(No Model.) 3 Sheets—Sheet 1.

S. P. HASEY.

PNEUMATIC ALARM DEVICE.

No. 493,265. Patented Mar. 14, 1893.

FIG. 2.

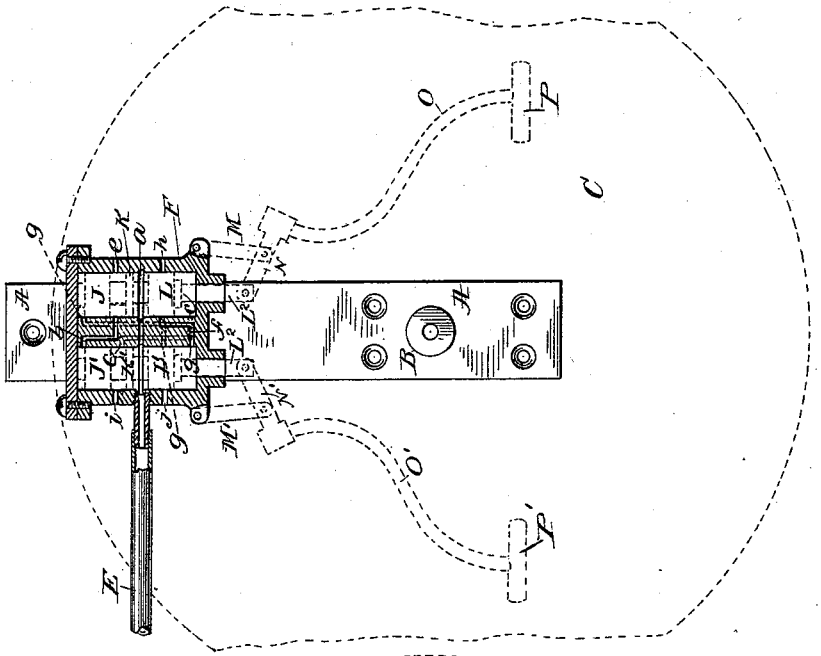


FIG. 3.

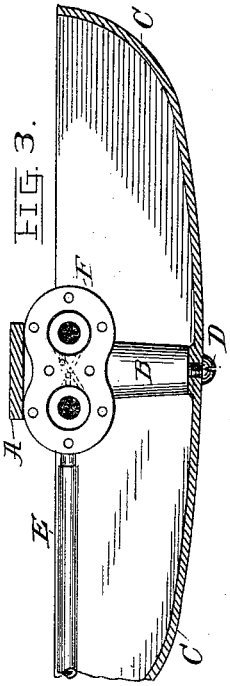
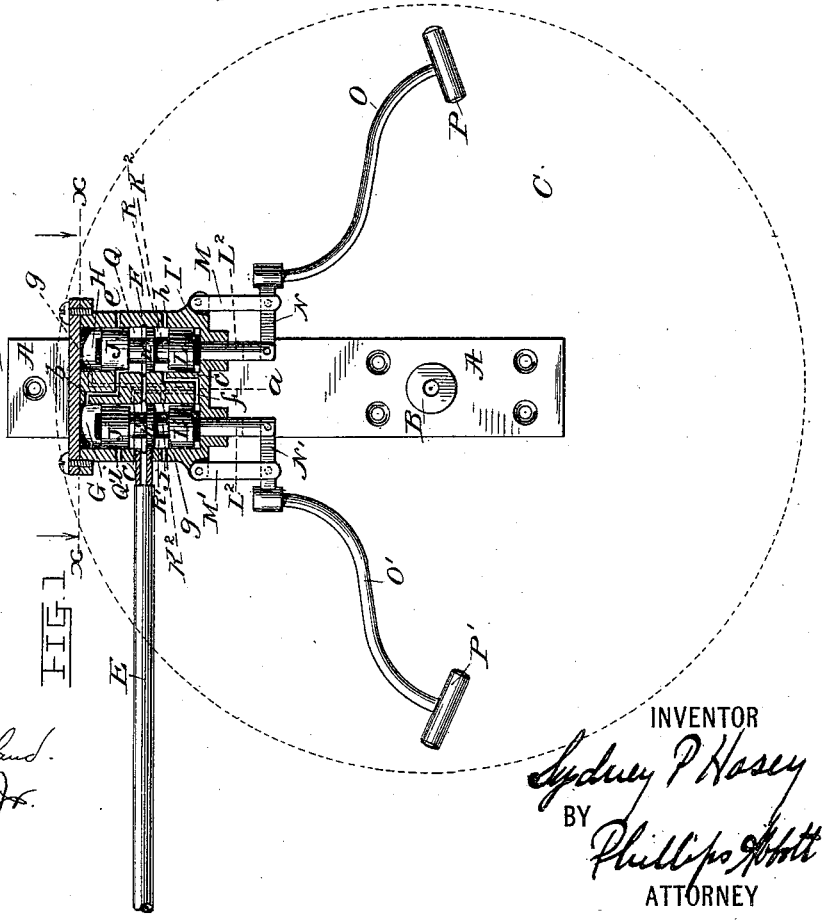


FIG. 1.



