

W. A. STEWART.  
Fog-Signals.

No. 145,915.

Patented Dec. 23, 1873.

Fig. 1.

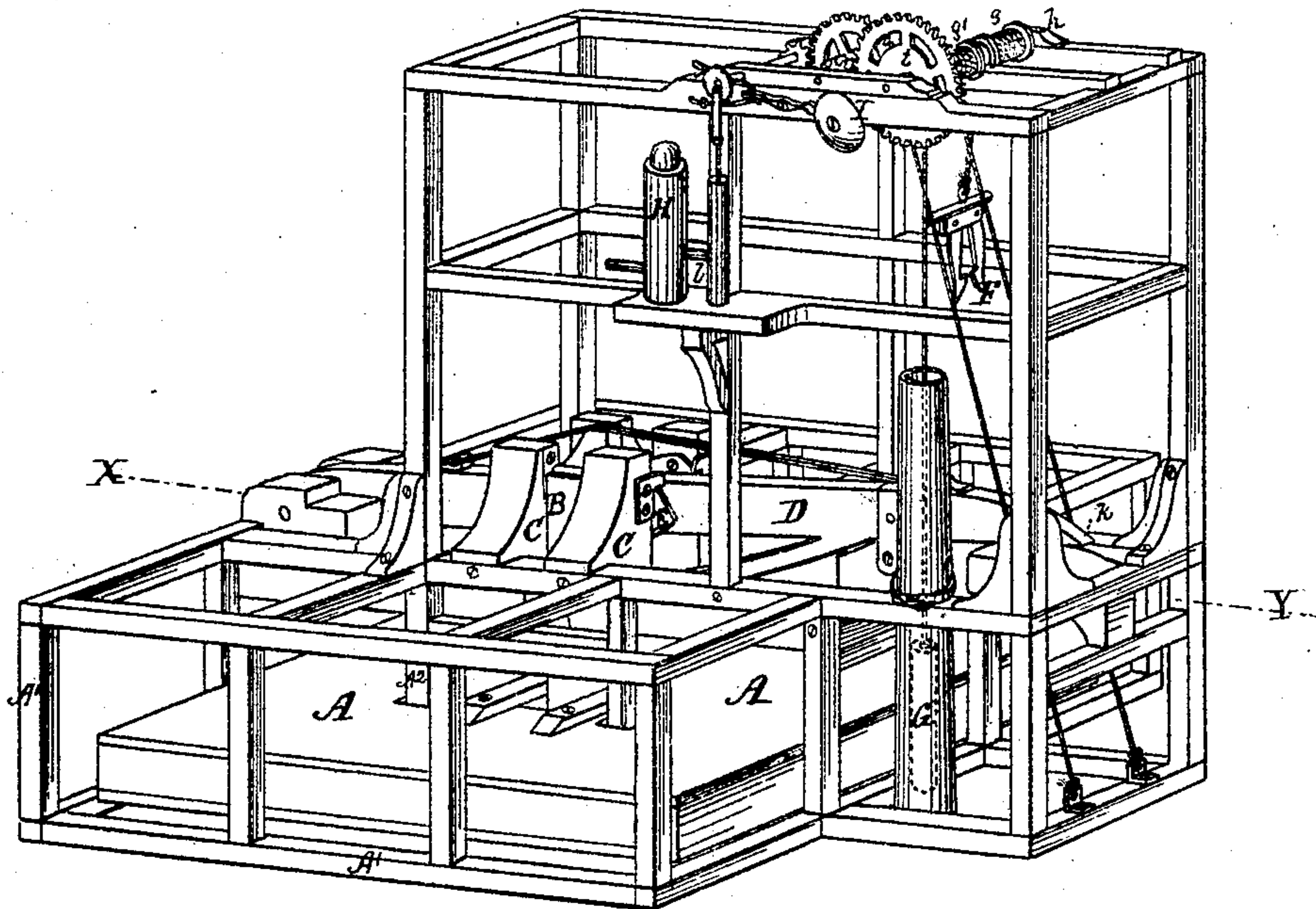


Fig. 2.

