

M. ROELLIG.

SIREN.

APPLICATION FILED SEPT. 13, 1910.

1,036,722.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

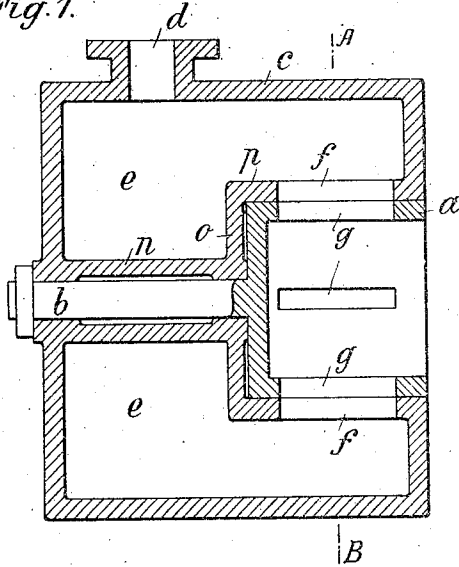


Fig. 2.

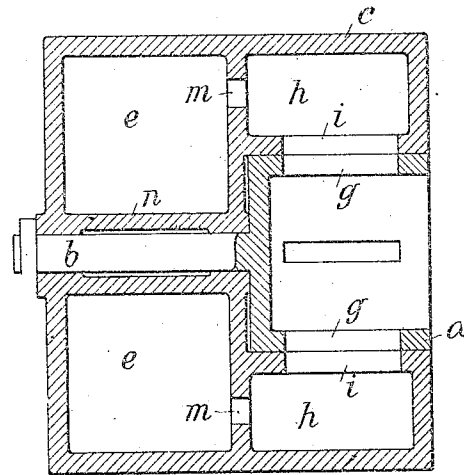
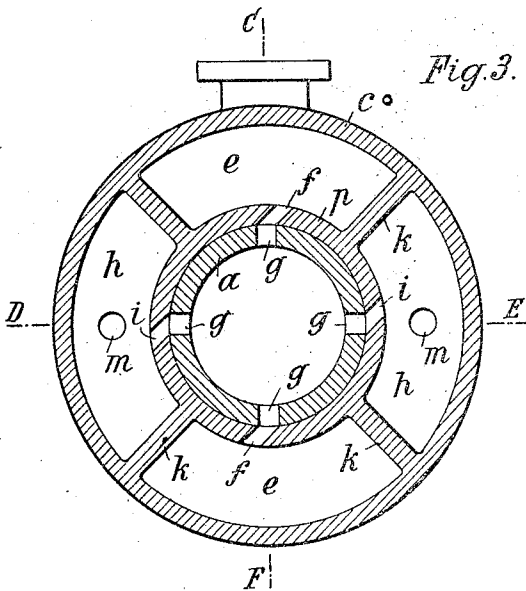


Fig. 3.



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2 SHEETS—SHEET 2.

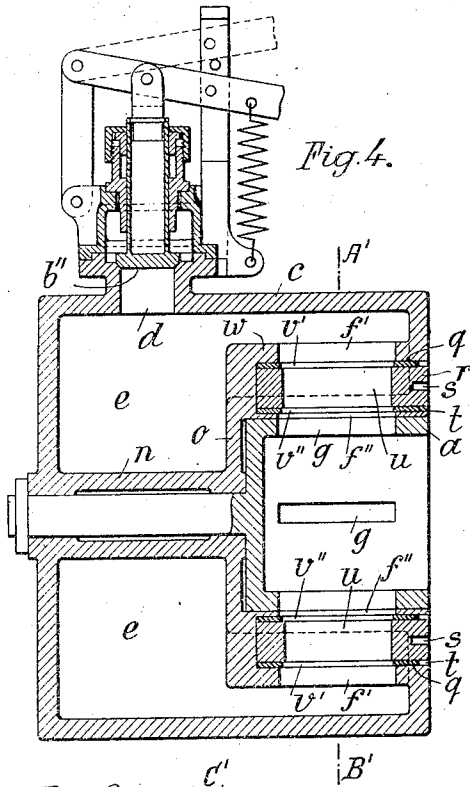


Fig. 4.

