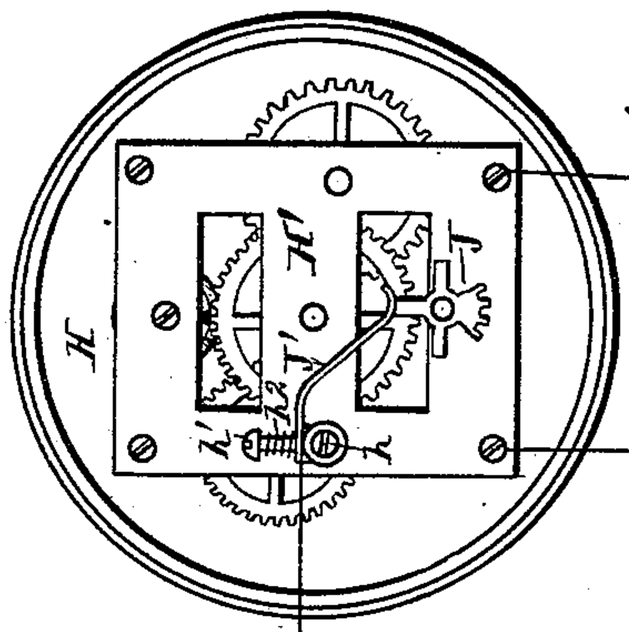
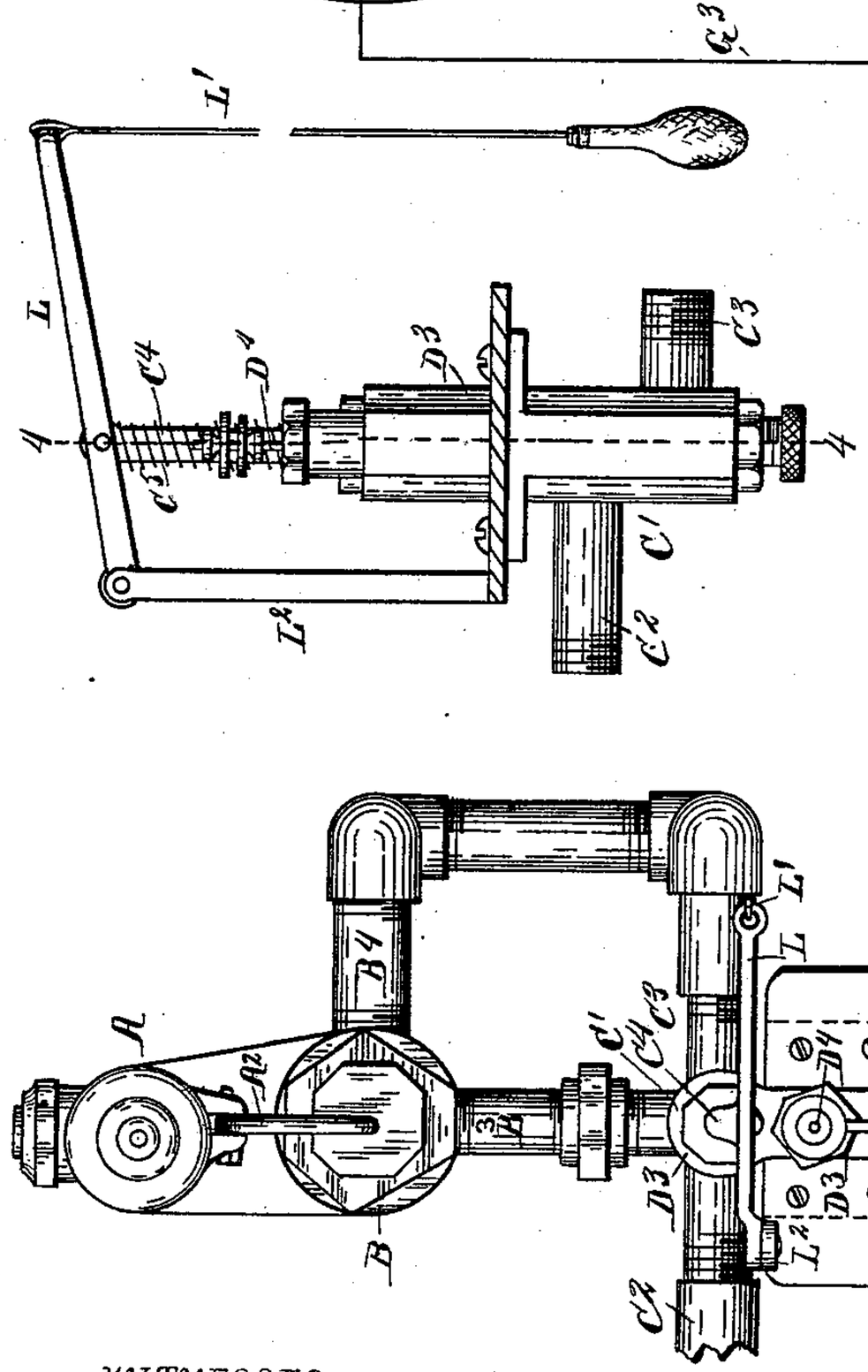
(No Model.) 2 Sheets—Sheet 1.