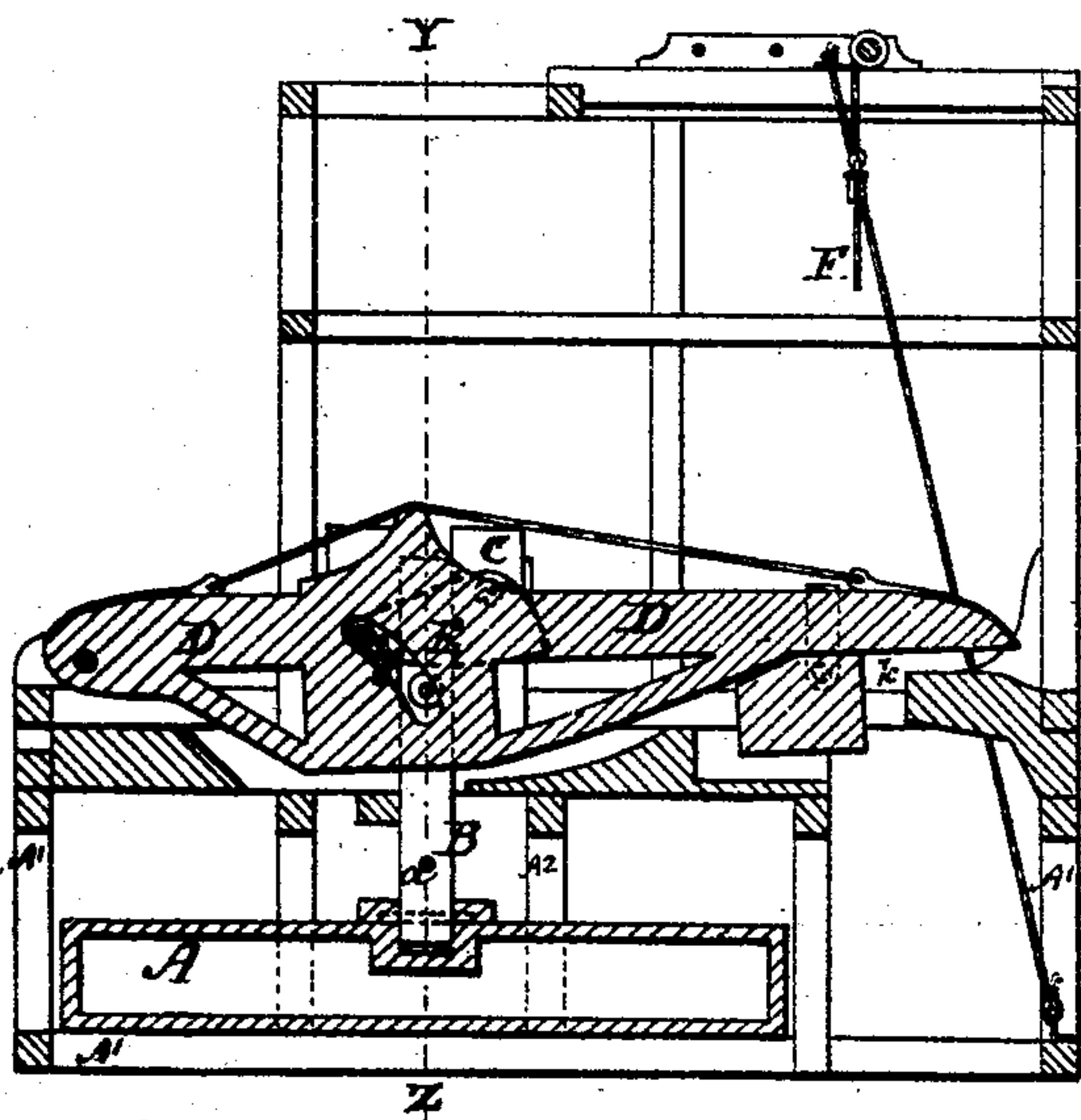


Fig. 3.

