

(No Model.)

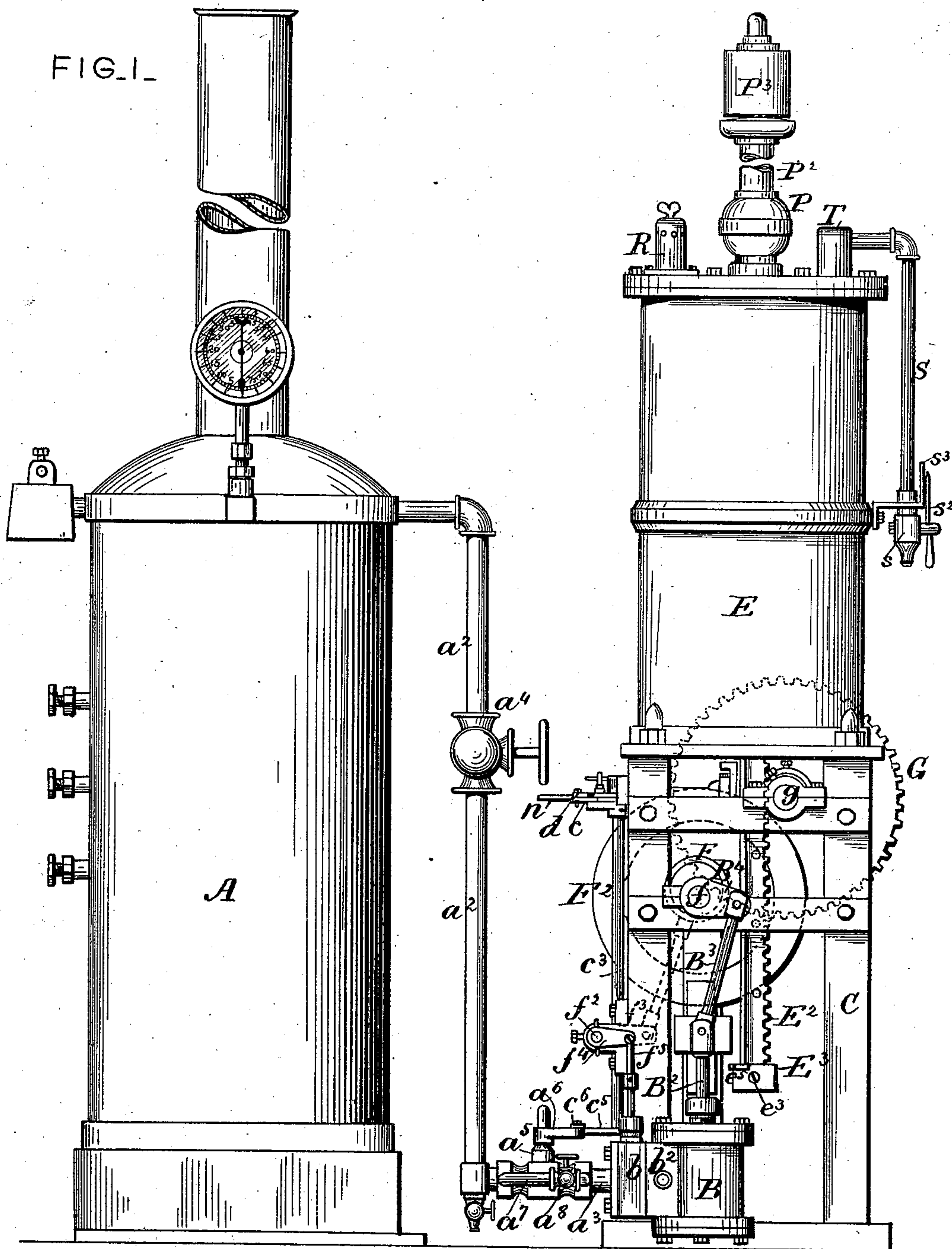
4 Sheets—Sheet 1.

J. B. TARR.
FOG SIGNALING APPARATUS.

No. 547,903.

Patented Oct. 15, 1895.

FIG. 1.



WITNESSES

INVENTOR

A. B. Degges
L. S. Heinicke

John Blake Tarr,
by E. E. Masson Attorney.

(No Model.)

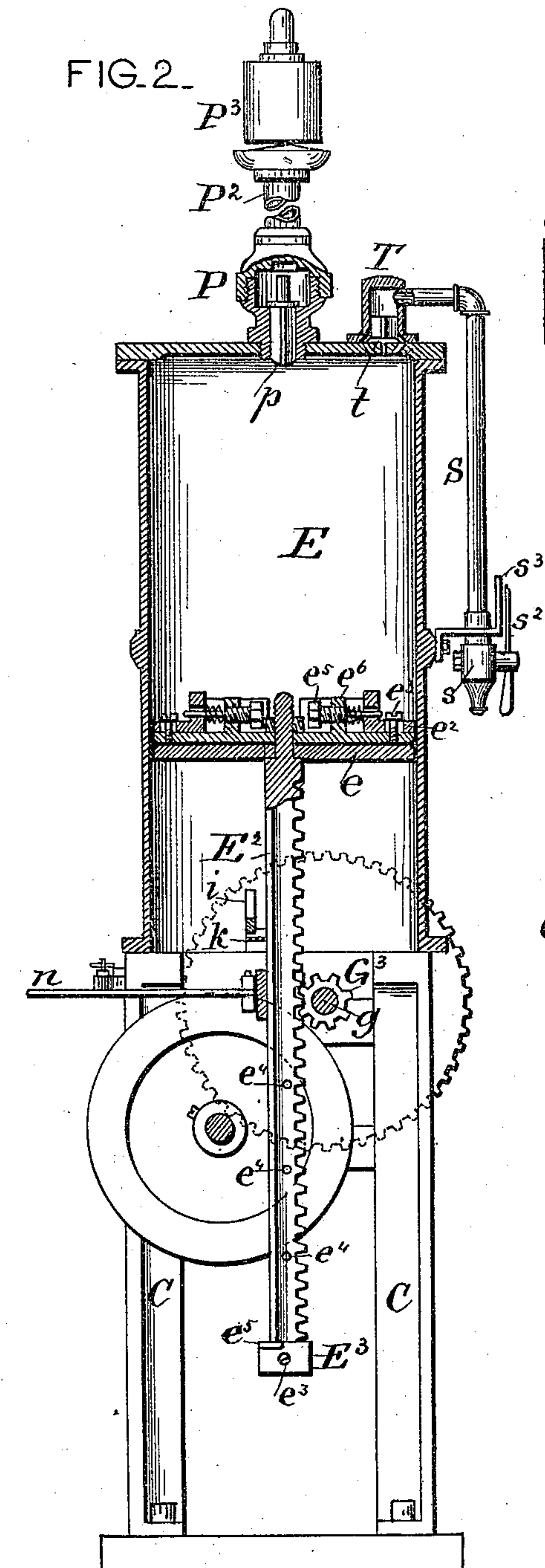
4 Sheets—Sheet 2.

J. B. TARR.
FOG SIGNALING APPARATUS.

No. 547,903.

Patented Oct. 15, 1895.

FIG. 2.



WITNESSES

A. B. Deggs
J. D. Heinrichs

FIG. 3.

