2 Sheets—Sheet 1

J. W. FOWLE.

Ships' Fog-Signals.

No. 220,231. Patented Oct. 7, 1879.

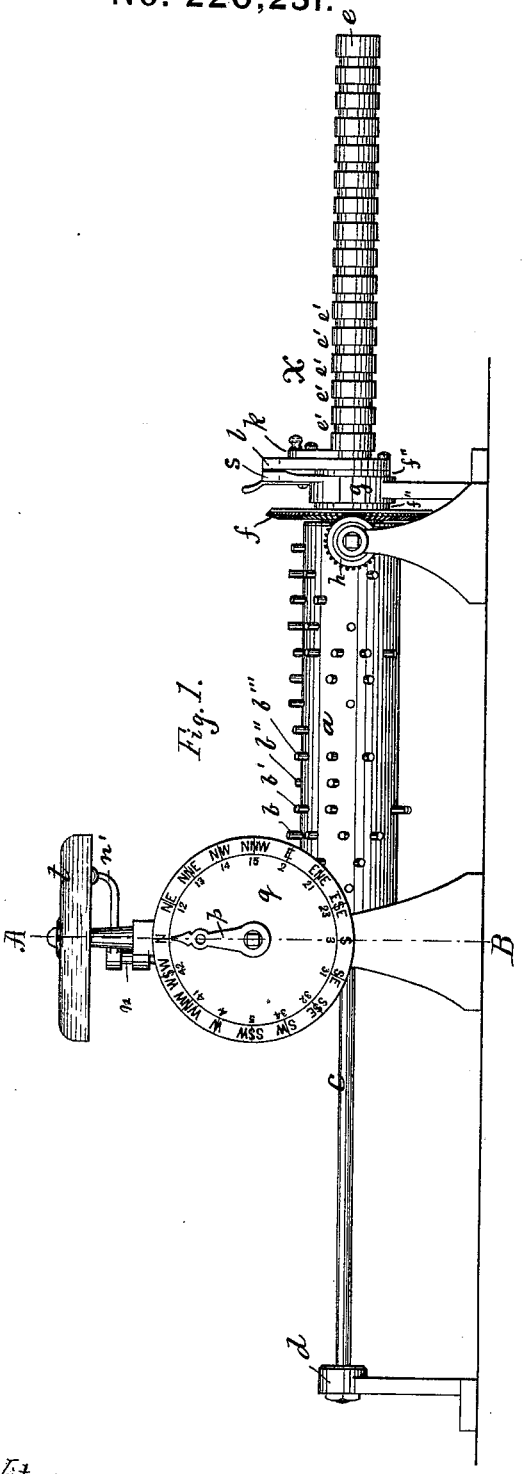

Fig. 1.

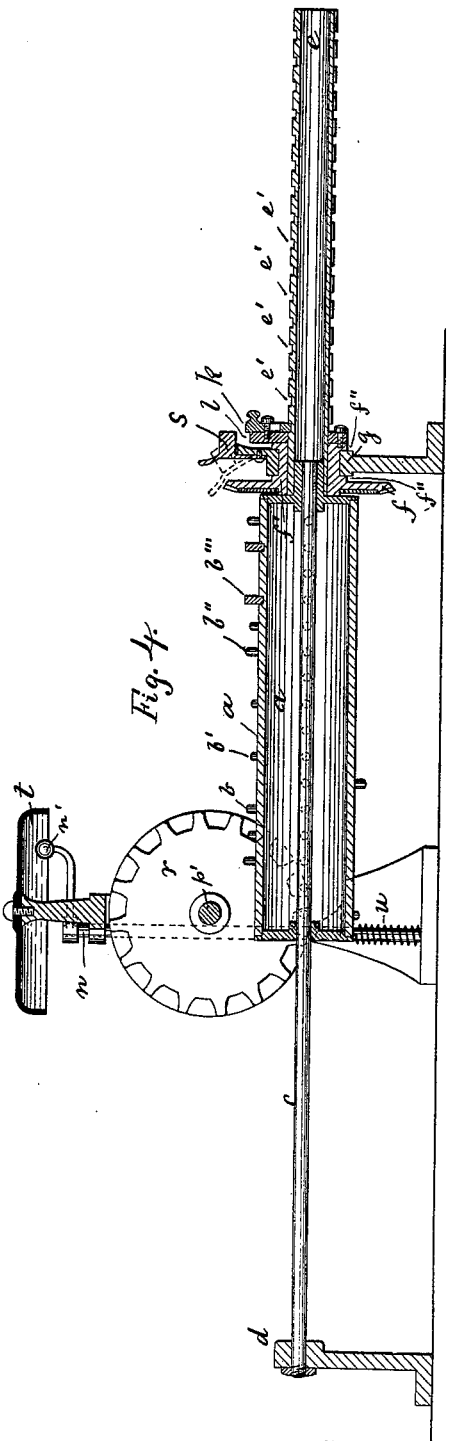

Fig. 4.

