

F. H. SLEEPER.
 SIGNAL MECHANISM.
 APPLICATION FILED JULY 2, 1910.

1,242,058.

Patented Oct. 2, 1917.

Fig 1

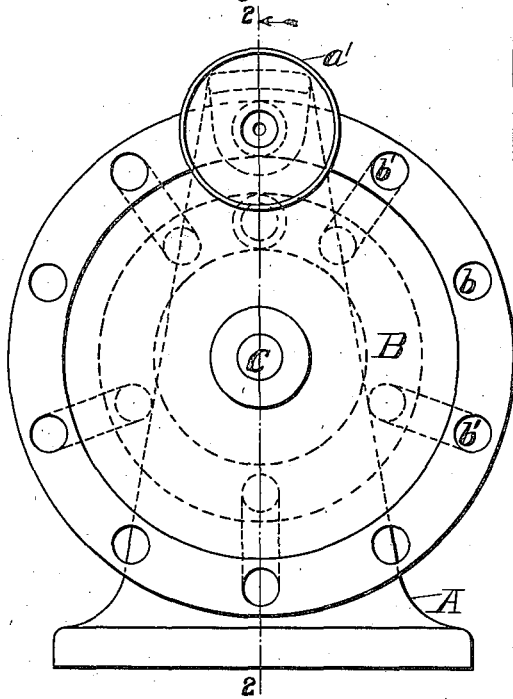


Fig 2.

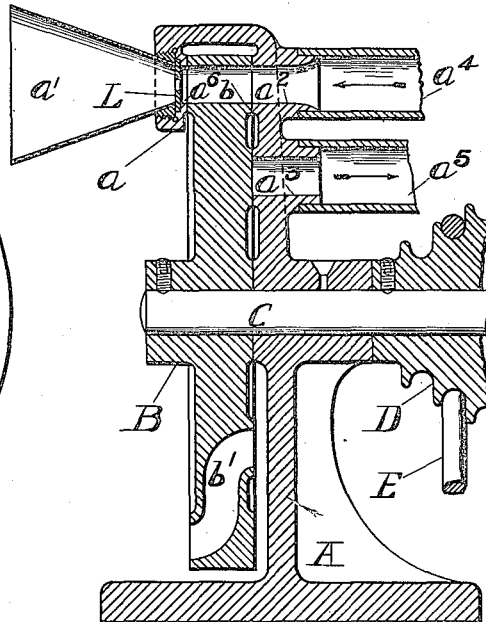


Fig 3

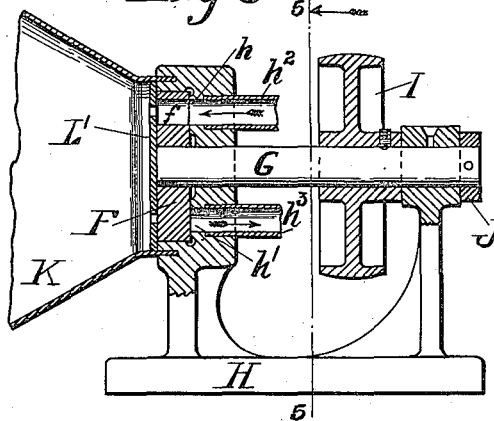


Fig 4

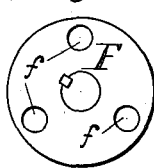
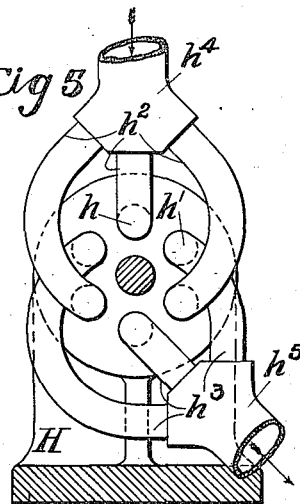


Fig 5



WITNESSES:

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SIGNAL MECHANISM.

1,242,058.

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To all whom it may concern:

Be it known that I, FRANK H. SLEEPER, a citizen of the Dominion of Canada, residing at Worcester, county of Worcester, and State of Massachusetts, have invented a new and useful Improvement in Signal Mechanism, of which the following is a specification.

My invention relates to that class of signal devices used for audible marine and aerial signaling; for fog warning and the like in connection with coast and lighthouse service; and for alarm purposes in marine and aerial landing and departure stations.

In mechanisms of this class it is not only very desirable that they consist, mechanically, of the minimum of parts, so as to avoid complications in operation and the correspondingly increased risks of breakdown, but it is also of great importance that the signal tone be produced at a known and unvarying pitch so as to permit of ready recognition.

Another very desirable feature in connection with devices of this kind is the ability to control the pitch of the signal tone produced, so that the device may be, at will, quickly adjusted to produce such tones as may be from time to time required.

The object of my invention is to provide a reliable and easily controlled signal device of simple construction, wherein the sounds are produced by means of air or other elastic medium, and are maintained unvaryingly during the signal period at the desired pitch; and which is provided with means whereby the necessary adjustments to produce other tones in any variety of pitch at will may be quickly and readily effected.

More particularly, and in the form shown in the drawings herewith, my invention comprises a signal device wherein air is oscillated at any desirable rate through one or more openings, thus creating a sound the pitch of which is determined by the periodicity of the oscillations, together with means whereby this periodicity of the air oscillations is controlled and adjusted at will.

By alternating or reversing the fluid vibration which produces the signal tone, and by providing means to vary the vibratory period, I am enabled to produce, continuously, clear and sustained signal tones of any desired definite pitch, with less wave interference and in a more economical man-

ner than by any other method now known to me.

