2 Sheets, Sheet 1.

A. W. Hart,

Aquatic Toy.

No. 109,992. Patented Dec. 6. 1870.

Fig 1

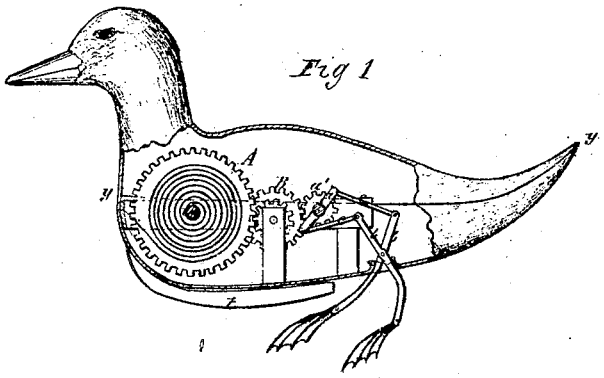

Fig 2

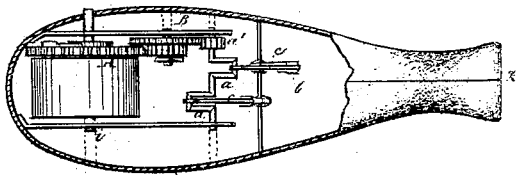

Fig 3.

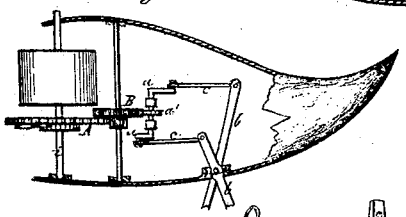

Fig 7

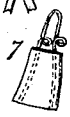

Fig 8

Fig 9

Fig 5

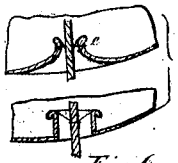

Fig 4

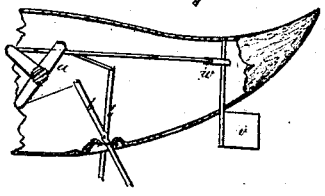

Fig 6

Witnesses.

H. J. Steele

F. W. Robertson

Inventor.

A. W. Hart

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2. Sheets Sheet 2.

Aquatic Toy

No. 109,992. Patented Dec. 6. 1870.