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Fig. 5.

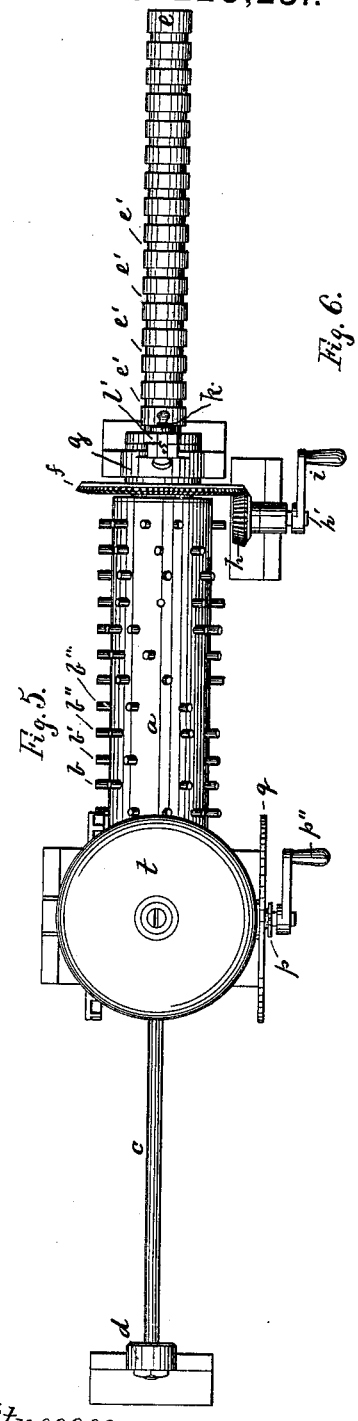


Fig. 6.

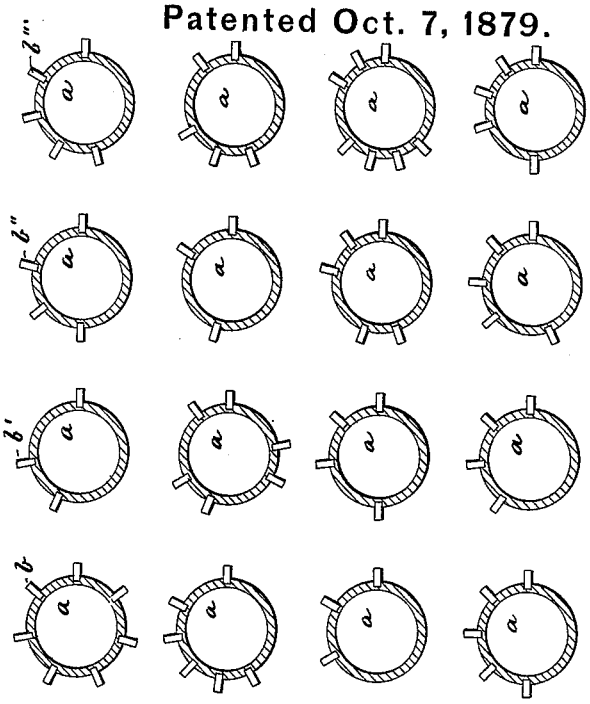


Fig. 2.

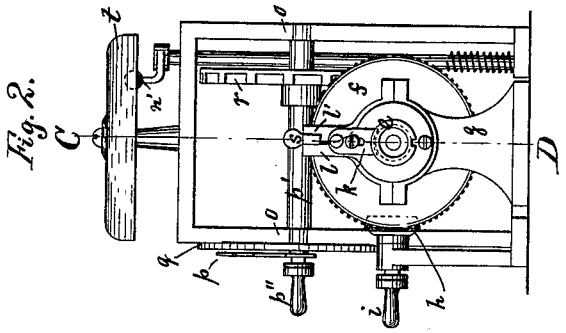
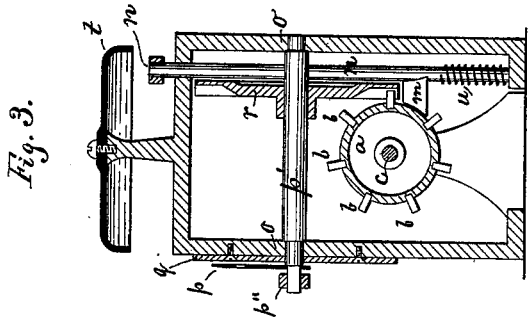


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH W. FOWLE, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SHIPS' FOG-SIGNALS.