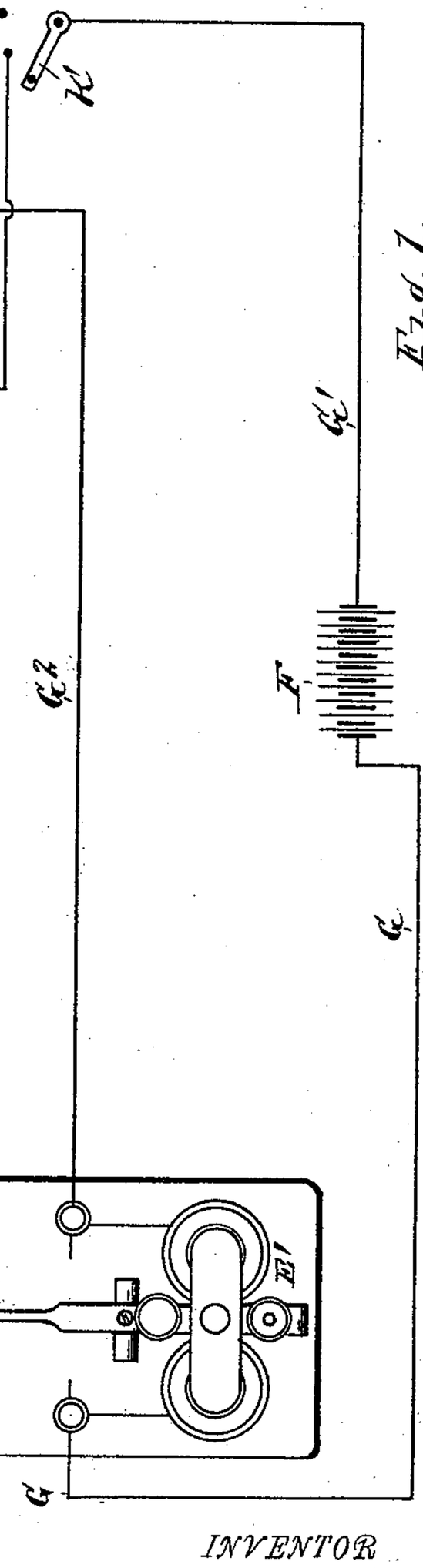
W. RYMER.

CODE SIGNALING DEVICE.

No. 541,505. Patented June 25, 1895.







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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

