

1,154,162.

Fig. 1.

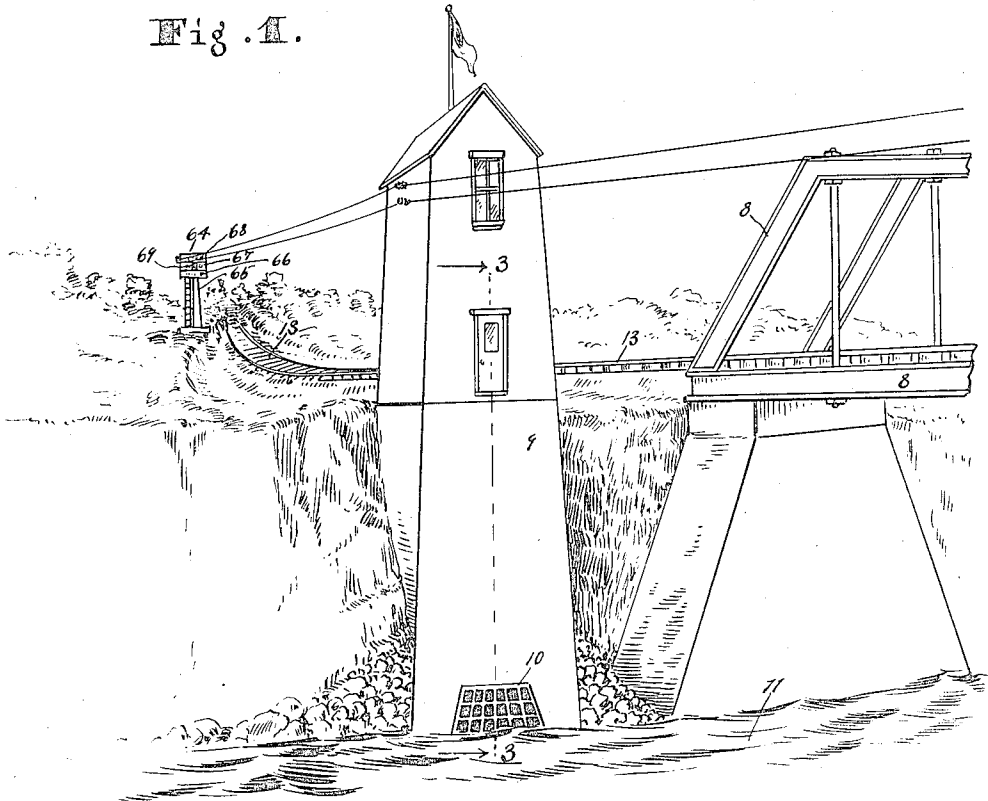
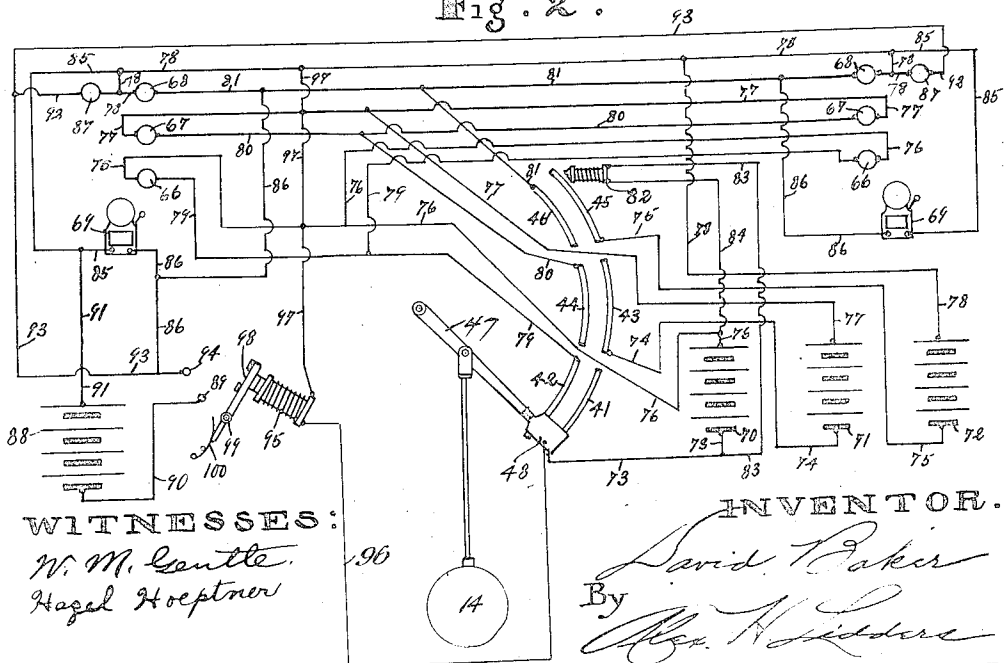


Fig. 2.



WITNESSES:
W. M. Gentile
Hazel Hoeptner

INVENTOR.
David Baker
 By *W. H. Reddick*
 ATTORNEY.

1,154,162.

Fig. 3.