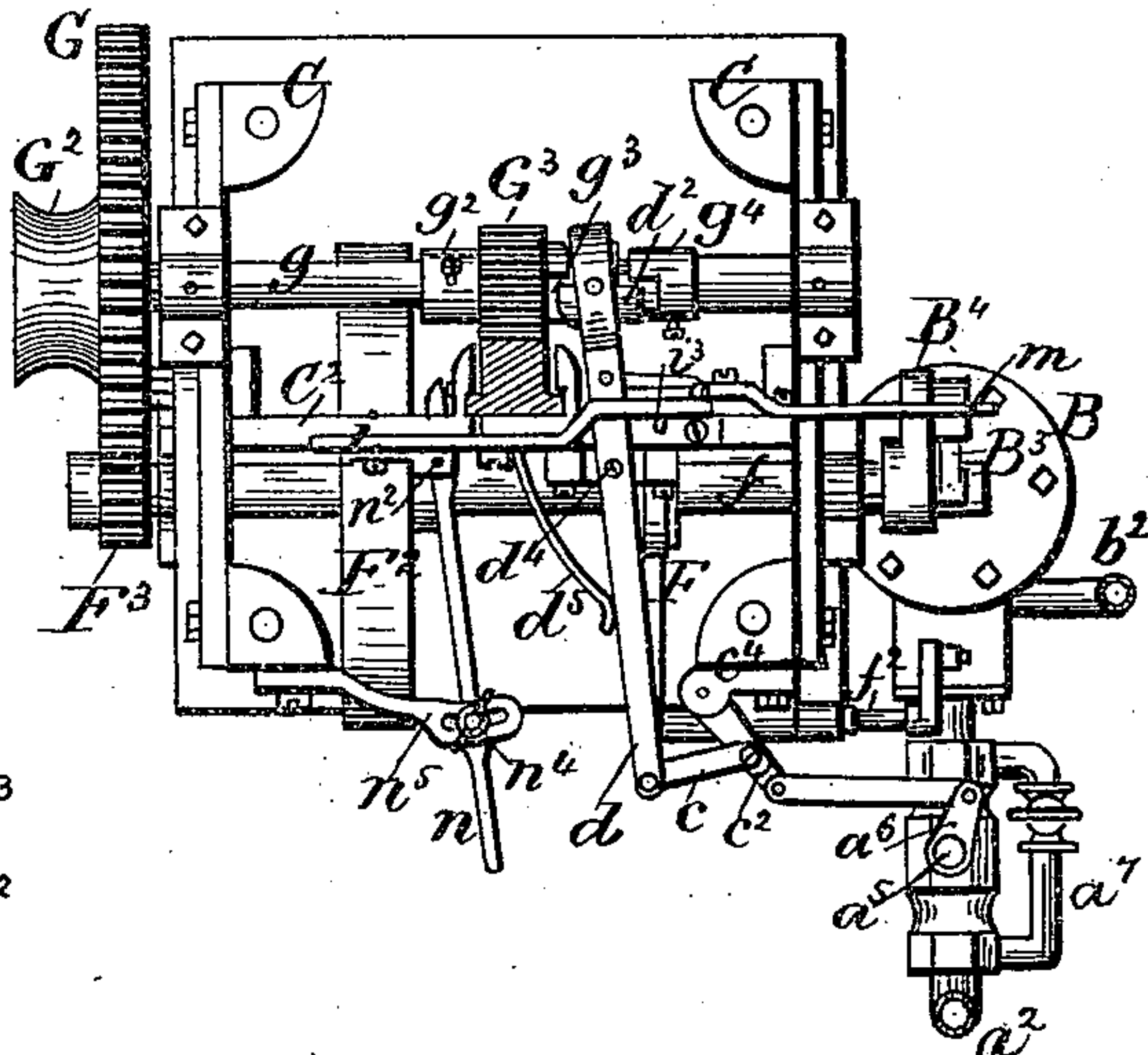
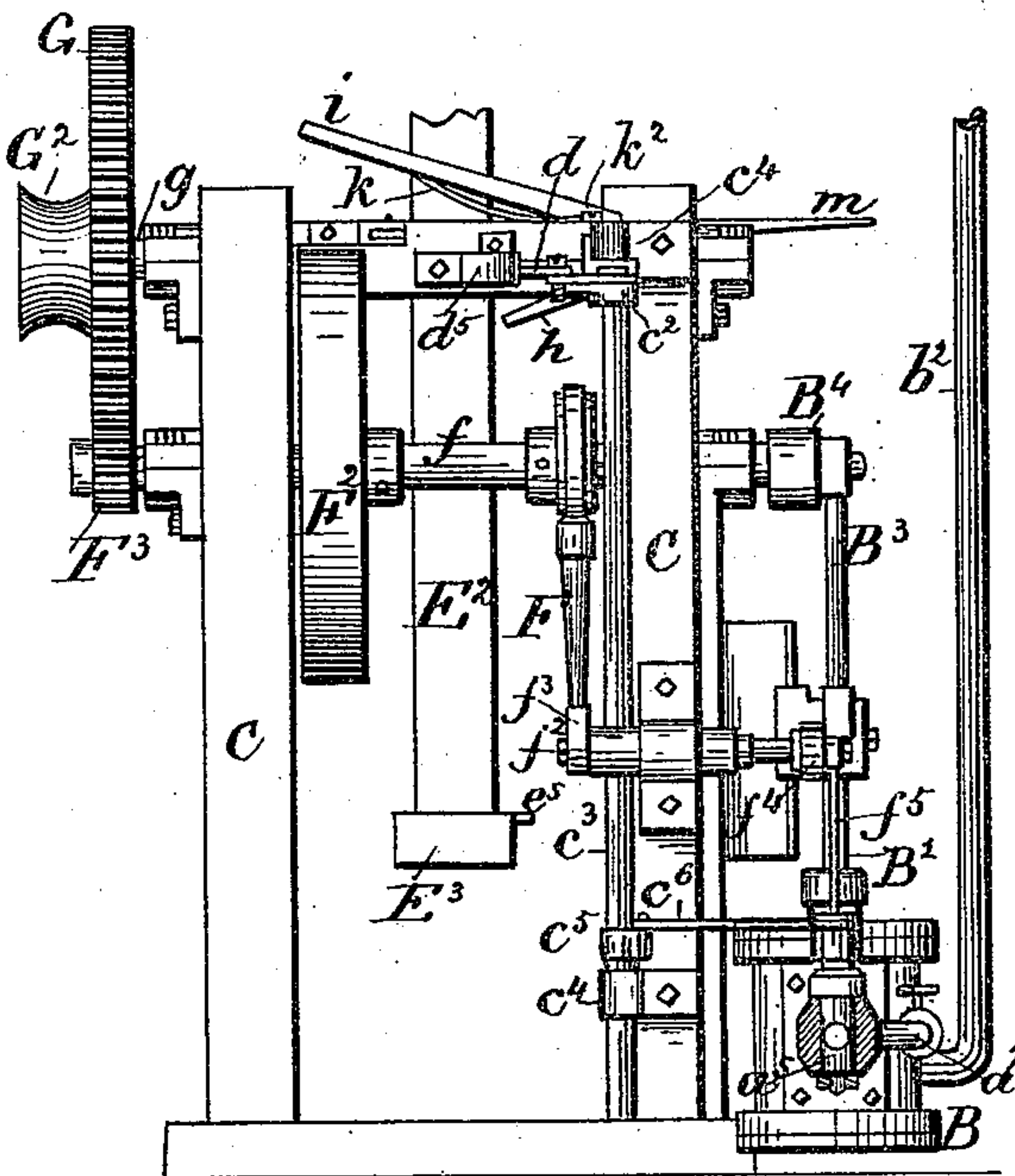


FIG. 4.



