

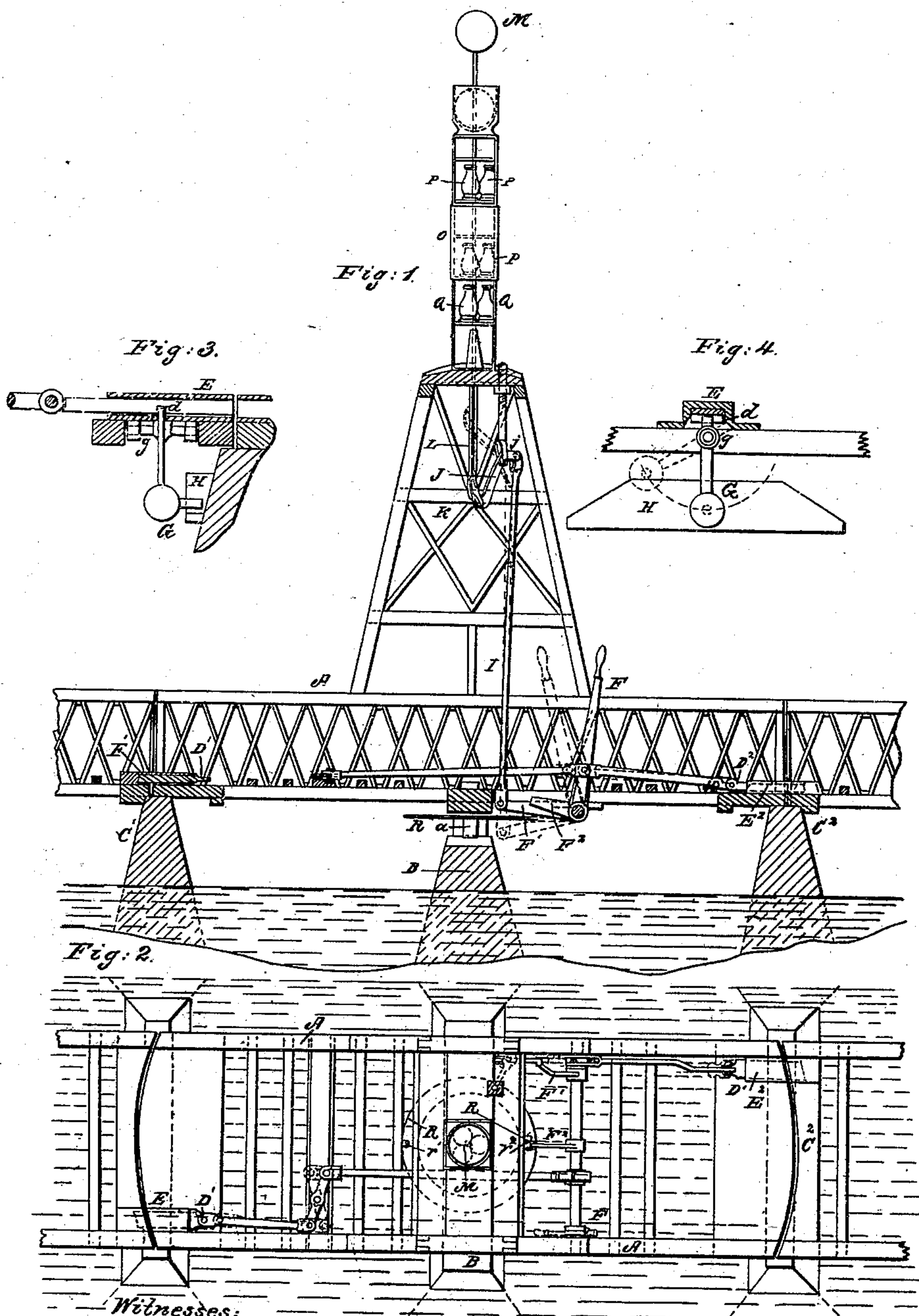
A. F. SMITH.

2 Sheets—Sheet 1.

Signal for Railroad Draw Bridge.

No. 58,492.

Patented Oct. 2, 1866.



Witnesses:
D. W. Nelson
D. L. Freeborn.