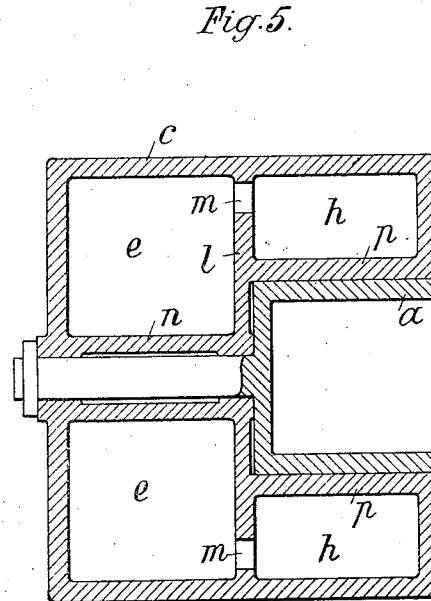


Fig. 5.

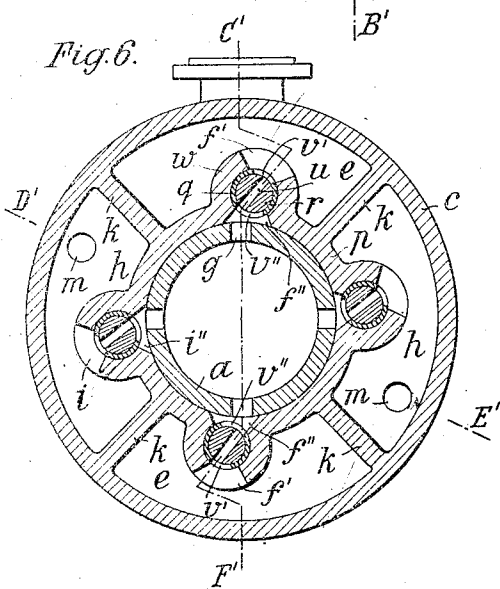


Fig. 6.

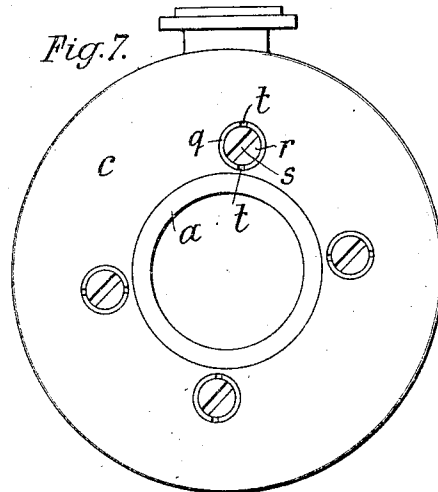


Fig. 7.

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UNITED STATES PATENT OFFICE.

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SIREN.

1,036,727.

Specification of Letters Patent.

Patented Aug. 27, 1912.

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To all whom it may concern:

Be it known that I, MARTIN ROELLIG, a citizen of the Empire of Germany, residing at Halensee, Berlin, in the Empire of Germany, have invented a new and useful Siren, of which the following is a specification:

The known simple sirens, comprising a casing and a rotary part provided on their peripheries with slots that extend radially in one of said parts and are inclined to the periphery in the other of said parts and which are adapted to serve as passages for a driving medium under pressure, present the defect that the speed of the rotary part does not remain constant but increases continuously, so that the tone produced is at first low but increases in proportion to the speed of the revolving part, until it becomes so very high as to be no longer of any use for many purposes.

My invention relates to improvements in such sirens, whereby not only the tone produced is prevented from exceeding a predetermined limit, but it also is possible to quickly alter the pitch, and consequently for example to give signals with one and the same siren, which signals are composed of tones of different pitches.

The chief improvement consists in employing oppositely inclined slots, either in the casing or in the rotary part, so as to enable the driving medium itself to prevent the speed of the rotary part from exceeding a predetermined limit.

Another improvement consists in a device of any suitable or known construction for varying at will, if preferred, the area or number of the slots in the casing or in the rotary part.

Where so preferred, a third improvement may be employed which consists in a device of any suitable construction for varying at will the angle of inclination of the inclined slots.

A fourth improvement, which may be employed in combination with the first improvement alone or together with any of the other improvements, consists in a device of any known construction for varying the pressure of the driving medium during its passage through the several slots, either uniformly or differently.

I will now proceed to describe my inven-

tion with reference to the accompanying 55 drawing, in which—

Figure 1 is a longitudinal section of one form of the invention on line C—F of Fig. 3; Fig. 2 is a longitudinal section on line D—E of Fig. 3; Fig. 3 is a cross section on line A—B of Fig. 1; Fig. 4 is a longitudinal section of another form or embodiment of my invention, said section being taken upon the line C'—F' of Fig. 3; Fig. 5 is a longitudinal section on line D'—E' of Fig. 6; Fig. 6 60 is a cross section on line A'—B' of Fig. 4; and, Fig. 7 is a front view of the form or embodiment of my invention shown in Fig. 4.