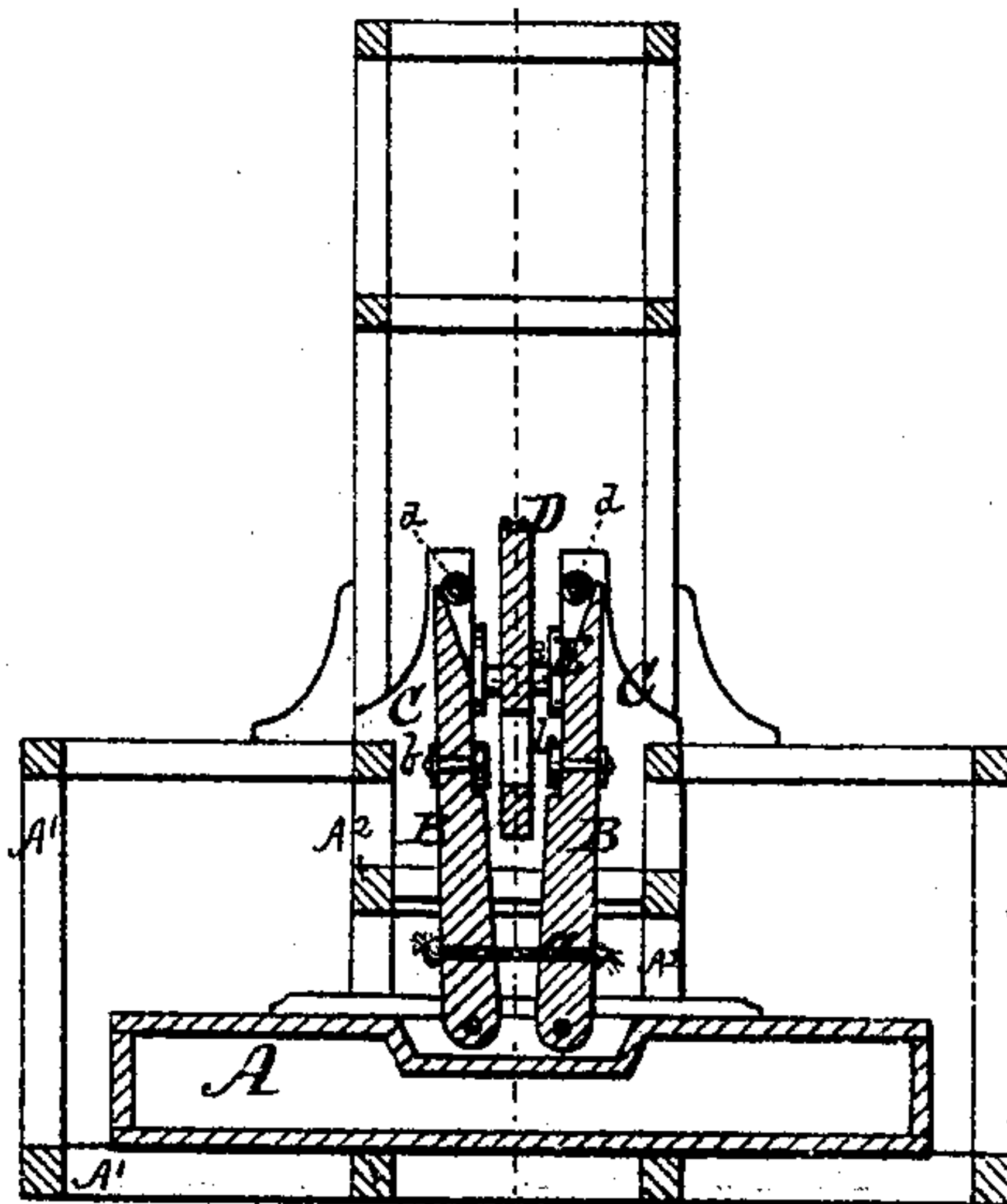
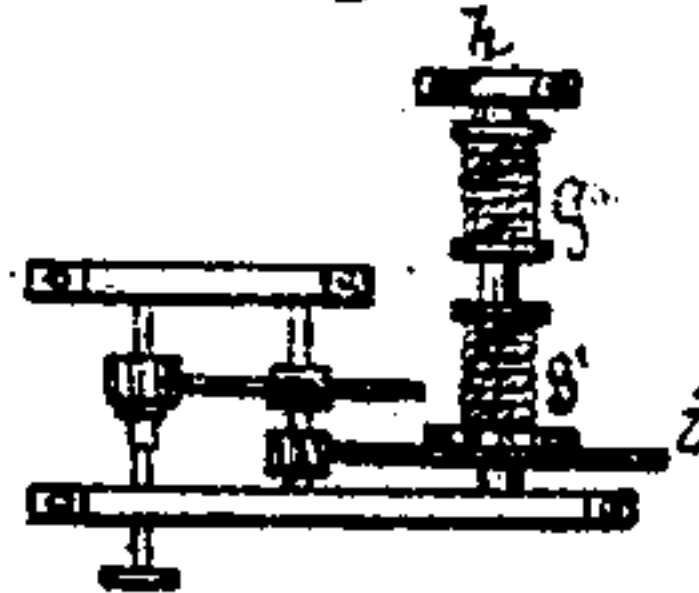