INVENTOR

John Blake Tarr
by *E. E. Masson* Attorney

(No Model.)

4 Sheets—Sheet 3.

J. B. TARR.
FOG SIGNALING APPARATUS.

No. 547,903.

Patented Oct. 15, 1895.

FIG. 5.

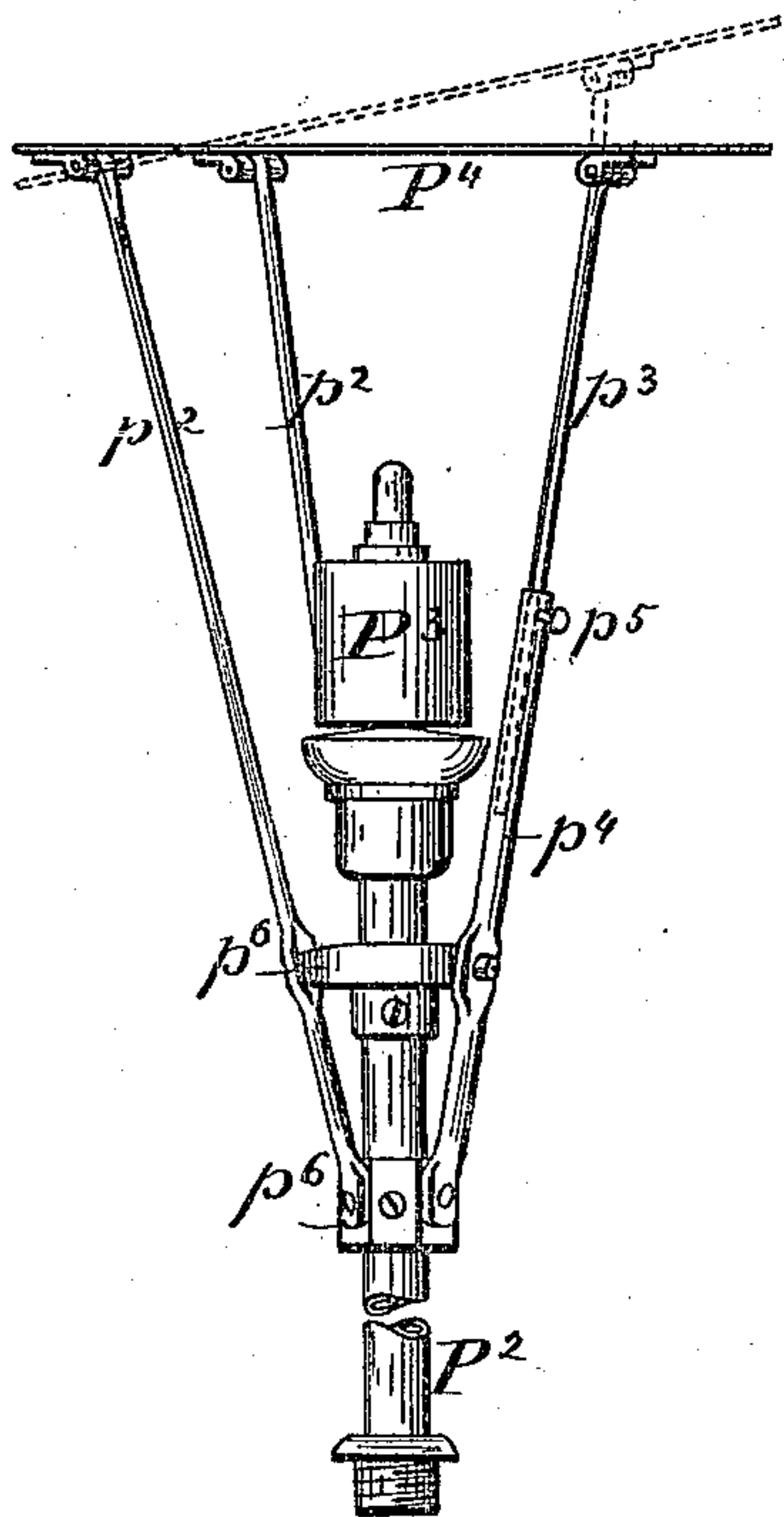


FIG. 6.

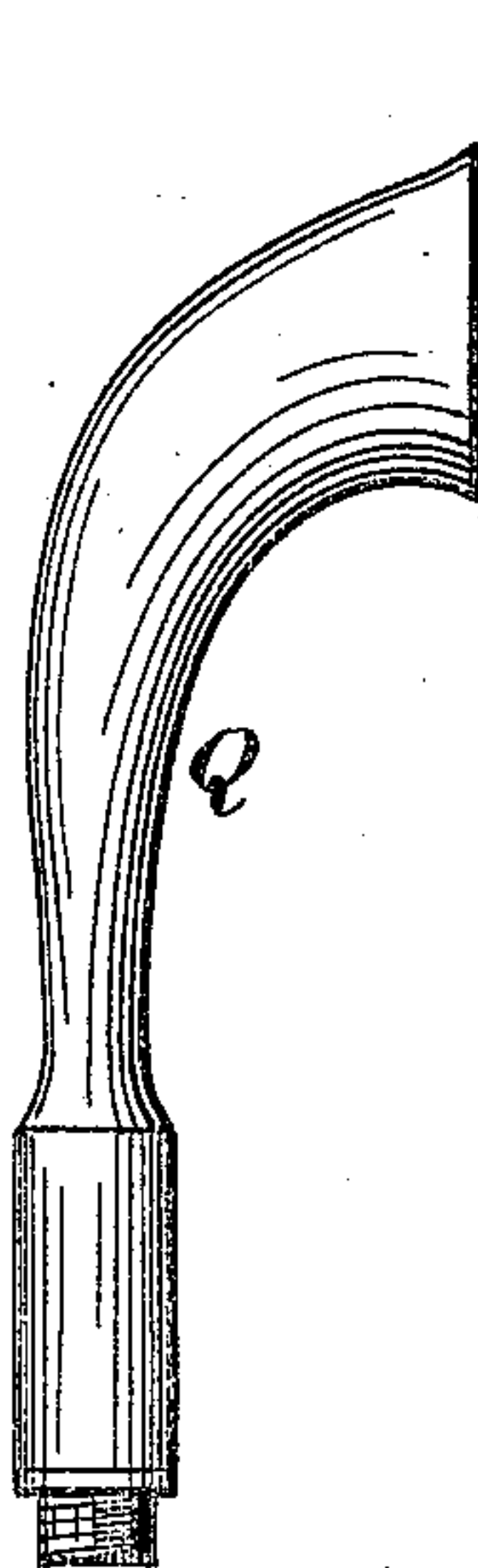


FIG. 7.