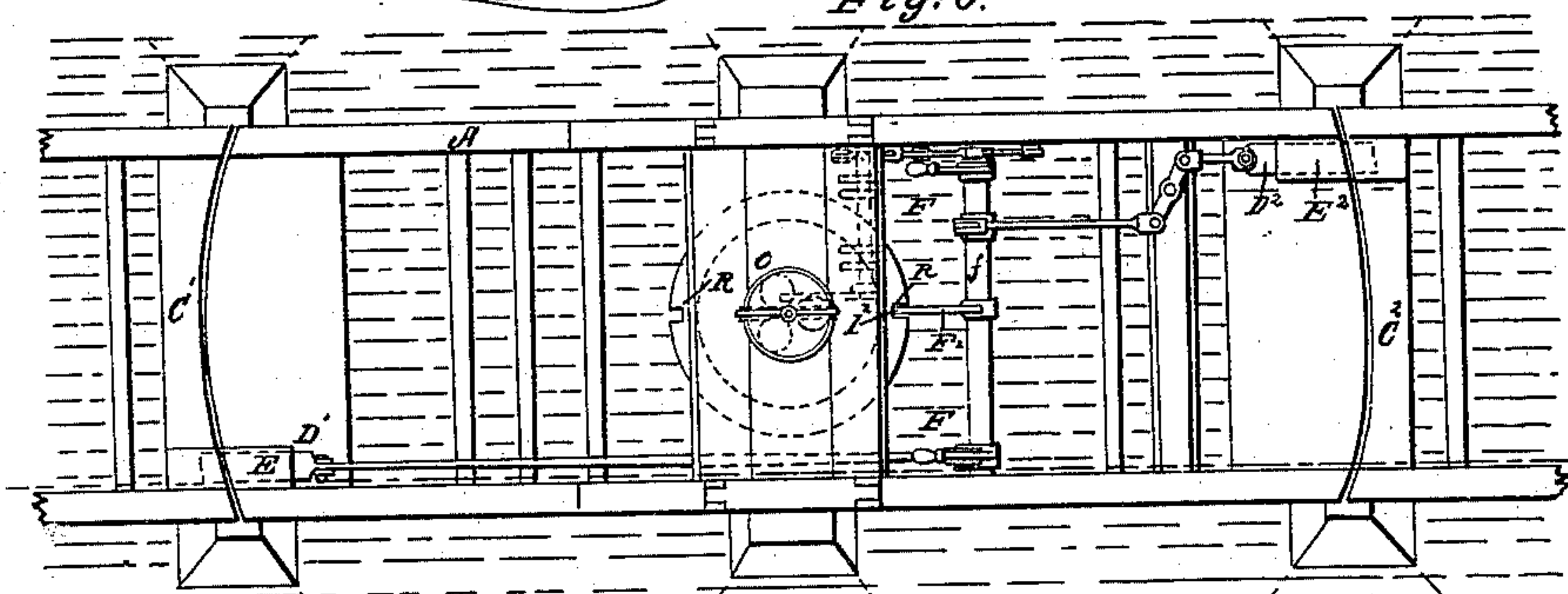
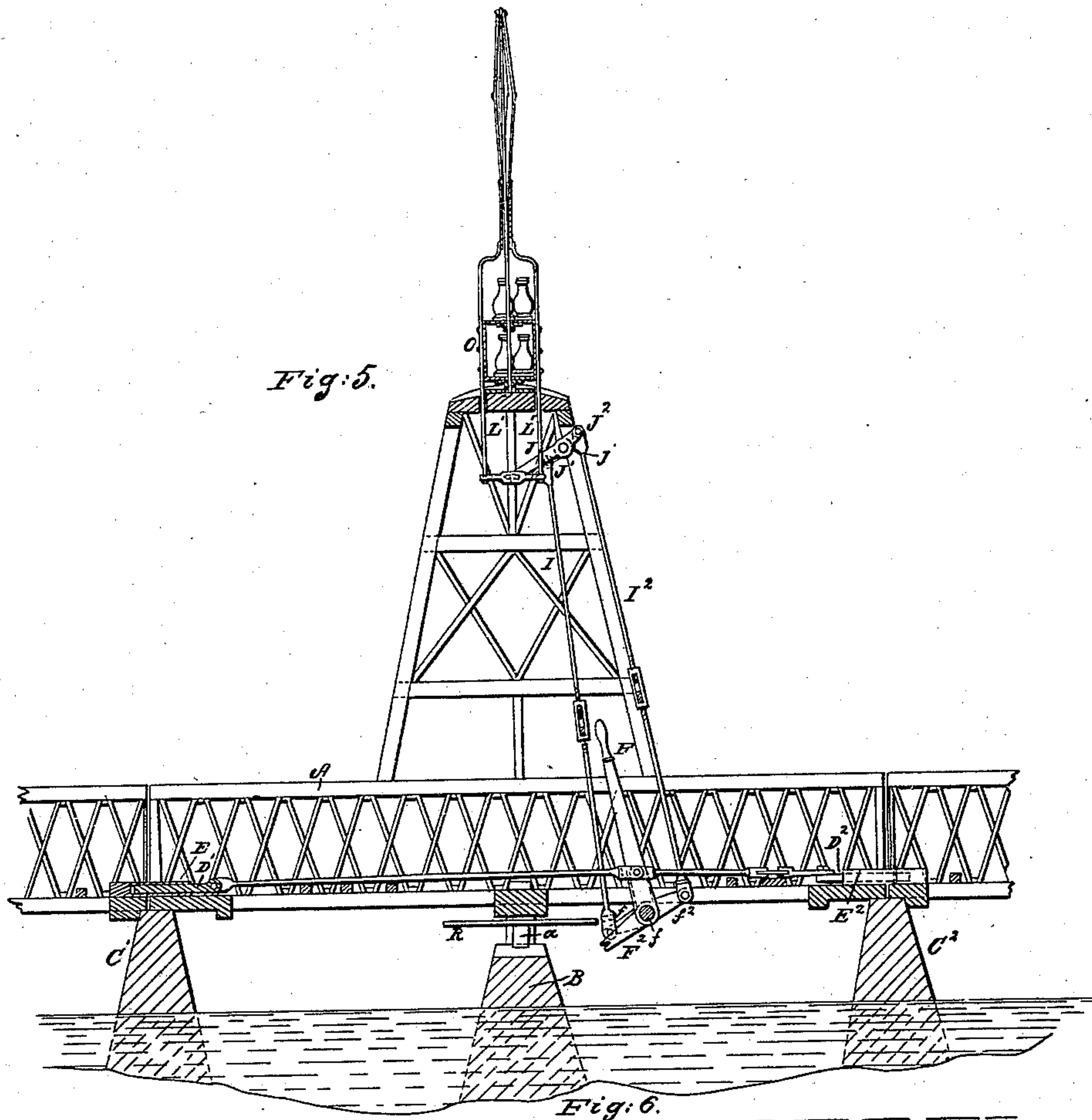
Inventor:
Alba F. Smith.