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(No Model.) 3 Sheets—Sheet 2.

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PNEUMATIC ALARM DEVICE.

No. 493,265. Patented Mar. 14, 1893.

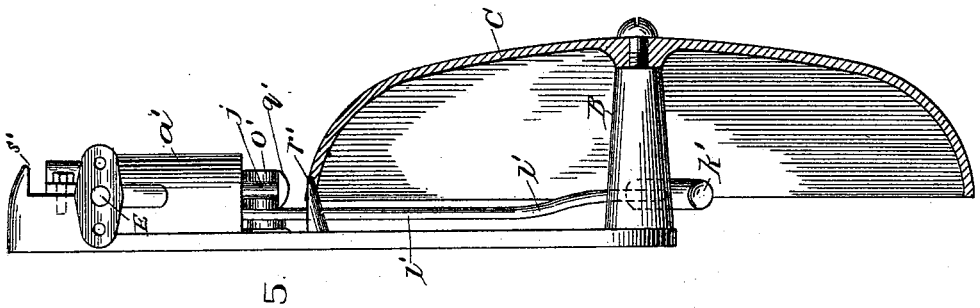

FIG. 5.

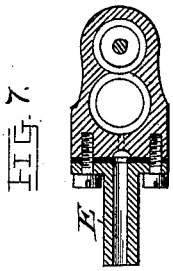

FIG. 7.

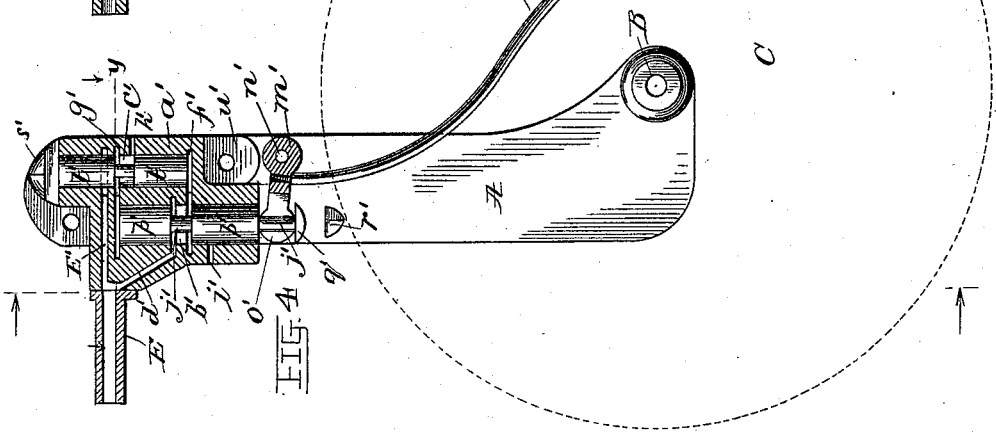

FIG. 4.

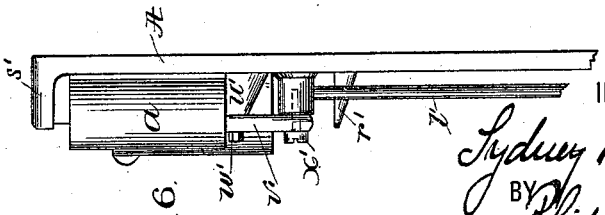

FIG. 6.