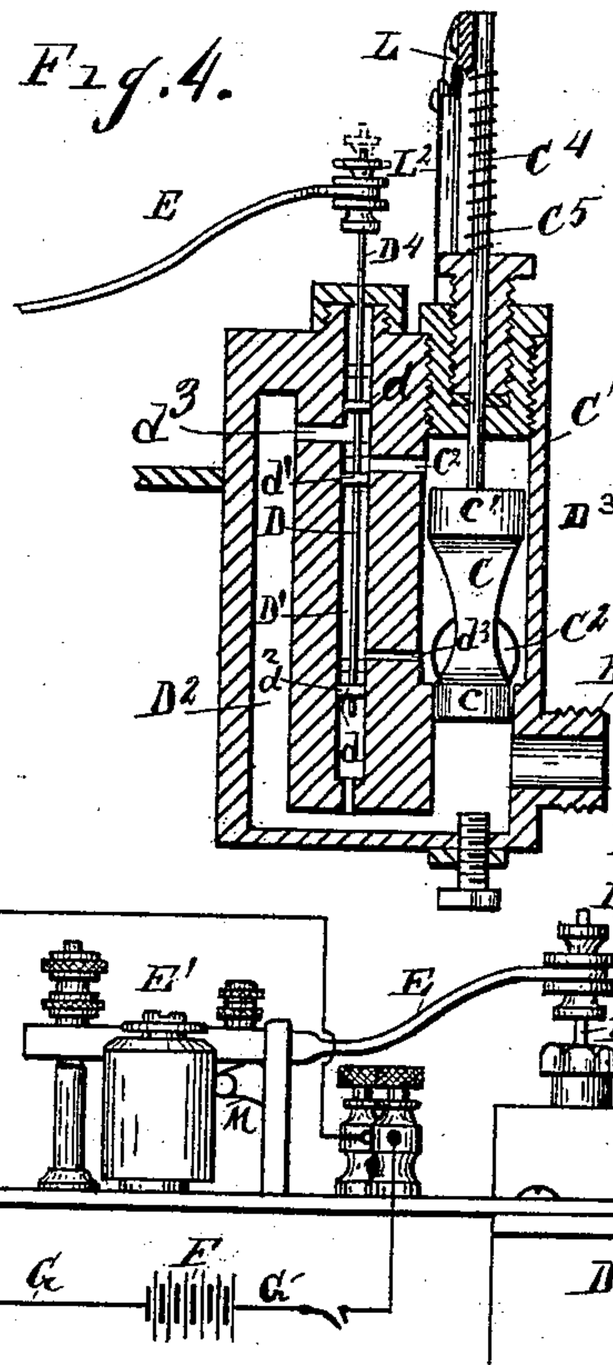
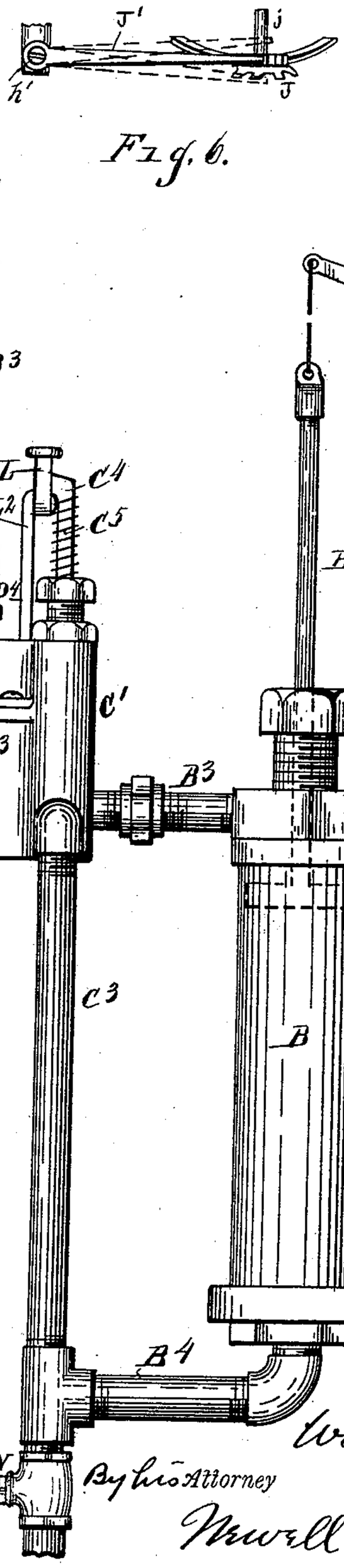


Fig. 3.

Fig. 5.

Fig. 6.



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CODE SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 541,505, dated June 25, 1895.

Application filed July 2, 1894. Serial No. 516,261. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM RYMER, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Code Signaling Devices; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object a code signaling device for various uses, as for a fog signal, for example, and it consists of the construction, combination and arrangement of devices hereinafter specified and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan and diagram view illustrating my invention. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a side elevation. Fig. 4 is a section on the line 4 4, Fig. 2. Fig. 5 is a detail view in perspective of one of the contact-plates. Fig. 6 is a view of such a plate in plan, showing also the contact-spring.

My signaling device is more particularly designed for use in connection with a steam or similar whistle, the signals to be given being controlled by electricity, to give the signals required by any given code, automatically, while at the same time the device may be operated by hand if desired.

Hitherto it has been considered a very desirable thing to accomplish, to provide means whereby a code of marine signals could be adopted and carried into effect, for example, by vessel men, by which boats approaching one another in a fog, could indicate in what direction they were steering. At present, in a fog the signals given in passing do not indicate in which direction a boat giving its signal may be going.