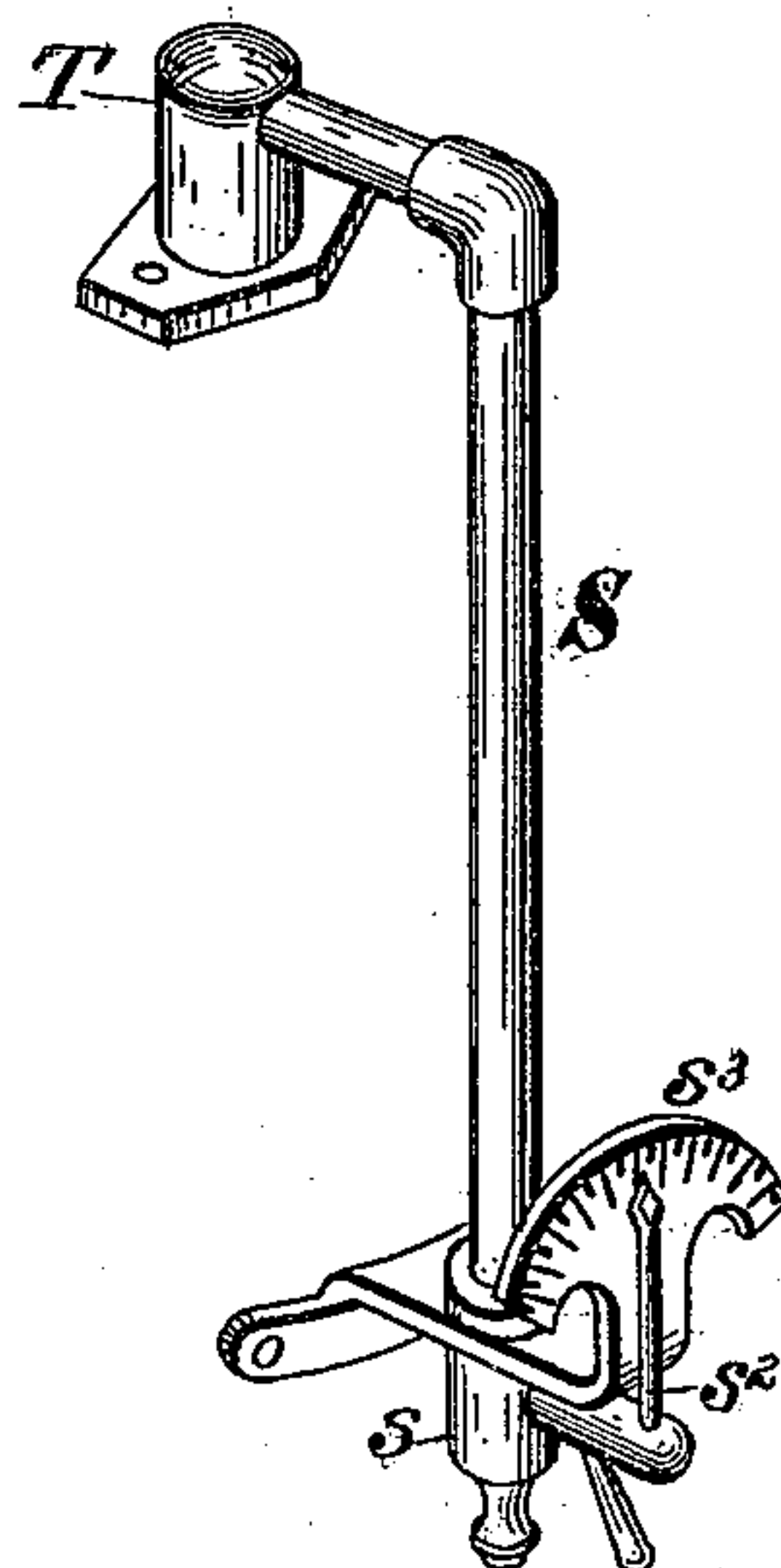


FIG. 8.

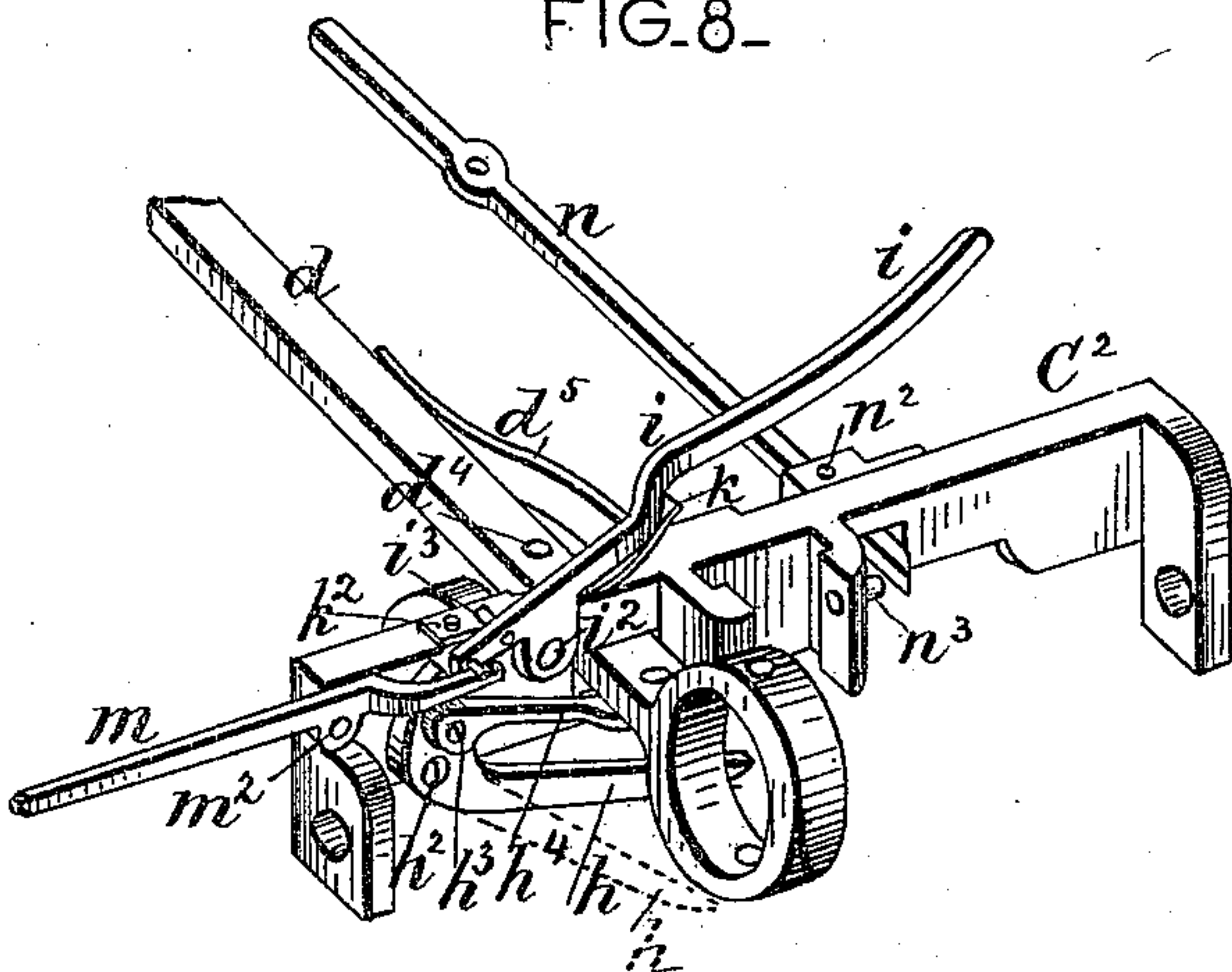


FIG. 9.