Specification forming part of Letters Patent No. **220,231**, dated October 7, 1879; application filed April 9, 1879.

To all whom it may concern:

Be it known that I, JOSEPH W. FOWLE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Ships' Fog-Signals and Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ships' fog-signals and fog-signal apparatus; and consists in indicating, by means of a sounding-instrument, the course in which the ship is sailing or propelled—as, for instance, a single tone, repeated at constant intervals, would indicate to other vessels that the vessel signaling was going due north; one note, a pause, and two notes would indicate north-east; one note, a pause, and three notes would indicate north north-east, and so on. The exact arrangement of tones and pauses for each point of the compass is, of course, arbitrary; but, once established by law or treaty or otherwise between maritime nations, they should remain unchangeable and standard. By such a code of signals vessels passing by each other in foggy weather would know by the sound in what direction or locality each one was, as usual; but, in addition to this, by the use of this code of fog-signals, each vessel would know exactly in what direction the other was sailing or propelled, and by this means avoid collisions or accidents.

The apparatus I employ for this purpose is constructed as follows: It consists of a cylinder provided with pins or projections on its periphery, which projections are arranged in parallel circles on the said cylinder, and said projections act upon a tooth or incline on a shaft, to which is secured the hammer of a gong or bell or suitable sounding-instrument, and in this manner the gong or bell is struck during the rotation of the toothed cylinder. The respective rows of teeth on the said cylinder are so arranged that the first row, for instance, has all its teeth located equidistant from each other, so as to act upon the hammer-shaft to produce a repeated single sound of the gong or bell.

The next row of teeth may so be arranged as to operate the hammer shaft to produce one blow, a pause, and two final blows, representing the number 12, and so on.

Said cylinder is set in rotary motion by means of bevel-gears, or equivalent devices, operated by hand or weight or other power. The said toothed cylinder is longitudinally adjustable in stationary bearings, so that either of the rows of teeth on it may be located in such a position as to engage with the projection on the bell-hammer shaft. The said cylinder is moved longitudinally by means of a toothed disk or wheel secured to a shaft that is movable in stationary bearings, and to the forward end of said shaft is secured an index finger or pointer, that swings in front of a stationary and graduated index-plate having compass-point marks, as well as numerals indicating the number of strokes to be sounded for the respective points of the compass, according to the course in which the vessel is going. Thus, for instance, if the vessel sails due north, the index is moved to the place marked N on the index-plate, and the cylinder is moved longitudinally to a corresponding position, and when rotated the gong or bell will be sounded repeatedly, according to the number directly below the mark N, thus 1, 1, 1.

If the course of the vessel is changed to north-east, for instance, the operator moves the index to the place marked N E on the index-plate, when the toothed cylinder is laterally moved to a corresponding position, and when rotated in such position the gong or bell will be sounded repeatedly, according to the numbers directly below the marks N E, thus 1 2, 1 2.

I prefer to provide one end of said rotary cylinder with an extension provided with parallel circular grooves on its periphery, into which a movable locking-plate is arranged to rest, according to the position in which the cylinder is moved longitudinally, so as to prevent the said cylinder from moving longitudinally as

long as the course of the vessel remains the same, and until it is released by the operator. I also employ a simple stop mechanism, so as to always stop the rotation of the cylinder in one and the same position previous to changing the longitudinal position, so as to allow the toothed wheel on the index-shaft to engage with the first longitudinal row of teeth on the cylinder, as will hereinafter be more fully shown and described.

On the accompanying drawings, Figure 1 represents a front elevation of my improved fog-signal apparatus. Fig. 2 represents an end view, seen from *x* in Fig. 1. Fig. 3 represents a cross-section on the line A B shown in Fig. 1. Fig. 4 represents a central longitudinal section on the line C D shown in Fig. 2. Fig. 5 represents a plan view, and Fig. 6 represents the arrangement of teeth on the rotary cylinder for corresponding points of the compass.

a is the rotary cylinder, with its teeth *b b' b'' b'''* located in circular rows thereon. *c* is the shaft, around which the cylinder is made to rotate as well as to move in a longitudinal direction. *d* is the bearing for the shaft *c*, as shown. *e* is the extended hollow end of the cylinder *a*, which hollow end has its bearing within the hollow hub *f'* of the bevel-gear *f*.