A. F. SMITH.

Signal for Railroad Draw Bridge.

No. 58,492.

Patented Oct. 2, 1866.



Witnesses:

D. W. Stetson.
D. L. Freckhorn.

Inventor:

Alba F. Smith.

UNITED STATES PATENT OFFICE.

ALBA F. SMITH, OF NORWICH, CONNECTICUT.

IMPROVED SIGNAL FOR RAILROAD DRAW-BRIDGES.

Specification forming part of Letters Patent No. 58,492, dated October 2, 1866.

To all whom it may concern:

Be it known that I, ALBA F. SMITH, superintendent of the Hudson River Railroad, residing at Norwich, county of New London, State of Connecticut, have invented certain new and useful Improvements in Draw-Bridges and Apparatus connected therewith; and I do hereby declare that the following is a full and exact description thereof.

My invention relates to the signals which indicate when the bridge is open, and which are relied on to avert most deplorable accidents.

In order to be absolutely certain that the signal shall be set before the draw is disturbed, I connect the locking mechanism, which operates the locking-bolts, with the mechanism which sets the signal, so that the signal is absolutely certain to be set to indicate danger before the bridge has commenced to move out of its proper line.

Draw-bridges are ordinarily secured and released by the aid of two bolts, which are simultaneously thrown out or retracted by the working of a lever or the like near the center of the bridge.

In order that the danger-signal be certainly set, it has been before proposed to connect the motion of the bridge by various mechanism with the signal, so that so soon as the bridge has commenced to open, whether by swinging around in the ordinary manner or by lifting, or by various combinations of both of these movements, the danger-signal shall be set, and shall be held in a condition distinctly indicating danger during the whole period that the bridge is open.