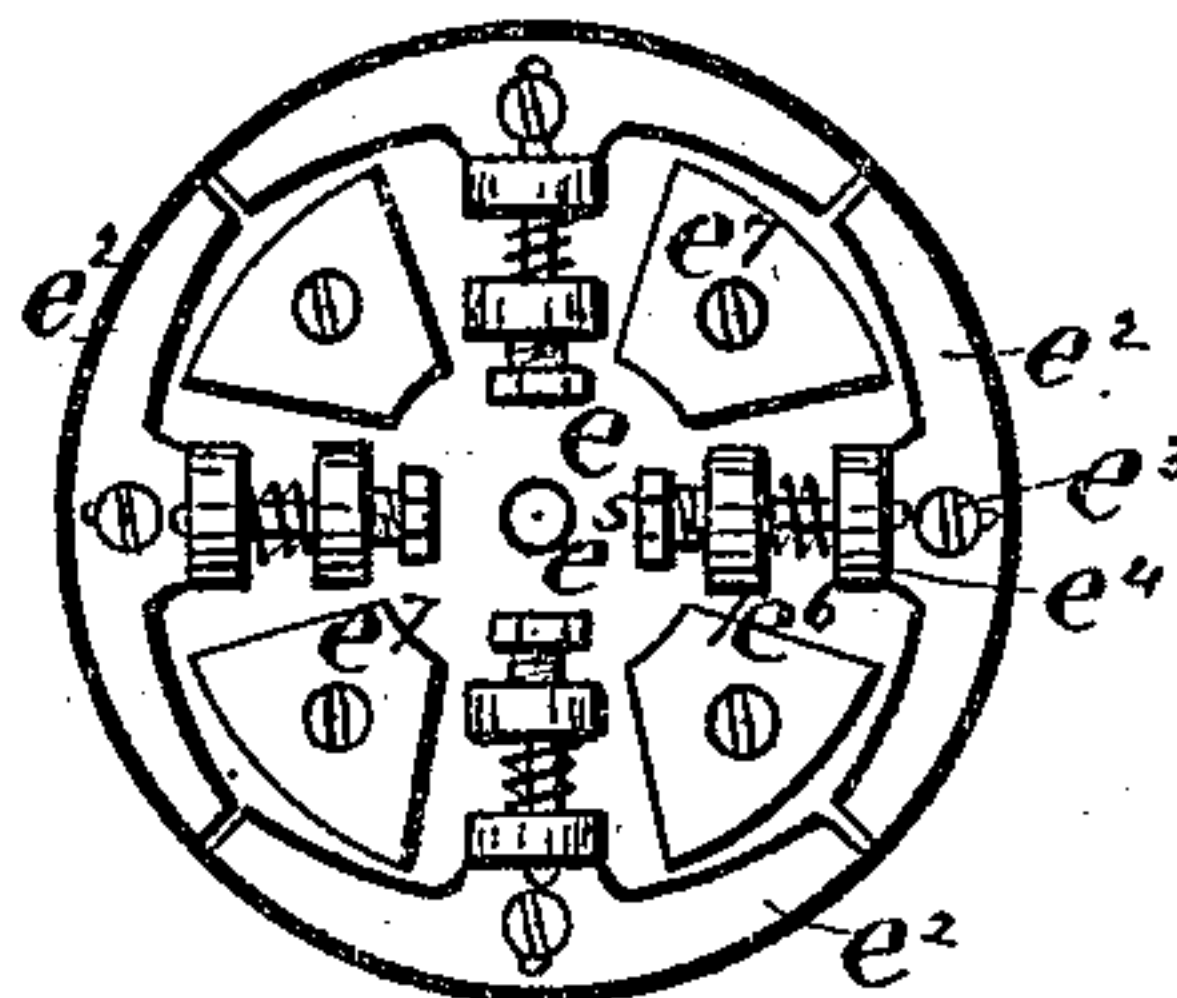
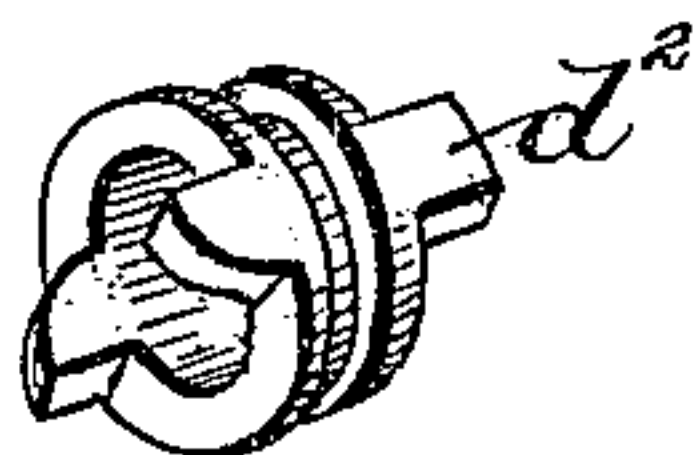


FIG. 10.



WITNESSES

A. B. Digges
L. D. Heinrichs

INVENTOR

John Blake Tarr,
by E. E. Masson Attorney.

(No Model.)

4 Sheets—Sheet 4.

J. B. TARR.
FOG SIGNALING APPARATUS.

No. 547,903.

Patented Oct. 15, 1895.

FIG. 11.