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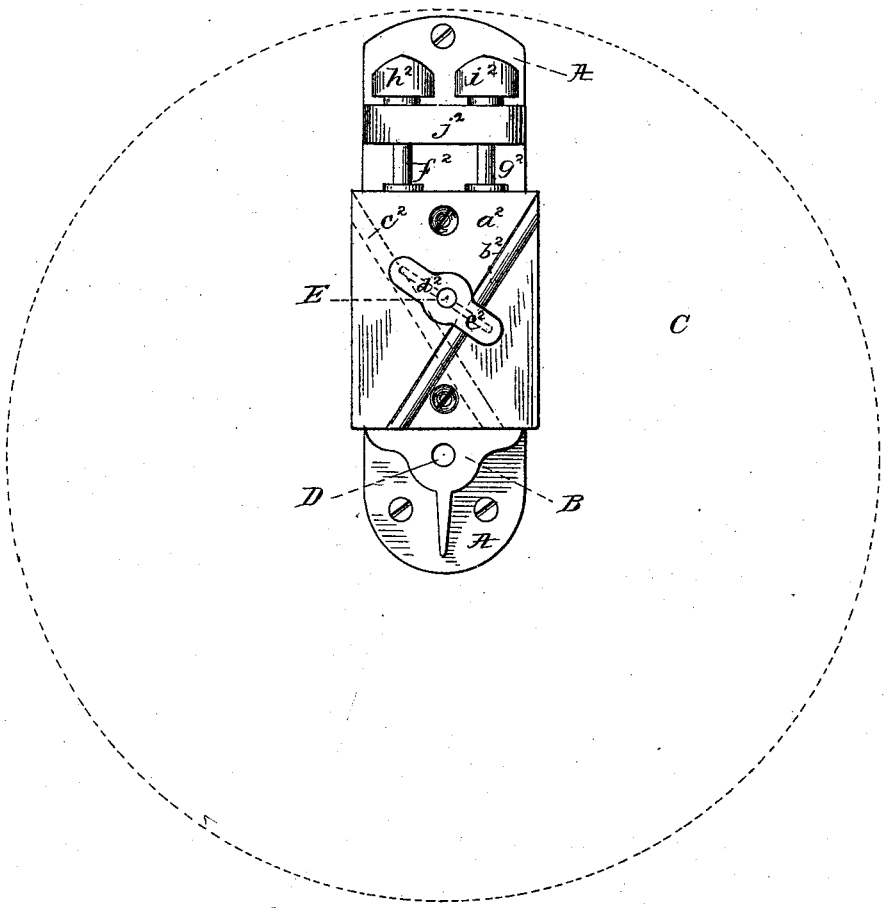
(No Model.) 3 Sheets—Sheet 3.

S. P. HASEY.

PNEUMATIC ALARM DEVICE.

No. 493,265. Patented Mar. 14, 1893.

FIG. 8.



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UNITED STATES PATENT OFFICE.

SYDNEY P. HASEY, OF NEW YORK, N. Y.

PNEUMATIC ALARM DEVICE.

SPECIFICATION forming part of Letters Patent No. 493,265, dated March 14, 1893.

Application filed October 7, 1892. Serial No. 448,100. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY P. HASEY, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented a certain new and useful Improved Pneumatic Alarm Device, of which the following is a specification.

My invention relates to improved devices for giving alarms or sounding calls: in other words, improvements in devices known as alarm or call gongs or bells; and the special feature of my invention consists in the fact that it is adapted to be operated by pneumatic pressure. Heretofore such apparatus so far as I am aware have been operated by electricity, by hand or by clock work. I am aware, however, that there have been attempts made to operate alarms by pneumatic apparatus, but so far as I am informed there has never been any practically operative device of this class made.

By my invention I combine mechanical elements in such manner that air under pressure acts automatically to reciprocate a piston or pair of pistons, as the case may be, to the rod of which the hammer or striking device whatever it may be is attached or engaged, and my apparatus is so constructed that it is practically indestructible as much so I mean as any piece of mechanism of this class can be and it is exceedingly sure in operation. In these respects my apparatus is as I think much more desirable because it is entirely free from electrical connections, springs, clock work, and all the other features of the old forms which being exceedingly liable to get out of order, injuriously affected the durability and the accuracy and durability of operation of the device.

In the drawings hereof, Figure 1, illustrates an elevation partly in section of the invention. Fig. 2, is a like view showing the parts in their reciprocated positions. Fig. 3, is a plan partly in section on the line x, x, of Fig. 1, taken on the line of the arrows. Fig. 4, is an elevation partly in section of an alternative construction. Fig. 5, is an elevation, the gong only being in section, viewed from the left as shown by the arrows in Fig. 4. Fig. 6. is an elevation taken from the right of Fig. 4. Fig. 7. is a cross-section taken on the line Y, Y, of Fig. 4, and in the direction of the arrows. Fig. 8, is an elevation of a modified construction.