Fig 10

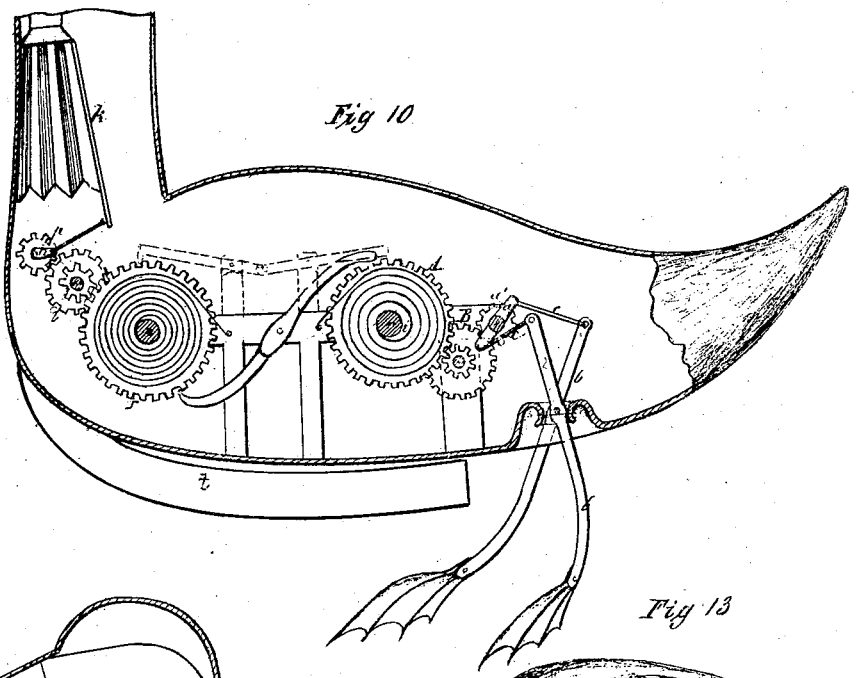
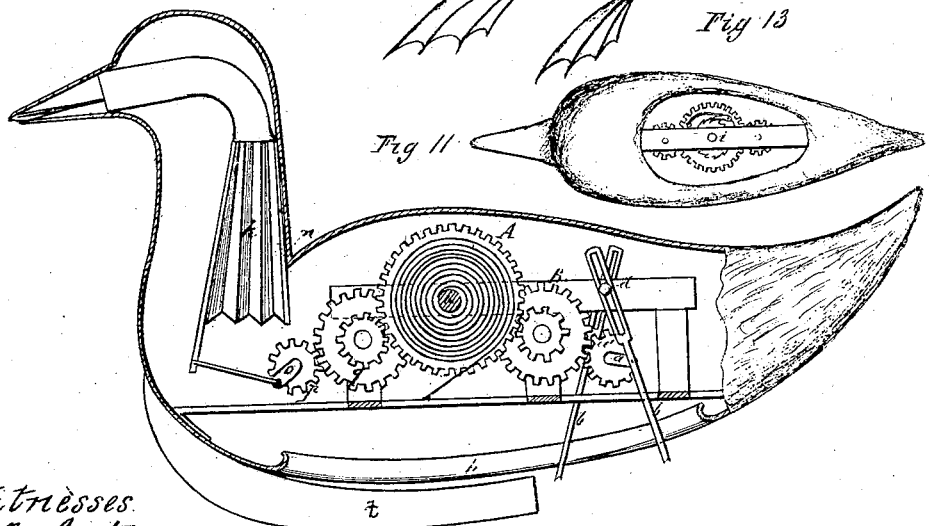


Fig 13

Fig 11

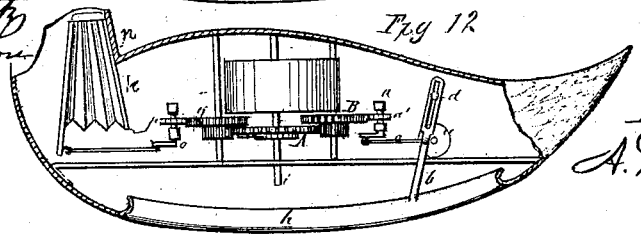


Witnesses.

H. J. Hartz

J. W. Robertson

Fig 12



Inventor.

A. W. Hart

United States Patent Office.

AMOS W. HART, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO HIMSELF AND WILLIAM M. TILESTON, OF SAME PLACE.

Letters Patent No. 109,992, dated December 6, 1870.

IMPROVEMENT IN AQUATIC TOYS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, AMOS W. HART, of the city and county of Washington, in the District of Columbia, have invented a new and improved Aquatic Toy; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, Sheets I and II, in which—

Figure 1 represents a side view of a toy duck, with part broken away to show the propelling mechanism;

Figure 2 is a plan view; and

Figure 3, a sectional elevation of the same, showing the arrangement of mechanism when the winding-post is vertical.

Figure 4 shows a grinding or steering mechanism.

Figures 5 and 6 exhibit the means of keeping out the water where the legs pass through the shell.

Figures 7, 8, and 9 show forms of feet to be pivoted to the legs.

Figure 10 is a sectional elevation of a propelling and quacking mechanism combined.

Figure 11 represents the quacking and propelling mechanism arranged to be operated by the same motor or spring; also, the shell or body of the toy cut out on the under side.

Figure 12 is a sectional elevation of the same, arranged with the winding-post vertical; and

Figure 13 is a plan view of the under side of the toy, with the shell cut out, as in figs. 11 and 12.