Fig. 4.



Witnesses.  
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Fig. 5.

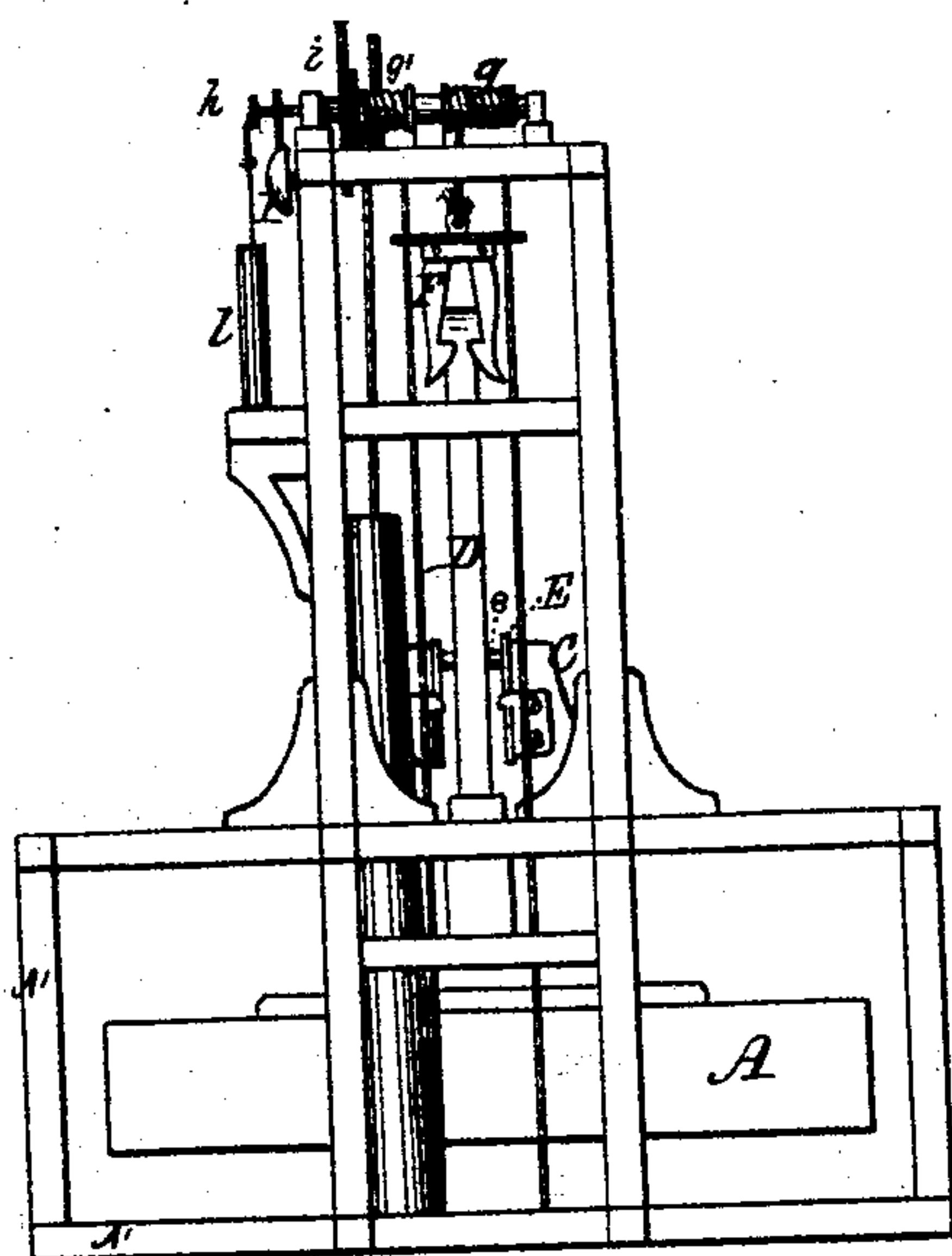