The hub *f'* of said gear is supported in the bearing *g*, as shown, it being, for the purpose of preventing a lateral motion of the said gear, provided with annular flanges *f'' f'''*, as shown.

h is the small bevel-pinion gearing into the gear *f*, by means of which a rotary motion is imparted to the cylinder *a* by manipulating a crank, *i*, on the pinion-shaft *h'*, or by applying a clock mechanism or other automatic motor to the said shaft *h'*.

e' e' e' are annular grooves on the hollow extension *e*, which grooves serve as a locking device in combination with the movable locking-plate *k*, that is adjustable on the arm *l*, the latter being secured to the hollow hub *f'* of the gear *f*, as shown.

By moving the adjustable locking-plate *k* outward on its arm *l* the lower end of said locking-plate is disengaged from the groove *e'*, in which it was retained, and the cylinder *a* may now be moved in the direction of its axis until any desired row of its teeth come into operative position with the tooth or incline *m* on the oscillating hammer-shaft *n*, for the purpose of sounding the signal for any desired course of the vessel.

When the cylinder is properly adjusted, as above named, the locking-plate *k* is moved toward the extension *e* until the inner end of said locking-plate rests in the corresponding groove *e'* thereon, when the cylinder *a* may be continuously rotated without liability of working laterally.

o o are the bearings for the index-shaft *p'*, to which the index or pointer *p* is secured. *p''* is a crank on the forward end of the shaft *p'*, by means of which the latter is rotated for the purpose of moving the pointer *p* to any desired position in front of the stationary index-plate *q*, that is provided with compass-point marks, as shown, below which the number of strokes of the gong corresponding to the course of the vessel are arranged in concentric circles, as shown, and also for the purpose of adjusting the cylinder *a* longitudinally to a corresponding position, so that its teeth shall act upon the hammer-tooth *m* to strike the gong or bell such number of strokes as are indicated on that part of the index-plate to which the index is set.

For the purpose of moving the cylinder *a* longitudinally in its bearings, I secure a gear-wheel, *r*, to the index-shaft *p'*, the teeth of which are made to engage with the first longitudinal row, or starting-row, of teeth on the cylinder *a*. For this purpose it is necessary, previous to moving the said cylinder in a longitudinal direction, to hold it temporarily in its starting-point position, which is shown in Fig. 5; and to accomplish this I provide the rotary arm *l* with a slot or recess, *l'*, in its upper end, as shown in Figs. 2 and 5, into which the movable block or projection *s* is inserted when the cylinder *a* is to be locked so as not to turn on its axis.

The movable block or locking-piece *s* is jointed to, or otherwise made adjustable on, the upper part of the stationary bearing *g*, as shown in Figs. 1 and 4.

When not locked into the recess *l'* the said locking-piece *s* is withdrawn, as shown in dotted lines in Fig. 4, and is held back by means of a spring or other similar device; and I wish to state that I do not confine myself to any exact locking device for this purpose, as it may be changed without departing essentially from my invention.

n' is the hammer on the hammer-shaft *n*, and *t* is the sounding bell or gong, against which the hammer is made to strike during the rotation of the cylinder *a*, the teeth of which act upon the tooth or incline *m* on the said hammer-shaft.

As each tooth in the row on the rotary cylinder *a* passes by the incline *m* the spring *u* on the hammer-shaft *n* is wound up, as usual in the ordinary gongs, and the hammer is made to strike the gong by the action of the spring as soon as a tooth on the cylinder *a* has passed by the incline *m* on the hammer-shaft.

I also wish to state that I do not confine myself to the exact arrangement of the hammer-bar, spring, hammer, and bell as shown in the drawings, as these parts may be varied without departing from the spirit of my invention.

What I wish to secure by Letters Patent, and claim, is—

1. The herein-described ship's fog-signal apparatus, consisting of the rotary and laterally-adjustable cylinder *a*, with its annular rows of teeth *b' b'' b'''*, the movable index *p*,

index-shaft p', stationary index-plate q, wheel r, and sounding mechanism $m\ n\ u\ t$, as and for the purpose set forth.

2. In combination with the laterally-adjustable and rotary toothed cylinder a, the extension e, with its annular grooves $e'\ e'\ e'$, the bevel-gears $f\ h$, rotary arm $l\ l'$, movable locking-plate k, and locking device s, as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I have affixed my signature in presence of two witnesses.

JOSEPH W. FOWLE.

Witnesses:
ALBAN ANDRÉN,
CHARLOTTE E. THOMPSON.