The object of my invention is to furnish the public, more especially the juvenile portion thereof, with a novel toy, in the form of an aquatic bird, which shall be adapted to propel itself automatically through the water in a wholly natural manner, and at a more or less rapid rate, and in a straight course or in circles of greater or lesser diameter. The toy is also adapted to emit a series of sounds resembling the quack or other peculiar cry of the natural or living bird.

The invention consists in a shell or hollow body, of any suitable material, in form of a duck or some other aquatic bird, provided with a propelling mechanism for imparting the alternate vibratory movement to the legs and feet necessary to cause them to similate, as near as practicable, the motion of the corresponding parts of the living animal, and in combining with the propelling apparatus a mechanism for producing the quacks or other sounds, the operative devices being constructed and arranged substantially as hereinafter described.

The arrangement of gearing is such that the sounds may be produced during the whole or a part only of the time in which the propelling mechanism is in operation, or previous or subsequent thereto, as desired.

The invention also consists in certain other features—mainly details of construction and arrangement of parts—as hereinafter fully described.

I construct the shell or body of the toy of any suitable material, preferably, however, of sheet metal, which may be readily struck up into the proper form.

I provide a train of wheels, A B, for rotating the crank-shaft, operated by spring power, through the medium of a pinion, which is fast thereon.

The shaft *a*, in figs. 1, 2, 3, 4, and 10, is shown connected with the upper ends of the legs *b b* by rods *c c*.

The legs are shown in said figures as pivoted a short distance apart, at or near the point of insertion through the holes in the bottom of the toy.

Thus arranged, the legs have a vibratory movement, and necessarily require the feet to be hinged or pivoted.

In figs. 11 and 12, the legs *c c* are shown slotted at their upper ends, to work on studs *d d*, and connected directly with the crank-shaft *a;* or, when the winding-post is vertical, as in fig. 12, the connection between the crank-shaft and legs is made also by the rods *c c*.

Thus arranged, the legs have, when operated, a combined circular and vibratory movement.

I construct the feet of sheet metal or any other suitable material, and give them any preferred form to adapt them to their office. They may be corrugated, with a scalloped edge, as in figs. 1 and 10; plain, as in fig. 9; of shovel form, as in fig. 8; or made of wire, looped, and bent into proper form, and having thin sheet metal or other material to constitute the web, as in fig. 8. In each case they have a shank extending above the pivotal point

To exclude the water, and still allow the legs free movement, I form or attach an upward or downward-projecting flange, *e*, on the shell around the holes through which the legs *b b* pass, and, by a wire or cord, confine one end of a rubber tube tightly around the flange *e*, and its other end around the leg.

When the winding-post *i* is horizontal, as in figs. 1, 2, 10, and 11, the winding-key will be applied through an orifice in the side of the toy. The post may, in that case, be provided with a stuffing-box or an equivalent device, to exclude the air when necessary.

When the winding-post *i* is vertical, as in figs. 3, 11, 12, and 13, the key is applied at the lower end.

These respective positions of the winding-post necessitate corresponding changes in the arrangement of gears and crank-shaft, or shafts from the vertical to the horizontal plane, and *vice versa*.

The details of arrangement in each case are fully illustrated in the drawing.

I have shown, in figs. 11, 12, and 13, the bottom of the toy cut out to form an opening sufficiently large to allow access to the post *i*, and also to permit the free movement of the legs *b b*. In such case the shell

of the toy is made air-tight in its whole upper portion, and the air confined in the cavity forms the support when the toy is placed in the water.

A flange, *h*, may be formed around the opening, of a height sufficient to prevent the water rising above it.

To produce the quacks or other sounds imitative of the notes of the living bird, I arrange a compressible air-reservoir, *k*, in any convenient position in the front part of the cavity or chamber of the toy, and connect therewith a tube, *l*, open at each end, which communicates with the external atmosphere at any convenient point, preferably in the bill *m*.