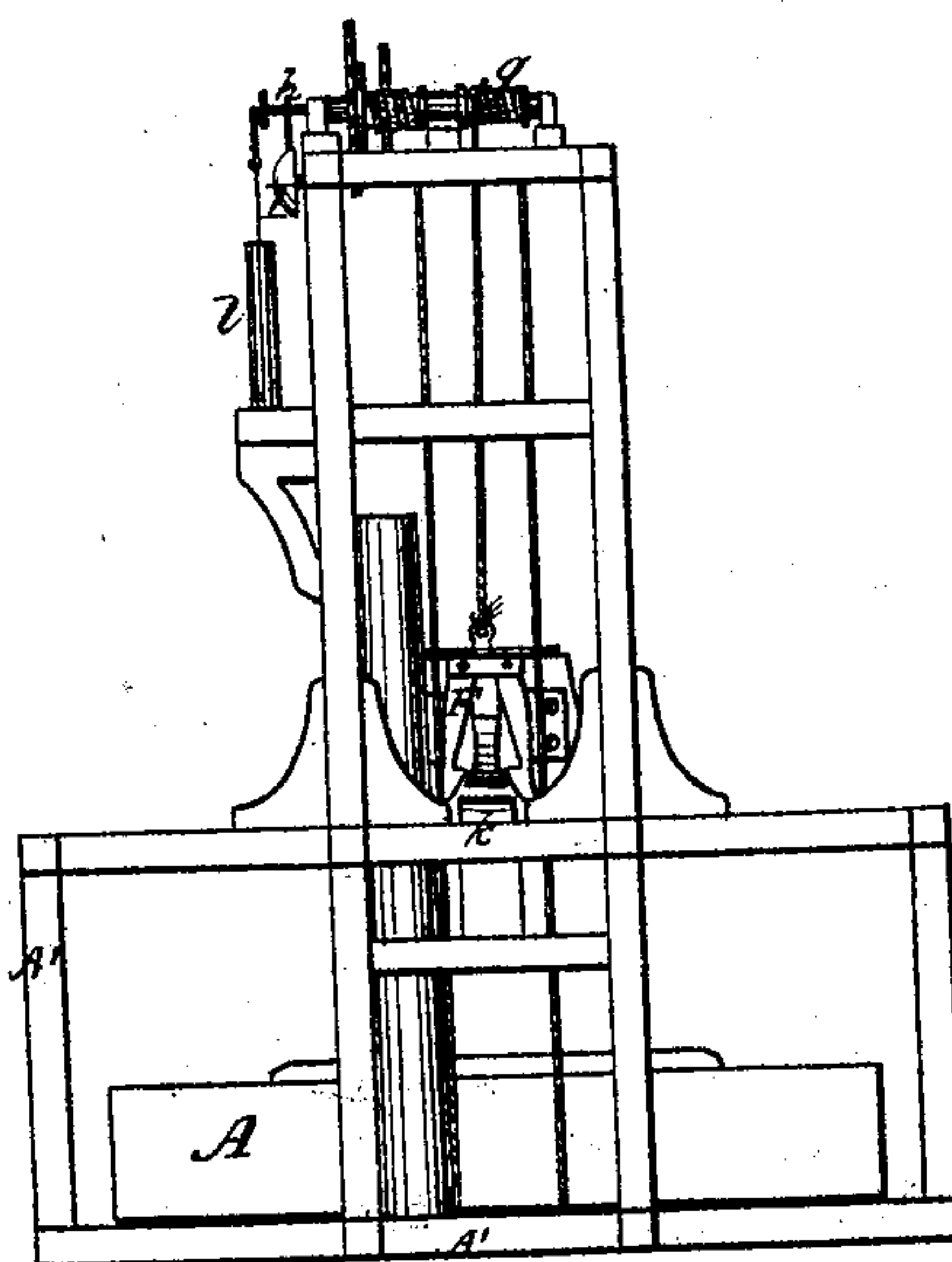


Fig. 6



Witnesses

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Attorney.