Similar letters of reference refer to similar parts in all the views.

Referring to Figs. 1 and 3 the siren illustrated consists of a cylindrical casing *c* and a rotary part *a*. The casing *c* is made integral with a tubular connection *d*, a central bearing *n*, an inner seat *o* and a concentric cylindrical wall *p*. The seat *o* and the wall *p* form a central chamber in which the rotary part *a*, viz. a hollow drum, fits. The drum *a* has a pivot *b*, which is mounted to turn in the bearing *n*, so that the drum *a* can rotate freely in the said chamber. The drum *a* has several, herein four, long slots *g g* placed radially and in the direction of its axis.

The casing *c* as described so far is similar to that of known sirens and may be supported in any known manner. In contradiction to the known sirens, however, the inclined slots *f i* of said casing *c* are not placed all in the same sense, but part thereof are inclined in one and part in the other direction. Thus two opposite, inclined slots *f f* are provided in the cylindrical wall *p*, both, placed or inclined in the same direction, while two other opposite, inclined slots *i i* are provided in the wall *p* and both placed or inclined in the opposite direction to the slots *f f*, as is clearly shown at Fig. 3. The area of the two slots *i i* is made smaller than that of the two slots *f f*. In Fig. 2 the drum *a* occupies such a position, that all of its slots *g g* register with the slots *f i f i* in the wall *p* of the casing *c*, although that is not absolutely necessary. It is evident, that since the slots *i i* are opposite to one another and also the slots *f f* are opposite to one another, the drum *a* will be bal-

anced, so that it can easily rotate. Preferably two special chambers *h h* are provided in the casing *e* opposite to one another, they being formed by radial partitions *h h* and bottoms *l l*. The two chambers *h h* communicate with the greater chamber *e* in the casing *e* through openings or slots *m* and belong to the two inclined slots *i i* of smaller area. The tubular connection *d* of the casing *e* is to be connected by means of a suitable tube or tube system with the source of driving medium under pressure, a stop valve *b''* (shown in Fig. 4) or the like being preferably inserted between the connection *d* and the tube or tube system or at any other suitable location.

When the stop valve *b''* or the like is opened, the driving medium under pressure will enter the chamber *e* through the tubular connection *d*, pass through the slots *f f* of the casing and the slots *g g* of the drum *a* and escape from the cavity of the latter. As the jets of medium under pressure strike the opposite walls of the radial slots *g g*, the drum *a* is thereby driven in one direction, viz. contra-clockwise in Fig. 3, at first slowly, but afterward at an increasing speed. As, however, the medium under pressure also enters the two small chambers *h h* through the openings *m* and passes periodically through the oppositely inclined slots *i i* of the casing and through the radial slots *g g* of the drum, the consequence will be that the drum *a* is also subjected to forces tending to drive it in the opposite direction, with the result, that it is driven by the difference of the oppositely directed forces and at a speed, which is practically nearly constant. This is explained by the fact that the pressure of the fluid flowing through the slots *f f* against the opposite walls of the radial slots *g g* will gradually diminish in proportion as the said walls more rapidly recede, and in case of the slots *i i* that the pressure of the fluid will gradually increase as the opposing walls of the radial slots more rapidly approach. As is well known, the pitch of the tone produced by the intermitting jets of medium escaping from the cavity of the drum depends upon the speed of the drum *a* and upon the pressure of the medium. It is evident, that by regulating the pressure of the medium by more or less opening the said stop valve *b''* or the like it is easy to alter at will the pitch of the tone and thus to give signals of any kind. It is also obvious, that by proportioning the areas of the oppositely inclined slots in proportion to one another the siren can be adjusted for any pitch of the sound. For example, instead of providing the inclined slots *f f* in the wall *p* slots *f' f''* may be provided opposite each other in the walls of hollow cylinders *w*, as shown in the modified construction illustrated in Figs. 4 to 7. In each