The upper end of this tube is provided with a reed, which is secured in or to the end of the tube, and is free at its outer end, so that when air is forced out through the tube the reed will be vibrated.

It may be necessary to give a flare or funnel shape to the reed end of the tube, and also to slit the same a short distance on each side of the reed.

If the toy be made to represent any other form of aquatic bird, a suitable device may be substituted for the reed to produce the required sounds.

When the bottom of the toy is cut out, the air-reservoir or bellows may be arranged in contact with the shell, as in figs. 11 and 12, so that air may enter the same through a valved aperture, *n*.

I have arranged the bellows *k* to be operated by a rod from a crank-shaft, *o*, which has a fast pinion, *p*, meshing with an intermediate spur-gear, *q*.

The quacking attachment may be operated by placing this gear in direct communication with the propelling train of wheels A B, as in figs. 11 and 12, so that the toy shall both propel itself and quack during the time the power of the spring is sufficient; or the gear *q* may be arranged to mesh with a larger spur-gear, *r*, as in fig. 10, which has a spring-and-ratchet attachment similar to the propelling apparatus A B.

The two trains may be allowed to operate separately; but I prefer the gear *r*, so as to lock the same by engaging with its teeth, and extend the other arm of the same into such proximity with the spring of the train A B that, when said spring has expanded to a certain extent, the lever will be disengaged by the upward pressure of the spring and the quacking mechanism released.

An equivalent arrangement of a double or jointed lever is shown in dotted lines, fig. 10.

I esteem the vertical metal plate *t*, figs. 1, 10, and 11, the best and simplest device for steering the toy. This plate is formed, preferably, of sheet metal, and is secured, by solder or other means, to the front part of the under side of the toy, and extends backward. The free end thus formed may be bent or curved laterally, to cause the toy to describe circles—the more acute being the angle or curve, the smaller the circle, and *vice versa*.

When the legs are made of wood in place of wire or sheet metal, the feet may be hinged to a tapered shank, *u*, as in fig. 9, which is held by friction in a socket of corresponding form in the end of a leg, *b*. This construction permits the foot to be set at any desired angle to the body of the toy, and thus the same will be propelled, accordingly, in a circle or a straight line.

In fig. 4 I have shown a sort of oscillating rudder, *v*, whose arm *w* is connected with the crank-shaft *a* by a rod, *x*. The arrangement is such that the rudder will be turned at each revolution of the shaft *a* toward the leg, which is making the backward or propelling stroke, thus preventing such stroke throwing the toy out of the direct or other line it is desired it should take.

For convenience in placing or securing the propelling or quacking mechanism in the shell, the latter may be struck up or made in three parts, the lower part or half being in one and the upper in two pieces, as indicated by the respective lines *y z*, in figs. 1 and 2.

I do not restrict myself to the precise arrangement of means shown for operating the legs or the quacking attachment, as the trains of wheels may be arranged in many other ways and yet similar results be obtained. Nor do I restrict myself to the precise means shown for disengaging the quacking apparatus, since the ordinary skill of the mechanic is sufficient to devise other analogous ones.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a toy representing an aquatic bird, of a steering or guiding-plate, *t*, attached thereto at its front end, substantially as shown and described.

2. The combination, in a toy representing an aquatic bird, of the legs *b b*, crank-shaft *a*, and train of wheels A B, substantially as shown and described, and for the purpose specified.

3. The combination, in a toy representing an aquatic bird, of the legs *b b* and train of wheels A B with the train *q p*, crank-shaft *o*, and compressible air-reservoir *k*, substantially as and for the purpose specified.

4. The combination, in a toy representing an aquatic bird, of a rubber tube, or other membrane impervious to water, with the flange *c* and leg *b*, substantially as and for the purpose specified.

AMOS W. HART.

Witnesses:
T. J. W. ROBERTSON,
THOS. D. D. OURAND.