# UNITED STATES PATENT OFFICE.

WILLIAM A. STEWART, OF BETHEL, ASSIGNOR OF ONE-HALF HIS RIGHT  
TO TILSON H. DINSMORE, OF SKOWHEGAN, MAINE.

## IMPROVEMENT IN FOG-SIGNALS.

Specification forming part of Letters Patent No. **145,915**, dated December 23, 1873; application filed  
July 21, 1873.

*To all whom it may concern:*

Be it known that I, WILLIAM A. STEWART, of Bethel, in the county of Oxford and State of Maine, have invented certain new and useful Improvements in Automatic Stationary Fog-Signals.

My improvements relate to that general class of signals which are intended for light-house or beacon service, and which require mechanical power for their operation, and more particularly to that special class in which the movement of the adjacent waters is relied upon for furnishing the requisite initial power.

My invention consists, mainly, in the novel combination of a float, levers, drums, and weights with the signal apparatus, whether bell or whistle, in such a manner that the vertical movement of the water during flood and ebb tides will constantly maintain the weights in working position on the drums. My invention further consists in certain minor details hereafter fully described; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a true and accurate description of an apparatus embodying my invention.

As heretofore constructed, automatic stationary fog-signals operated by the action of the closely-adjacent waters, have generally relied upon the surface-currents or the wave-motion to furnish the motive power. Such signals are practically operative, and are of great value; but it is well known that at such times as the fogs are apt to be the densest the surface-currents are even less rapid, and the motion of the waves is reduced to a minimum; and, therefore, at the very time when the signal is most needed it is liable to be imperfectly operated, if at all.

With my apparatus the vertical movement of the waters in the rise and fall of the tides, furnishes the initial motive power, and, therefore, as the tides always rise and fall, the signals can never fail so long as the operative mechanism is in good order. To render the vertical movement available I employ a lifting float, preferably air-tight, although the water-tight scow-float would serve with approximate results. This float is kept in proper position by means of guides or posts, and is ar-

ranged during its rise and fall to engage, by means of intermediate mechanism, with certain weight-carrying drums, which are in turn geared to the signal-operating mechanism; but more particularly to describe my invention I will refer to the accompanying drawings, in which—

Figure 1 represents, in perspective, an apparatus which embodies my invention. Fig. 2 represents the same in longitudinal vertical section on line X Y. Fig. 3 represents the same in cross-vertical section on line Y Z. Fig. 4 represents the gearing of same in top view. Fig. 5 represents the apparatus in end view, with the float-lever raised. Fig. 6 represents the same with the float-lever down.

A denotes the float from which the initial power is derived. In this instance it is represented as a square air-tight chamber. It may be constructed after the manner of a scow, if desired, and composed of any suitable material. The float will, preferably, be embraced within an inclosure or skeleton structure, the vertical interior sides of which may serve as guides for maintaining the float in proper position during its vertical movement. The character of the substructure or frame-work  $A^1$  may be varied to suit the requirements in each particular instance. Ordinarily, it will consist of a heavy mud-sill, suitable uprights, and plate-timbers. As shown in the drawings, four vertical tie-posts,  $A^2$ , extend upward from the central mud-sills to the central frame-timbers, which are on a level with the top of the main frame. These tie-posts pass through wells in the float, and serve to strengthen the central portion of the frame. B denotes, in each instance, one of two vertical pivoted float-arms. Each is pivoted to the upper portion of the float adjacent to its center, and is so acted upon by one or more retractile springs, as at  $a$ , that their upper ends are always, with more or less force made to bear or press toward each other. The upper ends of the float-arms are inclined so as to present corresponding wedge-like surfaces on their coincident sides. Each float-arm is provided with a lifting-stud, as at  $b$ , and the two studs are horizontal and coincident. C denotes, in each instance, one of four vertical posts, which are mounted on the central portion of the frame, and located so as to form a