My invention is adapted among other uses to which it may be applied to enable a given code to be followed which shall indicate the direction of the course of any given vessel sounding a signal. By my improved device any code of signals by a steam or similar whistle can be sounded, as may be required.

I carry out my invention as follows:

A represents any steam whistle apparatus. A′ is the steam pipe leading to the whistle mechanism, and A^2 is the whistle controlling valve provided with an operating lever. This mechanism may be constructed in any ordinary manner.

To control the valve A^2, my invention contemplates the provision of a cylinder B provided with a piston, shown in dotted lines at B′ Fig. 3, the piston rod B^2 being connected with the operating lever of the valve A^2.

B^3 is a steam inlet pipe leading into the cylinder B above the piston, and B^4 is an exhaust pipe communicating with the base of said cylinder. It will be apparent that the movement of the piston B′ operates the whistle controlling valve A^2. To control the inlet of steam through the pipe B^3 into the cylinder B, I provide a differential piston C in a cylinder C′, the lower head "*c*" of the piston being of smaller dimensions than the upper head *c′*.

C^2 is a steam inlet pipe opening into the cylinder C′ between the heads of the differential piston, the pipe C^2 admitting steam at boiler pressure between said heads. Obviously the upper head being larger, the steam admitted through the pipe C^2 will exert an increased pressure upon the head *c′* over that exerted upon the head "*c*."

The heads of the piston C may be so differentiated as to provide for any desired increase of pressure upon the upper head. We will suppose, for example, that an increased pressure of five pounds is thus exerted upon the upper head.

C^3 is an exhaust pipe leading from the base of the cylinder C′ with which, for convenience, the exhaust pipe B^4 may communicate.

C^4 is the rod of the differential piston C. C^5 is a spring engaged therewith.

Adjacent to the differential piston C is a balanced piston D provided with piston heads "d_1" *d′*, d^2, of similar dimensions. The balanced piston is located in a cylinder D′. Steam at boiler pressure is lead into the balanced piston cylinder between its cylinder heads in any suitable manner as through an opening d^3 communicating with the cylinder C′ between the heads "*c*," *c′*, of the differential piston and with the cylinder D′ between the heads of the balanced piston. The two cylinders C′, D′, also communicate, as through

an orifice c^2 above the head c' of the differential piston, the orifice c^2 being controlled by the balanced piston D.

D^2 is an exhaust channel communicating with the top and bottom of the cylinder D′ and with the exhaust pipe C^3. A single jacket D^3 may inclose the cylinders C′, D′.

D^4 is the rod of the balanced piston D.

It will be perceived by reference more particularly to Fig. 4 that when the balanced piston D is raised, steam is admitted at boiler pressure through the orifice c^2 upon the top of the head c' of the differential piston, and that when the balanced piston is at its downward stroke, the steam is cut off from the top of the differential piston head c'. Obviously by letting the steam above the piston head c', the differential piston is caused to descend allowing the steam to pass through the pipe B^3 upon the top of the piston B to open the whistle valve. When the differential piston is raised, steam is cut off from passing through the pipe B^3 and the whistle valve is closed. The movement of the differential piston is thus governed by the movement of the balanced piston. To control the balanced piston, I connect the rod of the balanced piston with an armature E, controlled by an electrical magnet E′.

F denotes an electrical battery, and G and G′ the electrical conductors leading to and from the said battery, the conductor G leading directly to the magnet E′. G^2 is an additional electrical conductor leading to said magnet. The conductors G′ and G^2 are arranged to be thrown into and out of circuit the one with the other.

Into the circuit through the conductor G′, G^2, is interposed any suitable clock work, indicated in the diagram Fig. 1 at H, H′ indicating the frame of the clock work with which frame the conductors G′, G^2 are connected.

Supported upon the frame H′ is a contact plate J, made rotatable by the clock work as required. J′ is a spring arranged to contact with said plate. The frame is provided with a binding post "h" with which the spring J′ is adjustably engaged, the spring being held in position by means of a screw h', which may be provided with a spring h^2 to exert a proper tension upon the spring J′.

G^3 is an additional conductor in electrical contact with the spring J′ and leading to a switch board K governing the circuit through the conductors G′, G^3.

K′ is the switch lever.

