Jan. 24, 1956 J. F. FLETCHER 2,732,547

SIREN

Filed June 2, 1953

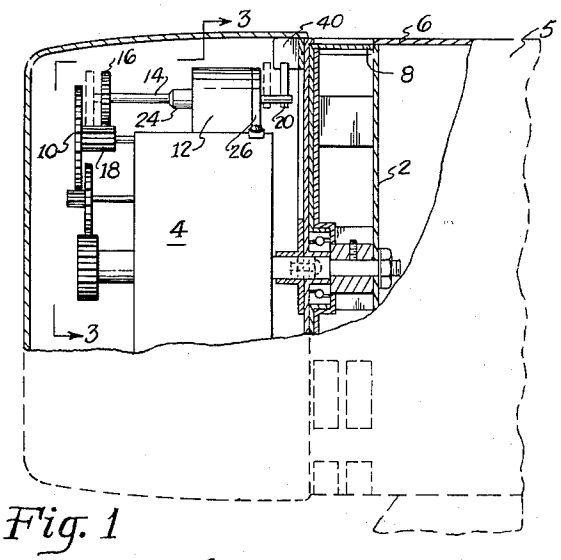


Fig. 1

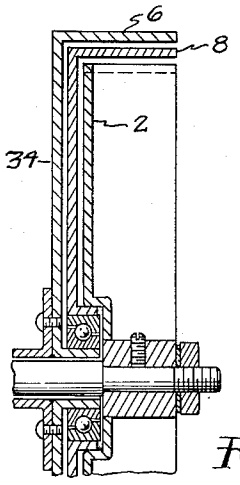


Fig. 2

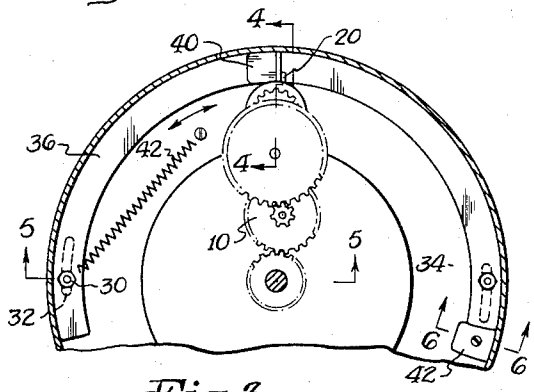


Fig. 3

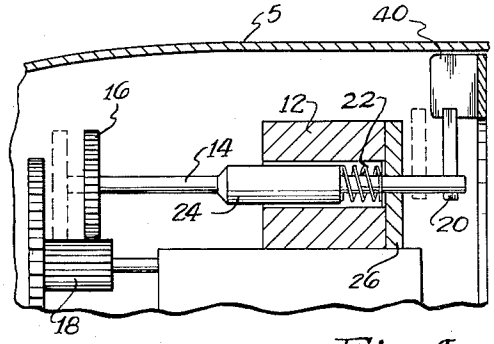


Fig. 4

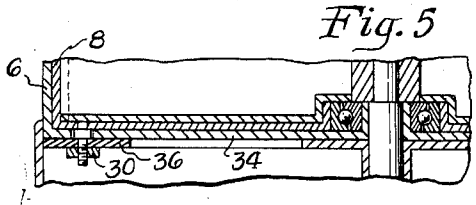


Fig. 5

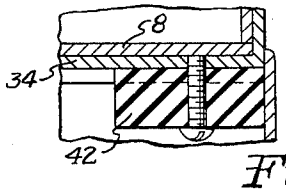


Fig. 6

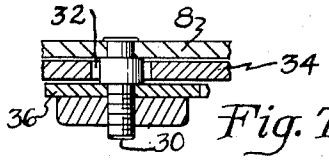


Fig. 7

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United States Patent Office 2,732,547 Patented Jan. 24, 1956

2,732,547

SIREN

John F. Fletcher, Cleveland, Miss.

Application June 2, 1953, Serial No. 359,011

5 Claims. (Cl. 340—405)

This invention relates to a siren. In particular, it relates to a siren which can be operated to sound three different signals.

More specifically, this invention relates to an improvement in the siren disclosed in my patent, No. 2,471,028. In said patent, the shutter disclosed is for the purpose of opening and closing intermittently the sound outlet ports of the siren, a special centrifugally operated clutch mechanism being provided for this purpose. As such the siren would give only two sound signals, a rising sound as the siren motor is built up to normal speed, and a barking or yelping sound when the centrifugal clutch became automatically engaged. The objects of the present invention are to improve upon the mechanism for opening and closing the shutter so that three different sound signals may be produced, and to provide the operator with the optional use of the shutter at any time the siren is being operated, regardless of whether the siren motor is being powered or is coasting.

In general, these objects are obtained by using a solenoid, the armature of which constitutes a shaft which is rotatable by a train of gearing from the siren motor, and which shaft rotates a pin or cam. When the solenoid is energized, this rotating cam is brought into contact intermittently with a projection on the shutter, thus causing the shutter to oscillate and close intermittently the outlet ports of the siren upon each contact of the pin, or cam. Three different sound signals can be produced. With only the siren motor energized, the full sustained sound will occur; secondly if the motor switch is cut off intermittently, a rising and falling in pitch will be heard; and thirdly, with the solenoid energized, a whooping or interrupted sound will be made.