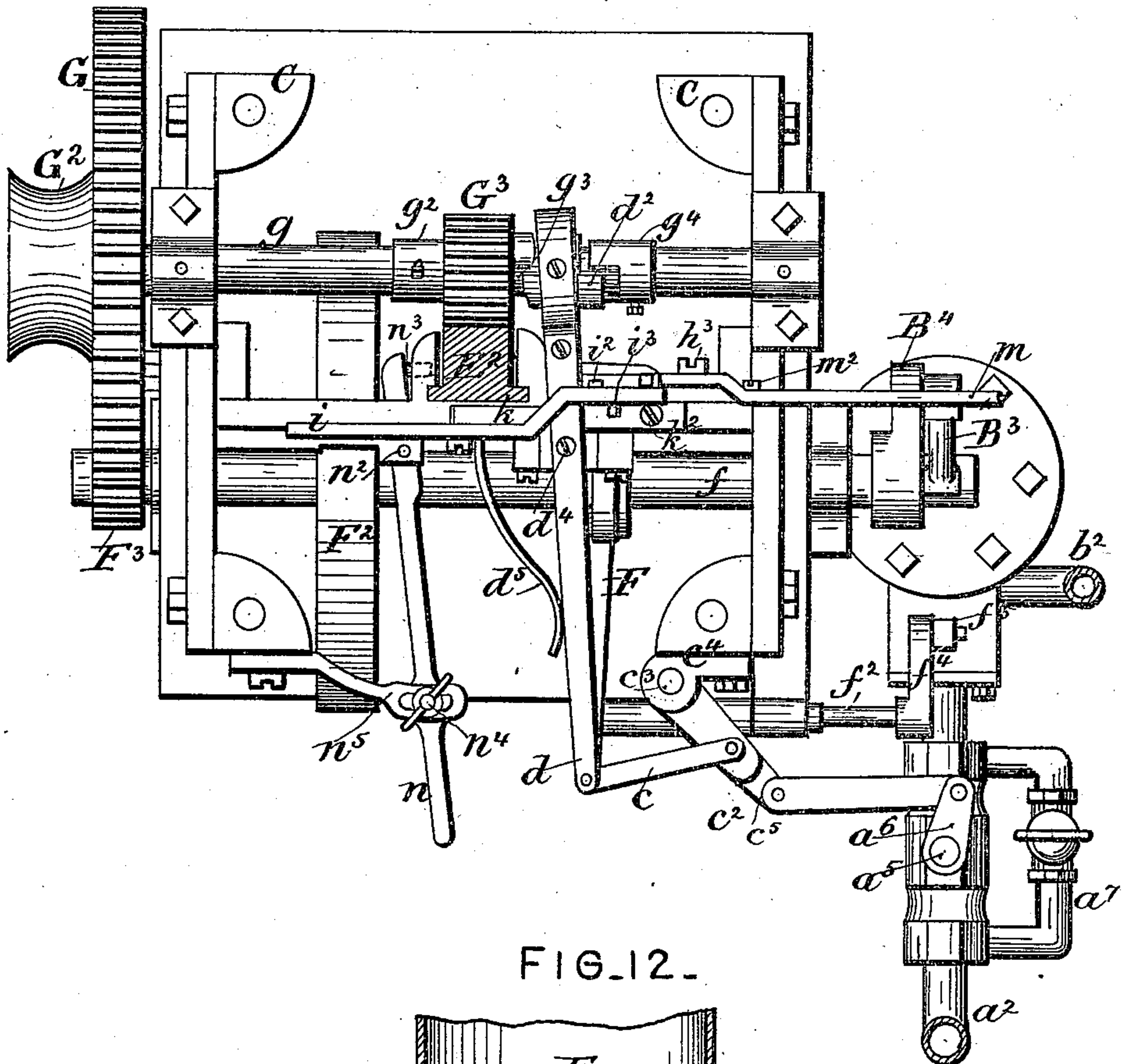
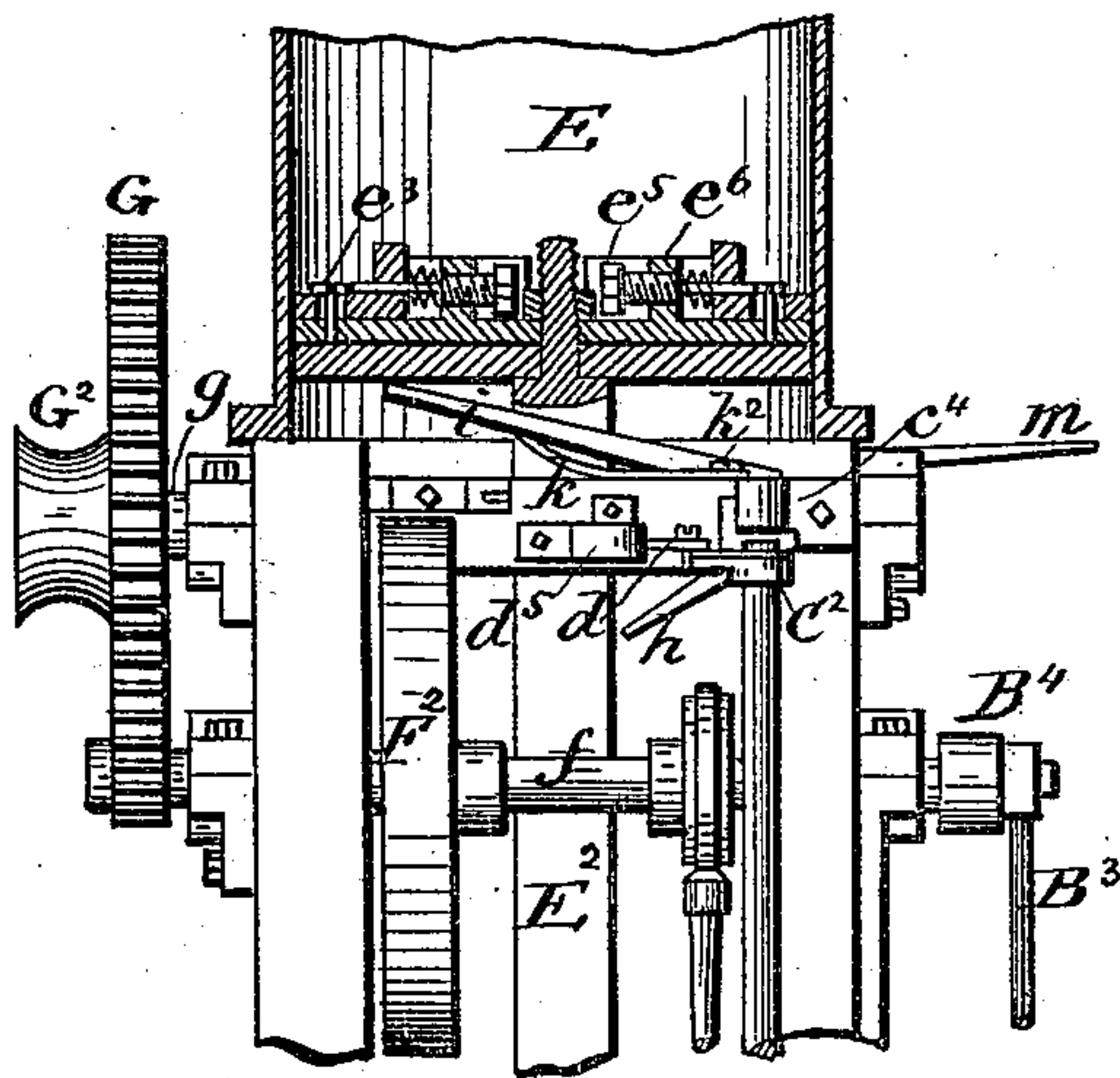


FIG. 12.



WITNESSES

A. B. Degges
L. D. Heinrichs

INVENTOR

John Blake Tarr,
by E.E. Masson Attorney.

UNITED STATES PATENT OFFICE.

JOHN BLAKE TARR, OF NEW BEDFORD, MASSACHUSETTS.

FOG SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 547,903, dated October 15, 1895.

Application filed September 19, 1893. Serial No. 485,794. (No model.)

To all whom it may concern:

Be it known that I, JOHN BLAKE TARR, a citizen of the United States, residing at New Bedford, in the county of Bristol, State of Massachusetts, have invented certain new and useful Improvements in Fog Alarm and Signaling Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement upon the fog-alarm for which a patent was granted to me February 25, 1879, No. 212,635; and the objects of my improvement are to provide a simple and inexpensively-operated machine for light-houses and light-ships, to be used for signaling during fogs and snow-storms when their lights are thereby obstructed. The air used in this machine being compressed by steam-power can be made to blow a whistle or a fog-horn with such force that they can be heard distinctly at a distance of ten or more miles.

Another object is to provide in the machine certain simple means to automatically and accurately regulate the length of time occupied by the full blast of each machine located in the same neighborhood, as said length of time must necessarily be different to permit mariners to locate thereby the location of their vessels.