The switch board may be provided with suitable contact points whereby the current may be either directed through the conductor G′ to the frame of the clock work, or through the conductor G^3 to the spring J′ in electrical contact with the contact plate J, or by which the clock work and the contact plate may be directly cut out of circuit, as indicated in the diagram Fig. 1. The clock work, with its contact plate J and contact spring J′, when in circuit is arranged to automatically govern the current leading to the magnet E′, and thereby automatically operate the armature E and, in consequence, the balanced piston D, thereby governing, as already explained, the whistle actuating valve. The contact plate J may be of any desired construction for sounding the signals required or a code of signals required. The contact plate might be made removable and interchangeable, so that a plate constructed to sound any desired code of signals may be engaged with the clock work.

In Fig. 5, a contact plate is shown provided with a journal "j" upon which the plate is rotated, the plate being formed with, for example, four contact arms j', j^2, j^3, j^4. These arms are offset one from another laterally, so that the spring J′ may contact with any one or more of said contact arms in the rotation of the plate J, while the spring J′ is made adjustable laterally so that it may be moved to contact with any arm or arms upon the plate J as may be desired. The outer edge of each of the contact arms may be made to rotate in a different plane if desired or any multiple of them in the same plane if desired. We will suppose for illustration, that the outer edges of each of the contact arms, shown in Fig. 5, rotates in a different plane. Then by setting the spring J′ to contact with any given arm in the rotation of the plate J, the circuit will be completed when the spring J′ contacts with the given contact arm, and the whistle mechanism will be actuated automatically in accordance therewith.

We will suppose that the plate J, shown in Fig. 5, makes a complete revolution each moment of time, and that the spring J′ is arranged to contact with the arm j'. Obviously, whenever the arm j' strikes the spring the electrical circuit will be completed, the armature actuated, and the whistle mechanism sounded once every moment. Should it be desired to sound the whistle every thirty seconds, two of the contact arms would be arranged to have their edges rotate in the same plane, and consequently the circuit would be completed every thirty seconds through the contact spring J′, and the whistle mechanism sounded accordingly. To sound a given code of signals, as many contact arms may be provided as may be required and each of the contact arms may be variously formed to suit the code of signals. Should it be required, for example, to sound four blasts of the whistle every moment, one of the arms, as the arm j^3, may be formed with four contact points, as illustrated in Fig. 5, so that whenever the arm j^3 rotates under the spring J′, four blasts of the whistle will be successively sounded every moment.

In Fig. 6, a contact plate of modified form is shown, each of the contact arms being provided with a series of contact points, and as the spring J′ is set to contact with one or the other of the contact arms, the signal will

be sounded accordingly. It will thus be seen that a contact plate may readily be formed, or interchangeable plates may be located upon the clock work to automatically sound any code of signals desired, and the contact plates may be changed readily to suit any given circumstances.

I have alluded above to the desirability of a code of signals to indicate the direction of the course of the vessels in passing one another. We will suppose a code to be established whereby upon such an occasion a single short blast of a whistle occurring a given number of times in a moment would indicate that a vessel was taking a northerly course; two short blasts occurring a given number of times in a moment, that a vessel was taking an easterly course; three short blasts occurring a given number of times in a moment, that the vessel was taking a southerly course; and four short blasts occurring a given number of times in a moment, that the vessel was taking a westerly course. Were such the case, a contact plate would be formed accordingly, and when a vessel was pursuing one course or another the officer would simply adjust the contact spring J′ to form the required contact. By means of the switch board K, the contact spring J′ may readily be cut out of circuit or the entire clock work be cut out of circuit, allowing the differential piston to be operated by hand, which for this purpose may be provided with an operating lever L and a pull-cord L′.

L^2 is a support for the extremity of the lever L.

I do not confine myself to the use of the differential piston, as a spring might be used to unbalance the piston.

In a device constructed as hereinbefore described, when the circuit is broken, the balanced valve will drop to its place; but I would have it understood that I may use the balanced valve either with a closed or open circuit.

If the device were worked by a closed circuit, the teeth of the contact plate would form a circuit breaker.

The balanced valve might be dispensed with and the armature E be engaged with the piston rod C^4 within the scope of my invention, but by using the balanced valve I am enabled to give to the piston C a longer stroke, and it would take more power to operate the piston C if the balance valve were not employed. By using the balanced valve I make the steam actuate the piston C, where otherwise sufficient electrical power would be required to operate the differential piston.

M denotes a spring engaging the armature E to retract the armature when the circuit is broken, and cause the balanced valve to fall to its normal position.

I prefer to locate in the exhaust pipe C^3 a valve N which may be partially closed to contract the exhaust passage and thereby force a desired amount of steam pressure under the piston B′ to aid in raising it quickly to its normal position.