Such apparatus is defective, in not meeting the whole difficulty. It leaves a period between the unlocking of the bolt and the setting of the danger-signal, during which period, although the bridge cannot be wide open, so as to allow a train to plunge directly into the water, the leaving of the track, and possibly an equally destructive smash or an ultimate plunge through the side railing into the river, may result from the attempted passage of a train.

Another portion of my invention relates to means for preventing the danger-signal from being withdrawn while the bridge is open.

It may sometimes happen that from perturbation or a possible malicious feeling, or other cause, the attendant may change the signal after the bridge has been opened. My invention is intended to guard against the possibility of such evil.

I will describe what I consider the best means of carrying out my invention, and will afterward designate the points which I believe to be new.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation of the bridge with the locking mechanism, the danger-signals, and their connections. The black lines indicate the position when the draw is locked and the signals indicate safety. The red lines indicate the position when the draw is unlocked, and is ready to be moved, and the signals indicate danger. Fig. 2 is a plan view, representing the parts by black and red lines, as above described. The floor is omitted. Fig. 3 is an enlarged section of a portion, showing a modification of the means by which signals are locked in position when the bridge is open, so that they cannot be changed either by design or mistake. Fig. 4 is a corresponding section transverse of the bolt and its housing. These latter figures show the preferable mode of operating the locking device. Fig. 5 is a side elevation, representing a modification of the details, which may be employed with advantage in many instances. Fig. 6 is a plan view of the same. In these two latter figures the bridge is locked safely, and the signals indicate such fact.

Similar letters of reference indicate like parts in all figures. Tints are employed to aid in distinguishing parts, and do not indicate materials. The materials may be mainly iron.

A is a swiveling draw of the ordinary construction, and adapted to turn horizontally around the center *a* on the pier B. The support on which the draw turns may be provided with wheels, friction-rollers, or the like, according to any of the approved plans.

C' and C² are the fixed abutments or stationary parts of the bridge.

D' D² are sliding bolts, housed in the casings E' E² on the bridge, and adapted to be projected into recesses in the abutments C' C²,

and withdrawn therefrom, by the aid of connections with the hand-lever F, as will be obvious.

M is the day-signal, and is a red ball of such size as to be distinctly seen at great distances. There is a night-signal, composed of two red lanterns, P, and two white lanterns, Q, arranged one over the other, the red being uppermost.

R is a horizontal circle of metal mounted on the abutment B, and having two deep notches, r' r^2 , as represented.

F² is a forked lever raised and lowered by the hand-lever F, and standing in the plane of the notches r' r^2 , when the draw is in line of the track. In this position the lever F and its attachments may be operated freely, the forked end of the arm F² traversing freely up and down through the notch r' r^2 . When the bolts D' D² are withdrawn from the abutments C' C², so as to liberate the bridge, the forked lever F² is depressed to the level of the ring R. So soon as the draw commences to swing the arm F² is locked down by the circle or ring R, and is not liberated again until the draw is again exactly in line with the track. It follows that the danger-signal cannot be restored to its original position, so as to indicate safety, until the bridge is in an actually safe position.

Figs. 3 and 4 indicate an arrangement of the details for effecting this object without a necessity of constructing and maintaining a large circle or ring, R. In this modification there is a notch, d , in each of the sliding bolts described, and a weighted lever, G, hanging on a center, g , directly below it, so that when the weight is free to act, the lever G will stand in the notch d , and prevent the bolt from being thrown out. It will, of course, be obvious that the danger-signal cannot be withdrawn while my mechanism remains complete without at the same time throwing out the bolts D' D².

The weighted lever G, by standing in the notches d all the time that the draw is open, prevents the possibility of throwing out these bolts. When the bridge is restored to its safe position the weighted ends of the levers G strike against an inclined stop, H, mounted on each abutment, and are thereby lifted and swung to one side. This movement carries the upper end of the weighted levers G out of the notch d , and leaves my bolts free to be thrust out; and, consequently, the danger-signal is then withdrawn. So soon as the bridge is again unlocked, and the draw commences to move in either direction, the weighted lever G leaves the stop H, and its gravity causes its short end to again enter the notch d , and to hold the signal and all the connecting parts firmly locked or secured.

The parts which connect my operating lever F with the danger-signal will be readily understood from the figures.