I, therefore, claim this invention broadly in any of the many equivalent forms in which it may be shown or produced.

This invention is capable of many modifications in use, and it may be applied to perform a great variety of useful purposes under widely varying conditions.

In the drawings herewith I have selected one form for illustrative purposes, and it is to be understood that I do not restrict myself to those precise mechanical forms and movements in the terms of which my invention is therein expressed. Manifestly, the skilled designer may vary these forms and movements very widely without departing from the essential spirit of my invention and without effecting material change in the results produced.

Referring to the drawings:—

Figure 1 represents a front elevation of a signal mechanism embodying my invention.

Fig. 2 is a vertical cross-section on the line 2—2 of Fig. 1.

Fig. 3 is a view in vertical section of an alternative form, and

Fig. 4 is an elevation showing in detail one of the parts thereof.

Fig. 5 is a cross-section taken on the line 5—5 of Fig. 3, looking in the direction of the arrow.

Referring to Figs. 1 and 2, A represents a frame or body on which the disk B is mounted for rotation by means of the shaft C. D represents a stepped driving pulley, secured to the opposite end of the shaft C, and E indicates the driving belt.

In this case I form the upper part of the frame A so as to extend over the disk B and provide the part so formed with a depending flange, a , through which flange an opening a^0 is formed. A horn, a' , may be secured upon this flange so as to communicate with the opening, as shown, or in any other suitable or convenient manner, so as to concentrate and direct the tone.

Openings b and b' are formed alternately through the disk B, these openings connecting the opening a^0 in the flange a with the openings a^2 and a^3 in the frame A alternately and successively as the disk B is caused to rotate. To the openings a^2 and a^3 in the frame A, the pipes a^4 and a^5 are con-

5 nected in any suitable manner, these pipes leading to any convenient source of air pressure and vacuum, as, for instance, the outlet and inlet of a blower or fan of the usual commercial type.

It will now be manifest that, as the disk B is caused to rotate (through connection to a motor of any of the usual kinds) the opening *b* in it registers momentarily with the opening *a*² in the frame A and establishes connection between it and the opening *a*⁶ placed opposite to it in the frame or flange *a*, so that air under pressure in the opening *a*² is forced outwardly in the direction indicated by the arrow in Fig. 2, through the transverse opening *b* in the disk B and through the opening *a*⁶ in the flange *a*. It will also be apparent that, as the disk B continues to rotate, the opening *b*¹ is brought next into register with the opening *a*⁶, the form of *b*¹ being such however that its opposite end registers with the opening *a*³ in the frame, so that the air in *b*¹ and *a*⁶ is drawn inwardly by the vacuum maintained in the opening *a*³ and its connecting pipe as indicated by the arrow in Fig. 2.

The rotating disk is thus seen to alternately permit and interrupt the flow of air in each direction in the discharge opening, producing therein an oscillatory movement of the air column with a resulting sound or tone.

And, since the pitch of the signal tone thus produced will depend upon the number of oscillations in any given period of time, it will be evident that the speed at which the disk is rotated will control the oscillatory period and, consequently, the pitch of the tone.

The rotation of the disk may be controlled in any desired or suitable manner, by a gear train, or by any one of the well-known forms of gear-changing, variable speed devices, or speed-changing devices, or, in a simpler manner as by the stepped pulley shown in Fig. 2, to which is connected any form of motor drive by means of a driving belt.

50 In an alternative form shown in Figs. 3, 4, and 5, a disk F is mounted upon the shaft G, this shaft being supported in bearings formed upon the frame or body H, and a driving pulley I, secured to the same shaft, furnishing a means for driving the disk F at any desired rate of speed. The longitudinal position of the moving parts is maintained by means of the collar J secured to the outer end of the shaft G.

60 The disk F may be formed with a plurality of openings, *f*, as shown in Fig. 4, and

is surrounded by a flange or head formed in any suitable manner upon the frame H, this flange having, as shown in Fig. 5, a like plurality of outlet openings, *h*, and a like plurality of inlet openings, *h*¹, formed through it. Each set of openings in this flange is connected, preferably by branch pipes such as *h*² and *h*³, to two main pipes, as *h*⁴ and *h*⁵, leading, as before, to any convenient source of air pressure and vacuum. Any suitable means for concentrating or directing the tone or sound may be employed, as a horn K, secured to the frame H in front of the openings in the disk F as shown in Fig. 3, or secured in any other suitable or convenient manner as may be desirable.

As the disk F is rotated the air in the openings *f* is moved alternately in opposite directions, creating a sound the pitch of which is controlled by the rotative speed of the disk.

When desired, auxiliary disks L and L', having openings of a greater or a less area than the openings *b* and *f* in the disks B and F, or having special forms of openings for specific purposes, may be mounted, removably or otherwise, in the mechanism as shown in Figs. 2 and 3.

Having thus described my invention, I claim;—

In a signal mechanism the combination of a main frame, a sound transmitting member mounted thereon, two separate sources of differing fluid pressure connected to said frame, a rotor also mounted upon said frame, interposed between said sound transmitting member and said separate sources of differing fluid pressure, and provided with two series of alternating and equally spaced openings therethrough, one series of said openings permitting free passage in one direction for fluid pressure from its source toward the sound transmitting member, and the other series of openings permitting free passage in the reverse direction for the other fluid pressure away from the sound transmitting member, said openings terminating adjacent the sound transmitting member in a common circular plane and being primarily effective in a common plane to control the fluid movements therein.

In testimony whereof I hereunto set my hand in the presence of two attesting witnesses.

FRANK H. SLEEPER.

Witnesses:

MINNA HAAS,

T. LEVERETT NELSON.