substantially as described.

5. The combination, with a bracket formed with a section of a signal-tube, and with a branch pipe having a piston, of a center or pivot, a pendulum-rod, an arm, an indicator, and a stop, substantially as described.

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

JOHN WILLIAM BLACK.

Witnesses:

ST. JOHN VINCENT DAY,

ROBERT ADAM GUNN,

*Both of 115 St. Vincent Street, Glasgow.*