hollow cylinder *w* there is provided in this modification a sleeve *q* having slots *e' e''* and a plug *r* provided with a slot *u*. The sleeves *q* and the plugs *r* can each be turned separately by inserting any suitable instrument into the slots *t t* and *s* provided in the outer ends of said sleeves and plugs respectively (see Figs. 4 and 7). By turning the sleeves *q* it will therefore be apparent that said sleeves may be so adjusted as to vary or determine as desired the size or the number of the slots *f' f''*. It will also be apparent furthermore that by turning the plugs *r* relatively to the sleeves *q* the inclination of all or any number of the slots *u* may be varied or adjusted as desired. It will be self-evident that by simultaneous relative adjustment of the sleeves *q* and the plugs *r* the size, number and inclination of the slots *u* can be simultaneously varied. In the same manner, instead of providing the inclined slots *i i'* in the wall *p*, as shown in Fig. 3, slots *i' i''* may be provided opposite each other in hollow cylinders *u'*, and in said hollow cylinders may be provided rotatable sleeves *q'* provided with opposed slots *v' v''*, and within said rotatable sleeves rotatable plugs *r'* having slots *u'*, said cylinders *u'*, sleeves *q'* with their slots *v' v''* and said plugs *r'* with their slots *u'* being in all respects similar to the cylinders *w*, sleeves *q*, slots *v' v''* and plugs *r* with their slots *u* above described. It will thus be seen that the same adjustment or variations can be effected in respect to the slots *i' i''* as above described in respect to the slots *f' f''*. The number of slots *f* and *i* may be increased and the slots may be disposed in groups and devices of any known construction may be provided for closing and opening at will any or all of the groups of slots for varying the tone or giving signals of any kind.

The siren described can be varied in many respects without departing from the spirit of my invention.

I claim:

1. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots, of a rotary part having slots adapted to periodically register with the slots in the inner circular wall of said casing, the slots of one part being at right angles to the periphery and the slots of the other part being inclined to the periphery some in one direction and some in the other direction, the slots inclined in one direction having a larger area than the slots inclined in the other direction.

2. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots and divided by partitions into chambers communicating with one another by openings, of a rotary part having slots adapted to

periodically register with the slots in the inner circular wall of said casing, the slots of one part being at right angles to the periphery and the slots of the other part being inclined to the periphery some in one direction and some in the other direction, the slots inclined in one direction having a larger area than the slots inclined in the other direction.

10 3. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots of a rotary part having slots adapted to periodically register with the slots in the
15 inner circular wall of said casing, the slots of one part being at right angles to the periphery and the slots of the other part being inclined to the periphery some in one direction and some in the other direction, the
20 slots inclined in one direction having a larger area than the slots inclined in the other direction, and means for closing and opening at will one part of the slots in the inner circular wall of said casing.

inner circular wall of said casing.

25 4. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots and divided by partitions into chambers communicating with one another by open-

30 ings, of a rotary part having slots adapted to periodically register with the slots in the inner circular wall of said casing, the slots of one part being at right angles to the periphery and the slots of the other part being

35 inclined to the periphery partly in one direction and some in the other direction, the slots inclined in one direction having a larger area than the slots inclined in the other direction, and means for closing and

40 opening at will one part of the slots in the inner circular wall of said casing.

5. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register with the slots in the inner circular wall of said casing.

6. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction and divided by partitions into chambers communicating with one another by openings, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register with the slots in the inner circular wall of said casing.

7. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register with the slots in the inner circular wall of said casing, and means for closing and opening at will one part of the slots in the inner circular wall of said casing.

8. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction and divided by partitions into chambers communicating with one another by openings, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register with the slots in the inner circular wall of said casing, and means for closing and opening at will one part of the slots in the inner circular wall of said casing.

9. In a siren of the class described, the combination of a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register with the slots in the inner circular wall of said casing, and means for varying the angle of inclination of some or all of the slots in the inner circular wall of said casing.

10. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction and divided by partitions into chambers communicating with one another by openings, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register with the slots in the inner circular wall of said casing, and means for varying the angle of inclination of some or all of the slots in the inner circular wall of said casing.

11. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register

with the slots in the inner circular wall of said casing, means for varying the angle of inclination of some or all of the slots in the inner circular wall of said casing, and for closing and opening at will one part of the slots in the inner circular wall of said casing.

12. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots inclined to the periphery some in one direction and some in the other direction and divided by partitions into chambers communicating with one another by openings, the slots inclined in one direction having a larger area than the slots inclined in the other direction, of a rotary drum having radial slots adapted to periodically register with the slots in the inner circular wall of said casing, means for varying the angle of

inclination of some or all of the slots in the inner circular wall of said casing, and for closing and opening at will one part of the slots in the inner circular wall of said casing.

13. In a siren of the class described, the combination with a casing having an outer wall and an inner circular wall with slots, of a rotary part having slots adapted periodically to register with the slots in the inner circular wall of said casing, the slots of one of said parts being directed perpendicularly to the periphery and the slots in the other of said parts being inclined to the periphery in opposite directions and of different areas.

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Witnesses:

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