It will be evident that the cylinder B on the up stroke of its piston exhausts through the pipe B^3 into the base of the cylinder C′ below the unbalanced valve therein, and thence through the pipe C^3.

What I claim as my invention is—

1. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a cylinder B and its piston to control the whistle valve, a cylinder C′ provided with an exhaust pipe C^3, a steam pipe B^3 connecting said cylinders, an electrically controlled piston in the cylinder C′ controlling the communication of the cylinders B, C′, through the pipe B^3, the cylinder B exhausting on the up stroke of its piston through the pipe B^3 and cylinder C′, substantially as set forth.

2. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a cylinder B and its piston to control the whistle valve, a cylinder C′ provided with an exhaust pipe C^3, a steam pipe B^3 connecting said cylinders, an electrically controlled piston in the cylinder C′ controlling the communication of the cylinders B and C′ through the pipe B^3, a pipe B^4 leading from the cylinder B at the end opposite the steam pipe B^3 into the exhaust pipe C^3, the cylinder B exhausting on the up stroke of its piston through the pipe B^3, cylinder C′, and pipe C^3, a portion of the exhaust steam entering the cylinder B below its piston to facilitate the up stroke thereof, substantially as set forth.

3. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a piston to control the whistle valve, an unbalanced piston to control the operation of the former piston, and a balanced valve to control the operation of the unbalanced piston, substantially as set forth.

4. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a cylinder B and its piston to control the whistle valve, a cylinder C′ communicating with the cylinder B and provided with a piston controlling said communication, a steam inlet pipe communicating with said cylinder C′ intermediate the ends of the piston, a cylinder D′ communicating with the cylinder C′ toward the upper and the lower end thereof and provided with a piston or valve controlling said latter communications, electrical conductors to operate said latter piston or valve, means to open and close the circuit through said conductors, and clock work in said circuit, said clock-work provided with a rotatable contact plate and a spring engageable with said plate, substantially as set forth.

5. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a cylinder B and its piston to control the whistle valve, a cylinder C′ communicating with the cylinder B and provided with a piston having differential heads con-

trolling said communication, a steam inlet pipe communicating with the cylinder C′ between the heads of its piston, a cylinder D′ communicating with the cylinder C′ toward the ends thereof and provided with a piston or valve controlling said latter communications, electrical conductors to operate said latter piston or valve, means to operate and close the circuit through said conductors and clock-work in said circuit, said clock-work provided with a rotatable contact plate and an adjustable spring engageable with said plate, substantially as set forth.

6. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a piston to control the whistle valve, an unbalanced piston to control the operation of the former piston, and an electrically controlled balanced valve or piston to control the operation of the unbalanced piston, substantially as set forth.

7. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a piston to control the whistle valve, a differential piston to control the operation of the former piston, and a balanced valve or piston to control the operation of the differential piston, substantially as set forth.

8. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, an electrically controlled piston to operate the whistle valve, a rotatable contact plate, and an adjustable contact spring located in the electrical circuit controlling said piston, said contact plate provided with arms offset from the body of the plate to rotate in different planes, substantially as set forth.

9. In a signaling device, the combination of a whistle mechanism provided with a controlling valve, a piston to operate the whistle valve, an unbalanced piston to control the operation of the first named piston, an additional piston or valve to control the unbalanced piston, an armature engaged with said additional piston or valve, a magnet controlling said armature, electrical conductors in circuit with said magnet, a spring to retract said additional piston or valve, a clock-work provided with a rotatable contact plate and a contact device located in the electrical circuit to contact with said plate, substantially as set forth.

10. In a signaling device, the combination of a whistle mechanism, a piston to operate the whistle, a cylinder engaging said piston, an additional cylinder communicable with the former cylinder, an additional piston located in the additional cylinder to control the first named piston, exhaust pipes leading from said cylinders and a valve located in the exhaust pipe whereby a desired pressure may be communicated beneath the first mentioned piston, substantially as and for the purpose described.

11. In a signaling device, a whistle mechanism, a piston B′ to control the whistle mechanism, an unbalanced piston C to control the piston B′, an electrically controlled balanced piston D to control the piston C, an operating lever engaged with the rod of the piston C, a rotatable contact plate and a contact spring located in the electrical circuit controlling the balanced valve, and a switch whereby the contact plate and spring may be thrown out of circuit, substantially as set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

WILLIAM RYMER.

Witnesses:
N. S WRIGHT,
O. B. BAENZIGER.