Referring first to Figs. 1, 2 and 3,—A is a base preferably of metal, whereby the apparatus may be screwed or otherwise fastened to a wall or other suitable support. B is a standard fastened to the base and which supports the gong C. by screw D or other suitable means as already well understood. E is the air inlet pipe, it connects with any suitable reservoir of compressed air, or its equivalent, gas of any kind or any expansive fluid may be used. In fact water may be employed instead of air, although I prefer air as indicated by the words pneumatic alarm device. F is a casting comprising two cylinders G and H. I, I′ are pistons moving through the cylinders; they are composed of three sections; an upper section J, J′, a middle section, K, K′ and a lower section L, L′. They being connected by the piston rods K^2 as shown. L^2 are extensions of the piston rods which project through the ends of the cylinders as usual and may be provided with such stuffing boxes as desired, although ordinarily none will be necessary, especially for pneumatic apparatus. M, M′ are two links pivoted at one end to the casting F as shown, and at the other end they are respectively pivoted to short arms N and N′ of the hammers O, O′. P, P′ are the hammers on the ends of the hammer arms O and O′. The sections of the pistons J, K and L and J′, K′ and L′ are separated by two chambers Q and Q′ and R and R′, and these chambers and also the spaces at each end of the pistons between them and the ends of the cylinders are connected by certain ports which it will be more convenient to describe during the explanation of the operation of the device.

The operation of the apparatus as thus far explained is as follows:—The air or other fluid enters the pipe E, the parts being in the position shown in Fig. 1. It enters first the compartment Q′ of the left hand cylinder. It then passes through the unoccupied space between the sections of the pistons J′ and K′ and passes through a port a into the space Q in the right hand cylinder. Then it passes through the port b up into the space between the section J′ of the left hand piston and the

end of the left hand cylinder. It also passes through a port *c* into the space between the section L of the right hand piston and the end of the right hand cylinder. It will thus be seen that there is pressure above the section J in the piston in the left hand cylinder and also in the unoccupied space Q in the right hand cylinder and below the section L of the right hand cylinder, but the left hand piston cannot move since it is already at the end of its down stroke, also the pressure in the section Q nullifies itself against the opposing faces of the sections J and K of that piston, but the pressure below the section L of the right hand piston does exert moving power upon that piston and it is lifted; thereby drawing the right hand hammer inwardly as shown in Fig. 2. As soon as the right hand piston reaches the limit of its up stroke, then the section K of that piston has traversed from the underside to the upperside of the admission port *a* and the exhaust port *e* in the right hand cylinder is exposed, consequently the fluid which was above the section J′ of the left hand cylinder can now return through the port *b*, the unoccupied space Q and out at the exhaust port *e*. Meantime the fluid under pressure has now entered the vacant space R between the opposing faces of the sections K and L of the right hand piston, and from that space passes through a port *f* into the space between the section L′ of the left hand piston and the end of that cylinder, and since the pressure in the cylinder above the section J′ of the left hand piston has as stated been removed, consequently the left hand piston is in turn lifted which draws in the left hand hammer P′ in the same manner that the hammer P had previously been drawn in. During the described movement of the left hand piston, the section K′ of it is transferred to the other side of the inlet port from the pipe E, consequently the fluid entering the unoccupied space R′ of the left hand piston, passes through the admission port *a* into the right hand cylinder the same as before, and it also passes through a port *g* which connects the space R′ with the space above the section J of the right hand piston. Consequently there is pressure applied above the right hand piston the pressure between the sections K and L of that piston escaping through the exhaust port *h*. Thus the parts are returned to their original position. *i*, *j* are two exhaust ports for the left hand cylinder which coincide in location and function with the exhaust ports *e* and *h* of the right hand cylinder which have already been described.

From the foregoing it will be seen that by the simple admission at one point, that is to say at the end of the tube E of any suitable fluid under pressure, the pistons are caused to automatically admit, cut off and exhaust the fluid into their respective cylinders in such manner as to effect a very rapid reciprocation of the two pistons whereby of course, the hammers actuated by them are caused to act rapidly and forcibly upon the gong C and it will be observed also that in my apparatus the most simple mechanical parts are employed. There is no great nicety in the construction and they are free from springs, electrical connections, clock work, or any other sensitive or easily deranged mechanical features.

In Figs. 4, 5, 6 and 7, I show a modified construction of my apparatus in which a single hammer only is used, and which is not only considerably less expensive, but is also or may be more compact than the form shown in Figs. 1, 2 and 3. In these figures, *i. e.* 4, 5, 6 and 7, A is the base piece, B is the post, C is the gong and E is the inlet pipe. All of these parts are or may be the same as those referred to in the preceding figures and consequently are given the same letters. *a′* is a casting attached in any suitable manner to the base A, in it are two cylinders *b′* and *c′*.