hollow square. Between the inner coincident faces of each pair on each side, respectively, are the two float-arms B. Each pair of posts are connected near their upper ends by a rod, which is covered with a loose bushing, as at *d*. D denotes the main float-lever. It is pivoted at one end to the top of the substructure, and extends from that point beyond the opposite end of the main frame, and is more or less heavily weighted at or near its outer end. The mode of connecting it with the float may be varied to an extensive degree. In this instance, I have pivoted to the two posts C farthest from the pivot of the lever D a bifurcated auxiliary lever, E, the arms of which are pivoted, respectively, to the inner coincident faces of the said posts in such a manner that the lever D is embraced between them. The free or outer ends of the parts of the lever E are united by a rod which is embraced within a loose bushing, as at *e*, and said bushing and rod occupy laterally a curved cam-slot, *f*, in the lever D. It is by this auxiliary lever that the main lever is raised, in the following manner: As the float rises the studs *b* on the float-arms B come into contact simultaneously with the two sides of the bifurcated lever E, which, on being raised, lifts the lever D by contact therewith, as at *e*, and this lifting movement continues until the inclined faces of the upper ends of the float-arms, by contact with the rods and bushings at *d*, are forced apart, so far as to disengage the studs *b* from the lever E, at which time said levers fall to their normal position. F denotes a two-armed grapple-hook, which is attached to one end of a cord or chain, which is wound upon a drum, *g*, loosely mounted on the shaft *h*, which is in turn, by means of a ratchet, operatively connected with said shaft, and the cog-wheel *i* mounted thereon. The drum *g* is made in two parts, on one of which, as at *g'*, another cord or chain is wound, to which is attached the actuating-weight G, which is provided with a well-casing of suitable size and depth. To raise the actuating-weight, the lever D, when elevated, engages with the grappling-hooks, and when it falls carries the hooks down, which turns the drum, and as the actuating-weight cord is wound thereon from the opposite side, said weight is raised to its highest point. On reaching its lowest point, the lever D forces the lower inner inclined faces of the grappling-hooks against corresponding faces on a base-block, as at *k*, which so spreads the said hooks apart that they are wholly disengaged from the lever, and are free to be drawn back to their normal position by the descent of the weight G. The grappling-hooks are provided with wire guides for maintaining them in proper position to engage with the lever. H denotes one of the signals, and I the other. Either or both may be employed, singly or in conjunction. The only signals which are available in fogs are those which appeal to the ear. The signal H is an air-whistle supplied by air from the pump *l*, which is actuated from

the main shaft *h* by suitable intermediate gearing. The signal I is a fixed bell with its striker intermittently operated by rotative mechanism; also, operated through the same mechanism by the main shaft.

Grappling-hooks operating substantially as those shown, arranged to engage with the float in its downward movement, and released therefrom by means the equivalent of those already described, can obviously be arranged to operate other drums and raise other weights connected by suitable gearing with the signal-operating mechanism, and thus utilize the entire movement of the float. In fact, it is possible, by obvious mechanical arrangements, to hold at all times any desired reserve force of actuating-weight power, and by that means any system of varying sounds may be adopted and carried into practice—as, for instance, by well-known coarse clock-work, the whistle may be sounded at short or at long intervals, and with any variation desired; so, also, a bell can be struck at long or short intervals, or any variation between the two, and thereby not only serve as a general alarm or warning against danger, but will also serve as a special indicator of precise localities—as, for instance, Prospect Head might be known to sound a signal of three bells, followed by a rest, and so on, or by any other predetermined system of sounds.

The mechanism can all be coarsely but strongly constructed, and incased within a beacon-tower having a central open sea-tank, or be simply protected by driven piles.

Although actuating-weights are deemed preferable to springs, I am aware that the latter may be employed with closely approximate results, and I therefore do not limit myself to actuating-weights *per se*, as springs are considered as equivalents thereof when employed in similar connection.

The time to be consumed in the downward movement of the actuating-weights can be regulated by means which are well known in the clock-making art, and as the avoirdupois of each weight may be as great as may be necessary, power may be derived therefrom to any desired degree.

Chains for pulley-work may be employed, although it is believed that wire-rope, properly protected against corrosion from the salt air, will be preferable.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

In combination with the float and the sounding-signals, the float-arms, the main float-lever, the auxiliary lever, the grappling-hook, drum, weight, and intermediate gearing, connected for operating the signals, substantially as described.

WILLIAM A. STEWART.

Witnesses:

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