F' is a lever keyed on the shaft f , which is turned by the hand-lever F. I is a rod lead-

ing up from the end of the lever F' to the short end of the lever J, which is supported on the fulcrum j . K is a connection from the longer end of the lever J to the lower end of the operating rod or frame L, which supports the night and day danger-signals, and is capable of moving up and down to a sufficient extent to change the signals, as will be readily understood by those familiar with railroad practice and with draw-bridge engineering.

When the bolts D' D² are withdrawn from the abutments C' C², so as to liberate the draw, the same act depresses the lever F² and the rod I, and elevates the connection K and the frame L and its attachments.

When the frame L is in its lowest position the day-signal M is concealed in the casing prepared for it, as indicated by the dotted lines, and the night danger-signals—two red lanterns, P P—are concealed within the casing O, while the night safety-signals, composed of two ordinary white lanterns, Q Q, are exposed below the casing O, and are distinctly visible at a great distance.

When the draw is unlocked and the frame L is elevated, as indicated by red lines, the day-signal M is distinctly exposed, as is also the night danger-signals P P, which are then elevated above the casing O, while the night safety-signals Q Q are concealed within the casing.

In Figs. 5 and 6 the day-signal, instead of being a ball rising out of the casing (in which it has been concealed) to indicate danger, is an expanding frame covered with scarlet fabric and adapted to expand like an umbrella when it is desired to exhibit the danger-signal. While the bridge is safe the signal is collapsed. When the draw is unlocked the signal is expanded, and is distinctly visible at a great distance. The lanterns in this arrangement are fixed, and the casing which conceals one or the other is movable.

Lights are arranged one above the other, the white light being uppermost, and the red light or the white light is exhibited, according as the bridge is in a condition of danger or safety.

The locking device is substantially as before described. Either of the modifications described in the preceeding figures, or many others, which may be constructed by any good mechanic, may be applied for preventing the signals being disturbed while the draw is open.

In this mode of connecting the signals there never need be a thrusting strain on the long and slender connection, the lever J overhead being operated by two tension-rods, I' I², with turn-buckles for adjusting their length with accuracy, and connected to two arms, J' J², on the shaft j of the upper lever, J, and to two arms, f' f^2 , on the shaft f to the lower lever.

It will be understood that in this arrangement the casing O is carried on the framing L', and is raised and lowered by the lever J.

For closing the passage-way when the draw is turned, I propose to connect my bolts D' D²

by connecting mechanism to suitable gates, so that the gates shall be opened by the locking of the draw, and be closed by the unlocking of the draw.

I have not deemed it necessary to represent all the details of the mechanism for this purpose, as they may be easily constructed in many forms by any good mechanic. One of the most obvious methods is to connect a lever so that it shall be operated by the turning of the bolt D' or D^2 , and thus throw open the gate when the bolt is thrown out to secure the draw, and to provide a weight or spring of sufficient force to return the lever and the gate to its place, so as to shut the gate as the bolt is withdrawn and the draw liberated.

I can provide for setting the danger-signal in advance of the movement of the locking-bolt by making a slotted connection or an equivalent sleeve at some point, and providing independent connection between the signals and the bridge. This will allow the danger-signal to be set before the lever F is moved, but will allow my invention, before described, to be serviceable in insuring the proper setting of the signals, by making it absolutely certain that the danger-signal shall be set by the act of unlocking the bridge, when it has not been previously done.

I have not deemed it necessary to represent any device for this purpose, as such may be readily constructed by any good mechanic. I

prefer not to introduce any such arrangement, but to make the connection direct and simple, and to employ signals set by hand, entirely independent of the main signal, to indicate in advance an intention to unlock and open the draw.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. In draw-bridges, mechanically connecting the locking devices D' D^2 with the danger signal or signals, so that the draw cannot be liberated without the danger-signal being properly set in advance of the commencement of the movement of the draw from the safe position, and the safety-signal cannot be shown until the bridge is locked in the safe position, all substantially as and for the purpose herein set forth.

2. In combination with the above, so connecting the night and day signals that both shall be operated at the same time.

3. In combination with the above, the locking of the signals by means F^2 R r' r^2 , or their equivalents, so as to necessarily continue to indicate danger during the whole period that the draw is out of the safe position, substantially as and for the purpose herein specified.

ALBA F. SMITH.

Witnesses:

D. W. STETSON,

D. L. FREEBORN.