I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a front view of a complete machine constructed in accordance with my invention and includes a steam-boiler to furnish the steam to the engine. Fig. 2 is a vertical central section through the air-blower cylinder, its valves, and piston and showing its supporting-frame and a portion of its operating mechanism. Fig. 3 is a top view of the supporting-frame of the blowing-cylinder with the latter removed, but showing the operating and controlling mechanism of the device. Fig. 4 is an end view of the device, showing its operating and controlling mechanism with the blowing-cylinder removed. Fig. 5 is a side view of the whistle-carrying pipe and the adjustable sound-deflector for said whistle. Fig. 6 is a side view of a fog-horn which may be substituted for the whistle. Fig. 7 is a perspective view of the pipe

used to lead air within the top of the blowing-cylinder to permit the descent of the piston within the said cylinder, the speed of said descent being controlled by the size of the passage within the pipe. Said passage is regulated by a cock at the lower end of said pipe, the plug of said cock carrying an index-finger, which can be set opposite any one of the divisions on an indicator-plate secured above the cock. Fig. 8 is a perspective view of the frame carrying the clutch-lever and of the trip-levers used to automatically and also manually shift the clutch-lever. Fig. 9 is a plan view of the piston of the blower-cylinder. Fig. 10 is a perspective view of the circumferentially-grooved clutch-ring of the machine. Fig. 11 is a top view of the supporting-frame of the blower-cylinder as shown in Fig. 3, but on a larger scale. Fig. 12 is a vertical section of the lower portion of the blower-cylinder and its piston with a portion of the cylinder-supporting frame and the piston in the act of bearing upon the upper tripping-lever.

In said drawings, A represents a steam-boiler, preferably of the form known as "vertical tubular," from which steam is conducted through the pipe a^2 to the steam-chest b of the engine by means of a pipe a^3 branching laterally from the bottom of the pipe a^2 . Upon the pipe a^2 there is a valve a^4 , that can be closed by the operator when desired, and upon the pipe a^3 there is a cock a^5 , that is automatically closed by the clutch-lever d of the machine as soon as the piston e of the blower-cylinder E reaches the upper end of its course and is again automatically opened by the inverse motion of the clutch-lever d as soon as the piston e reaches the lower end of its course. For this purpose the outer end of the clutch-lever, Fig. 3, is connected by means of a link c with a crank-arm c^2 , secured to the upper end of a vertical shaft c^3 , pivotally retained in bearings c^4 , secured to the frame C, that supports the blowing-cylinder and other parts of the machine. The lower portion of the shaft c^3 carries also a crank-arm c^5 , that is united by means of a connecting-rod with the handle a^6 of the cock a^5 .

As the steam cylinder B of the engine that forces upward the piston e of the blowing-

cylinder is comparatively small to reduce the amount of steam used, said engine is intended to be run at a high rate of speed, probably one thousand revolutions of the crank-shaft per minute, and it is desirable that the engine should respond instantly to the starting motion of the operator without danger of finding the engine on the dead-center, the engine is intended to be kept under very slow motion. For this purpose a short steam-pipe a^7 , passing on the side of the cock a^5 , has its ends connected with the steam-pipe a^3 in front and rear of said cock, and the capacity of said pipe a^7 is controlled by a cock a^8 . Said pipe a^7 may have one end attached directly to the boiler, if desired. The exhaust-steam from the cylinder B escapes through the pipe b^2 , that is extended upward any desired distance.

The steam-power exerted upon the piston and piston-rod B^2 of the cylinder B is transmitted by means of the connecting-rod B^3 to the crank B^4 on the shaft f . Said shaft is mounted in suitable bearings on the frame C and carries an eccentric, eccentric-strap, and rod F, through which an oscillatory motion is given to a short shaft f^2 , pivotally retained in a wide bearing secured to the frame C. Said shaft carries at one end a crank f^3 , pivoted at its outer end to the eccentric-rod and at the other end a crank f^4 , having its outer end pivoted to the adjustable slide-valve rod f^5 . The shaft f carries also a fly-wheel F^2 , and on its outer end a pinion F^6 , that meshes with a gear-wheel G on one end of a shaft g , carried in suitable bearings upon the frame C on a higher level than the shaft f . Said gear-wheel G carries on its outer face a drum G^2 , around which a rope can be wound and be used for hoisting coal or other substances with the engine of the apparatus into light-houses or light-ships in which it may have been located. Upon the shaft g there is also loosely mounted about midway of its bearings a pinion G^3 , that is made to mesh with the rack piston-rod E^2 of the piston e of the blower-cylinder. One of the faces of the pinion G^3 bears against a collar g^2 , secured upon the shaft g , but the opposite face of the pinion is provided with a short collar having a groove g^3 lengthwise thereof to be used as one member of a clutch. The second member consists of a feather d^2 , that is carried by a circumferentially-grooved sleeve that is received within a ring formed on the inner end of the clutch-lever d . Said sleeve and feather are retained pivotally connected, as usual, with the ring of the clutch-lever by means of two pins or short screws inserted into the periphery of said ring and having their inner ends received into the circumferential groove of sleeve or feather d^2 . The outer end of said feather is made to slidingly fit within a groove formed lengthwise of a collar g^4 . The groove g^3 in the collar of the pinion G^3 is of greater width than the width of the feather d^2 to insure the entrance of said feather within said groove and to permit the shaft g to have a full head of motion before

it begins to rotate the pinion as the latter is loaded by the pump-piston. The clutch-lever d is passed through a horizontal slot in a horizontal bar C^2 , that forms a part of the frame and unites together the upper portion of its uprights C. The bar C^2 has formed on one of its sides a narrow shelf, to which the lever d is pivoted at d^4 . When the piston e is ascending, the feather of the clutch-lever is normally retained in engagement with the pinion G^3 by means of a spring d^5 , pressing against the inner side of said clutch-lever on the end thereof opposite the feather-carrying ring.

To automatically unclutch the pinion G^3 when the piston e has reached the upper end of its predetermined course, the piston-rod E^2 carries adjustably thereon a rectangular sleeve E^3 , that is secured thereto by a screw e^3 , the point of which is made to enter either one of the holes e^4 in the side of the piston-rod. As shown in the drawings, said sleeve is secured to the lower end of the piston-rod to permit the latter to make a full stroke before the pinion G^3 is unclutched from its shaft. To automatically unclutch said pinion when the piston e has reached the upper end of its course, the sleeve E^3 upon its rack-rod E^2 has a lateral projection e^5 , that comes into engagement with the end of the lower arm of an angular lever h , that is pivoted at h^2 to the side of the horizontal bar C^2 of the frame. The upper arm of the angular lever h has pivoted to its side at h^3 , Fig. 8, one end of a link h^4 , that has its opposite end pivoted to the ring end of the clutch-lever, and thus pulls said ring end sidewise, and with it the clutch-finger, and thus leaves the pinion free to rotate on its shaft under the impulse of the descending rack-rod and piston, the weight of said rack-rod being sufficient for that purpose, as the piston carries suitable weights, as will be described.

During the descent of the piston the lower arm of the angular lever h is retained in a nearly horizontal position by having the point of its upper arm come into engagement with the inner end of a trip-lever i , that is pivoted at i^2 to the side of the horizontal bar C^2 . The outer end of the trip-lever is kept normally in a partly-elevated position by a flat spring k pressing it, the inner end of said spring being secured at k^2 on top of the bar C^2 . A pin i^3 , projecting from the side of the inner end of the trip-lever i , rests on top of the secured end of the spring k and prevents said inner end of the trip-lever from being depressed too much by the upward pressure of the spring k . When the piston e reaches nearly the lower end of its course, it presses upon the outer end of the trip-lever i and the inner end of said lever becomes tilted upward and releases the angular lever h , the upper arm of the latter becoming tilted under said inner end of the lever i , the lower arm of the angular lever h assuming then the position shown in dotted lines in Fig. 8, said position being maintained until the piston is again at the

upper end of its course. Said dotted-lines position of the lever h is caused by the spring d^5 pressing against the side of the clutch-lever d , causing its ring end to be swung away from the upper arm of the angular lever h and pulling on the latter by means of the link h^4 .