d′ e′ f′ and *g′* are all of them ports through which the fluid passes and *h′* and *i′* are two exhaust ports; *j′* is the piston rod for the left hand piston which alone actuates the hammer, *k′*, which is attached to the hammer arm *l′* which is in turn attached to a pivoted or rocking lever or arm *m′* it being pivoted at *n′* to a post on the frame the free end of which engages with the piston *j′*, by ordinary rolling joint, there being a head *o′* on the arm *m′* which rolls or slides between the end of the piston *p′* and a head or disk *q′* on the end of the piston rod *j′*. *r′* is a stop which determines the movement of the piston *j′* outwardly and *s′* is another stop which determines the movement of the other piston *t′* upwardly. *u′* is a projecting piece on the base *a′* to which a piece of metal *v′* is screwed as by bolt or screw *w′*, and at the other end of it a bolt or screw *x′* passes down through it, the stem of the screw *x′* acting as a pivot *n′* of the rocking arm *m′*.

The operation of this modified form of the invention is as follows. The fluid enters the pipe E in the same manner as in the apparatus heretofore described; it passes through the port *e′* but making no connections results in nothing. It also passes through the port *d′* through the vacant space *b′*, through the port *f′* beneath the right hand piston *t′* and lifts that piston, the upper end whereof is arrested by the stop *s′*, but in the shifted position of the right hand piston, the vacant space *c′* comes coincident with both of the ports *g′* and *e′*, consequently the fluid passing through the vacant space *c′* and the port *g′* exerts pressure on the top of the upper portion of the left hand piston *p′* whereby that piston is depressed, the rocking arm *m′* is rotated and the hammer carried against the gong or bell. Also entrance of the fluids through the port *d′* is cut off by the descent of the left hand piston, and the port *i′* is exposed by reason of the vacant space *b′* coinciding with the exhaust port *i′* and with the port *f′*. Conse-

quently the pressure under the lower section of the right hand piston t' being released through the exhaust i', the right hand piston drops by action of gravity, returning that piston to its normal position and exposing the exhaust port h', whereupon pressure on the upper section p' of the left hand piston is in turn released through the exhaust h', and the weight of the hammer, in other words gravity, again lifts the left hand piston p' returning it to its normal or initial position; thus securing a reciprocation of the parts.

It will be seen that this form of my invention is even more simple than that already described, and that its continued operation, its accuracy and reliability is as well assured as anything well can be in devices of this construction, and I wish here to state that the parts composing my apparatus should be made of suitable material, *i. e.* materials which are not liable to atmospheric or other action of a kind calculated to interfere with their continued operation; that is to say, brass or copper are very good materials but hard rubber or aluminium or Babbitt metal will in certain places be superior.

In Fig. 8, I show still another form of my invention, in which the ends of the pistons themselves act as the hammers, which strike against the gong. In this case, as in the others, A is the base plate, B is the post upon which the gong C is supported by a screw or other suitable device which enters a threaded hole D. in the post B. a^2 is the casting in which there are two cylinders having ports which may be substantially the same as that shown in Fig. 1. That is to say, b^2 and c^2 are the connecting ports and d^2 and e^2 are the inlet ports. E is the main inlet pipe corresponding to the pipe E in the other figures. f^2 and g^2 are the two pistons upon the ends of which are two heads or strikers h^2, i^2. The piston rods respectively pass through a guide j^2 which steadies and supports them. The heads h^2 and i^2 being reciprocated as before described, alternately strike the gong C.

It will be apparent to those who are familiar with this art that various modifications may be made in the details of construction of my apparatus, and still the essential features of my invention be embodied. I therefore do not limit myself to the exact details.

I claim—

1. The combination with the sounder and hammer of an alarm device of two cylinders each provided with a piston, a single inlet port, ports connecting with said inlet port and connecting the two cylinders, other ports opening into the cylinders near their respective ends, which connect with exhaust ports, and means substantially as described for connecting the piston rods with the hammer.

2. The combination with the sounder and hammer of an alarm device of two cylinders, each provided with a piston, said pistons composed of a plurality of sections, a single inlet port, ports connecting with the spaces between the sections of the pistons, and also connecting the two cylinders, other ports which connect with the cylinders near their ends respectively and with exhaust ports through the spaces between the sections of the pistons and means substantially as described for connecting the hammer with the piston rods.

3. The combination with the sounder and hammer of an alarm device of two cylinders, each provided with a piston, a single inlet port, ports connecting the two cylinders midway of their ends, other ports connecting the two cylinders, one end of each of which opens at or near the end of one of the cylinders, and exhaust ports through the sides of the cylinders, the whole being constructed and arranged so that each piston acts as a slide valve to control and direct the circulation of the fluid, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 5th day of October, A. D. 1892.

SYDNEY P. HASEY.

Witnesses:
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J. E. HOFFMAN.