The means by which the objects of the invention are obtained are described more fully with reference to the accompanying drawings, in which:

Figure 1 is a side view of a siren with a portion cut away to expose the interior;

Figure 2 is an enlarged cross-sectional view of a detail in Figure 1;

Figure 3 is a cross-sectional view on the line 3—3, Figure 1;

Figure 4 is a cross-sectional view on the line 4—4, Figure 3;

Figure 5 is a cross-sectional view on the line 5—5, Figure 3;

Figure 6 is an enlarged cross-sectional view on the line 6—6, Figure 3; and

Figure 7 is an enlarged cross-sectional view of a detail in Figure 5.

The siren S in Figure 1 is constructed for the most part as is the siren shown in my patent, No. 2,471,028. Thus, the siren has the blower rotor 2 driven by the motor 4. Between the blower rotor 2 and the stator or outer casing 6 of the siren is mounted a shutter 8 as described in my aforesaid patent. This shutter is now adapted to be operated at will, either intermittently or continuously,

through a train of gears 10, said gears likewise being shown in said patent.

My improvement lies in mounting a solenoid 12 on the top of the housing of motor 4. The core of this solenoid is a shaft 14 both rotatable and longitudinally slidable in the solenoid. One end of shaft 14 is fitted with a pinion 16 which is slidably engaged with the teeth of elongated gear 18, this gear constituting the final gear in the train of gears 10. The other end of the shaft has a radially extending pin or cam 20 mounted thereon. A compression spring 22 which bears against the thickened portion 24 of shaft 14, and against a plate 26 secured to the motor housing, serves for the purpose of keeping shaft 14 normally held to the left as shown in dotted lines in Figure 4, this being in the non-engaged or deenergized position.

Shutter 8 is provided with studs 30 which extend through slots 32 in the wall 34 of the blower or stator chamber, these studs joining the shutter to a semi-circular yoke 36. An angle piece is attached to the yoke with a projecting flange 40 of this angle piece being in the path of pin 20 when the solenoid is energized.

A tension spring 42 extends from a bolt 30 to a point on wall 34 to hold the shutter normally in a position where the exhaust ports are open. A rubber bumper 42 is fastened to wall 34 and beneath that end of yoke 36 toward which the yoke moves when the shutter is moved by spring 42 to open position.

In operation, the spring 42 holds the shutter in open position so that when the siren motor rotates rotor 2, the siren will emit a continuous sound. As in conventional sirens, the pitch will rise as the siren motor increases speed until it reaches top speed. This sound is not interrupted until solenoid 12 is energized as by the vehicle driver pressing a button or the like to close a conventional electric circuit, at which time shaft 14 is displaced to the right, Figure 4, and as pinion 16 is still meshed with gear 18, pin 20 while being rotated is brought into the path of flange 40. Thus, the cam strikes the flange 40 on every revolution. As shown in Figure 3, the cam 20 rotates counterclockwise, and upon striking flange 40 displaces yoke 36 in a counterclockwise direction against the tension of spring 42. Cam 20 engages flange 40 until shaft 14 has rotated a sufficient distance to permit cam 20 to slide off the lower edge of flange 40. The right-hand side of the yoke is cushioned by bumper 42, which is struck as the cam disengages from flange 40, and the yoke is pulled into its normal open position by spring 42.

As yoke 36 is connected to the shutter 8, this shutter is turned to close the sound exhaust ports every time cam 20 strikes flange 40. When the solenoid is de-energized, shaft 14 will be moved to the left by spring 22 so that cam 20 no longer functions to actuate the shutter.

The advantages of this mechanism are in its simplicity and ruggedness. The opening and closing of the shutter is actuated at full motor speed from 80 to 100 revolutions per minute by gearing down motor 4 from normal speeds, which may vary from 3500 to 4500 R. P. M. through gear train 10. The intermittent barking sound given off by the siren by opening and closing shutter 8 distinguishes from the steady high frequnecy noises as set up in the running of a vehicle, such noises coming from the fan, the gears, the generator, etc. Consequently, a continuous siren noise which is oftentimes unnoticed by a motorist, a truck driver, or street car operator, and the like, is quickly made apparent by the barking effect given by the invention. The type of sound is much easier to locate directionally.

The siren of the invention has the further advantage of being able to emit different type signals, as for example for air raid warning purposes where "alert," raid "warning," and "all clear" signals are desired. These three

different signals can be given by the instant siren. In addition, the solenoid can be energized at will as the siren is accelerating or decelerating, and thus the barking or whooping noise can be imposed upon a sound having a rising and falling pitch. Consequently, the siren is much more versatile than that described in my aforesaid patent.

Having now described the means by which the objects of the invention are obtained, I claim:

1. In a siren having a motor, a housing with sound discharge ports, a rotor driven by said motor in said housing, a shutter for opening and closing intermittently said ports for giving an interrupted siren sound, and means for actuating said shutter, said means comprising a solenoid, the armature of which constitutes a rotatable and longitudinally movable shaft, a train of gears connecting said shaft to said motor, and means actuated by said shaft when displaced upon energizing said solenoid for intermittently closing said shutter.

2. In a siren as in claim 1, said actuating means further comprising a cam radially attached to said shaft, and means connected to said shutter for intermittent engagement with said cam.

3. In a siren as in claim 2, said means connected to said shutter further comprising a yoke bolted to said shutter, and a flange attached to said yoke and engageable by said cam.

4. In a siren as in claim 3, the structure further comprising a spring attached to said shutter for urging said shutter to open position.

5. In a siren as in claim 1, said actuating means further comprising an axially elongated gear forming the terminal gear in said train of gears, and a pinion mounted on said shaft and slidably engaged with the teeth of said elongated gear.

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