To permit the operator to produce with the machine a series of short blasts in quick succession—as, for example, if a vessel is dangerously close to a light-ship, a light-house, or rocks in its neighborhood—a hand-lever m is pivoted at m^2 to the side of the bar C^2 of the frame and has its outer end projecting beyond the side of the frame to serve as a handle for said lever, while its inner end is extended under a pin projecting from the side of the trip-lever i , adjacent to its inner end, by which means said inner end of the trip-lever can be lifted out of engagement with the upper arm of the angular lever h and permit the ring end of the clutch-lever d to swing laterally and its feather to enter into engagement with the clutch member of the pinion G^3 without requiring the piston e to descend sufficiently to press on the outer end of the trip-lever i .

To permit the pinion G^3 to remain loose upon its shaft g for any desired length of time when it is desired to use the steam-engine of the apparatus for hoisting coal or other objects, the operator takes advantage of the time that the pinion G^3 is loose upon its shaft, while the piston and its rack-rod are descending, and arrests its descent by clamping said rack-rod E^2 . For this purpose a lever n is pivoted at n^2 to a bracket secured to the side of the bar C^2 of the frame. The inner end of said lever is made to pass through a horizontal slot in said bar C^2 and press against the outer end of a sliding pin n^3 , passing through the side of one of the side bearings C^3 of the rack-rod, said bearings being integral with the bar C^2 and projecting from one of its sides. The outer end or handle of the lever n is adjustably retained by means of a thumb-nut mounted upon a bolt n^4 , projecting from said handle and passing through a slot in the outer end of an arm n^5 , having its inner end secured to the side of one of the standards of the frame C .

The piston e of the blower-cylinder consists, preferably, of two metal disks, between which two disks of leather are clamped, the upper disk of leather having its edge turned up and the lower disk of leather having its edge turned down. The turned-up edge is wider than the thickness of the upper metal disk, and the upper portion of said turned-up edge is kept in close contact with the inner face of the cylinder E by means of a suitable number of metal segments e^2 , that are loosely connected with the upper metal disk by means of screws e^3 , passing through radial slots in the segments e^2 . Each segment has a standing lug e^4 , against the inner face of which one end of a coil-spring is made to press, while the opposite end of said spring presses against

a shoulder formed upon a screw e^5 , passing horizontally through a lug e^6 , projecting from the upper face of the upper metal disk of the piston. To give the necessary gravity to the piston, a series of weights e^7 are secured on top thereof.

On top of the blower-cylinder E is mounted a valve-case P , containing a valve p , adapted to be opened by having it lifted a short distance by the compressed air in said cylinder. The valve-case has on top thereof a pipe P^2 , that may be ten or more feet high, to extend a suitable distance above the deck of a light-ship. On the upper end of said pipe is mounted a whistle P^3 of suitable size. Above the whistle there is placed a sound-deflecting plate P^4 , that is adjustably retained at any desired angle by divergent braces p^2 p^3 , having their upper ends hinged to the bottom of said plate. The lower portions of the braces p^2 are secured to two sleeves p^6 , adjustably retained upon the pipe P^2 , while the lower portion of the shorter brace p^3 is adjustably retained in a tubular brace p^4 by means of a bolt or screw p^5 , passing through the side of said brace p^4 , the lower end of which is also secured to the sleeves p^6 .

In place of the whistle a fog-horn Q may be substituted, in which case it is desirable to have a pressure-regulating valve R , of any well-known construction, mounted on top of the blower-cylinder to prevent the reed in the bottom of the horn from being injured by too great an air-pressure.

To regulate and adjust the speed at which the piston e descends within the blower-cylinder and thereby regulate the amount of time between each blast of the whistle or fog-horn, air is admitted above the piston through the top of the cylinder E by means of a pipe S , that has on its lower end a cock s , the plug of which carries radially thereof an index-finger s^2 , that is standing in front of a stationary index-plate s^3 , preferably secured to the side of the blower-cylinder. The position of the index-finger relatively to the marks on the face of the index-plate can be adjusted by partly rotating the plug of the cock by means of its handle. The upper end of the pipe S enters a valve-case T , secured on top of the blower-cylinder. Within said case is placed a valve t , that has its seat on top thereof in the walls of the valve-case, so that it is open when it drops down in the position shown in Fig. 2. As soon as the piston e begins to ascend and compress air above it, the valve t is forced upward by said air and closed against its seat, even before the valve p , controlling the whistle, is opened, as the valve t is of lighter weight than the valve p .

Having now fully described my invention, I claim—

1. In a fog alarm the combination of a vertical bottomless blower cylinder, a piston therein, a sound producing device as described mounted on the upper end of a pipe standing upon said cylinder and connected

with its interior, and a valve interposed between said sound producing device and the top of the bottomless blower-cylinder as described.

5 2. In a fog alarm the combination of a vertical bottomless blower-cylinder, a piston therein, a sound producing device as described mounted on a pipe connected with the interior of said cylinder, a valve interposed
10 between said sound producing device and the interior of the blower cylinder, and an air leading-in valve upon the top of said bottomless cylinder substantially as described.

3. In a fog alarm the combination of a vertical blower cylinder, a piston therein adapted to descend by its own gravity, a sound producing device and a valve thereunder mounted upon said cylinder, and an air leading-in valve also upon said cylinder, with a
20 pipe leading air to the latter valve and a cock upon said pipe.

4. In a fog alarm the combination of a vertical blower-cylinder, a piston therein, a sound producing device and a valve thereunder
25 mounted upon said cylinder, and an air leading-in valve also upon said cylinder, with a pipe leading air to the latter valve, a cock upon said pipe, the plug of which carries an index-finger, and an index-plate alongside of
30 said finger substantially as described.

5. In a fog alarm the combination of a vertical blower-cylinder, a sound producing device and a valve thereunder mounted upon said cylinder, a piston therein adapted to descend by its own gravity, its rack-rod, a sleeve adjustably mounted upon said rod, and a clutch lever actuated by said rod and sleeve substantially as described.

6. In a fog alarm the combination of a vertical blower-cylinder, a sound producing device and a valve thereunder mounted upon
40 said cylinder, a piston therein adapted to de-

scend by its own gravity, a trip lever adapted to be tripped by said piston, an angular lever released by said trip lever, a clutch lever
45 linked to the angular lever and a spring pressing the clutch lever substantially as described.

7. In a fog alarm the combination of a vertical blower-cylinder, a sound producing device and a valve thereunder mounted upon
50 said cylinder, a piston therein adapted to descend by its own gravity, its rack-rod, a pinion meshing with the rack of said rod, said pinion being loose upon its carrying shaft and
55 having a clutch member on one of its sides, with a clutch lever carrying the second clutch member substantially as described.

8. In a fog alarm the combination of a vertical blower-cylinder, a sound producing device and a valve thereunder mounted upon
60 said cylinder, a piston therein adapted to descend by its own gravity, a trip lever adapted to be tripped by said piston, and a hand lever *m* to trip said trip-lever and permit a
65 clutch lever to be automatically swung laterally substantially as described.

9. In a fog alarm the combination of a vertical blower-cylinder, a sound producing device and a valve thereunder mounted upon
70 said cylinder, a piston therein, a trip lever adapted to be tripped by said piston, the rack-rod of said piston, a pinion and its clutch member, and a clutch lever, with a steam
75 pipe, a cock thereon and means connecting the plug of said cock with the clutch lever substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN BLAKE TARR.

Witnesses:

E. E. MASSON,
A. B. DEGGES.