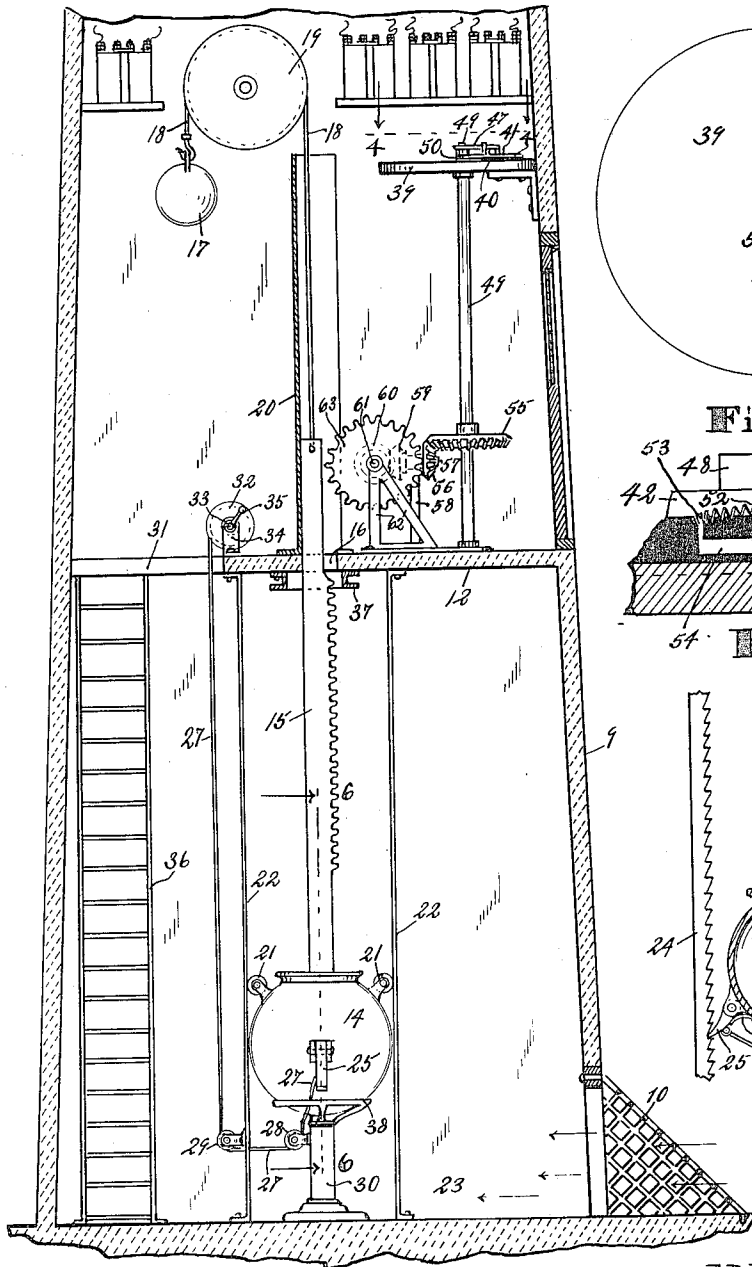


Fig. 4.

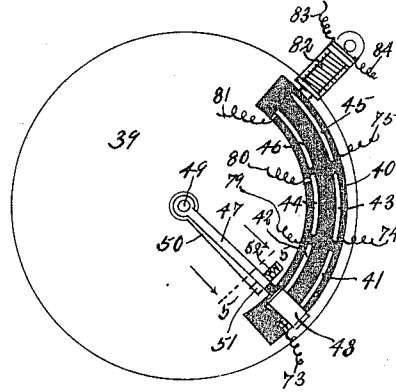


Fig. 5.

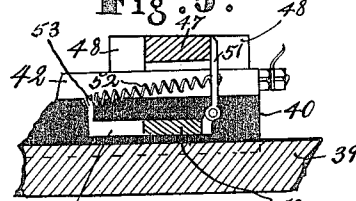
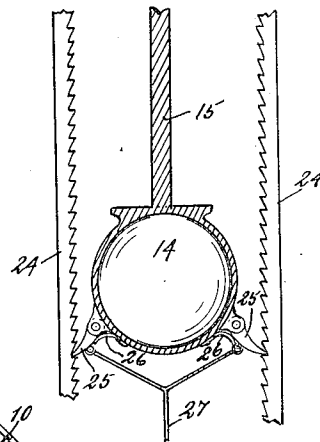


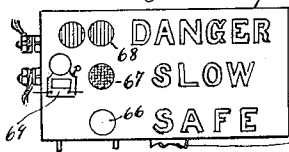
Fig. 6.



WITNESSES:

W. M. Gentle
Hazel Hoeptner

Fig. 7.



INVENTOR.

David Baker
By
ATTORNEY.

UNITED STATES PATENT OFFICE.

DAVID BAKER, OF LOS ANGELES, CALIFORNIA.

SIGNAL APPARATUS.

1,154,162.

Specification of Letters Patent.

Patented Sept. 21, 1915.

Application filed July 16, 1914. Serial No. 851,416.

To all whom it may concern:

Be it known that I, DAVID BAKER, a citizen of the United States of America, residing at Los Angeles, county of Los Angeles, State of California, have invented a certain new and useful Signal Apparatus; and I do hereby 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.

This invention relates to signal apparatus, and it may be said to consist in the provision of the novel and advantageous features and in the novel and improved construction, arrangement, and combination of parts and devices as will be apparent from the description and claims which follow hereinafter.

The main object of the invention is to provide novel and improved railway signal apparatus which is adapted to be installed adjacent to a bridge over a water course to indicate different heights of the water and its probable effect on the safe condition of the bridge.

Another object of the invention is to provide novel and improved railway signal apparatus in which a warning signal is connected with an auxiliary battery and with means whereby it is adapted to operate when the other signals fail to operate for want of current.

A further object of the invention is to provide novel and improved signal apparatus in which the float is automatically held in raised position, and in which the contact arm is held when the rise of water renders the bridge unsafe; said contact arm being operatively connected with the float to permit the latter to continue to rise without moving it further.

Further objects of the invention are to provide apparatus of the nature specified which is simple, automatic in operation, economical to install and maintain, and effective in action.

Other objects and the advantages of the invention will be apparent from a careful consideration of the following description of the preferred form of the apparatus embodying it, taken in connection with the accompanying drawings in which—

Figure 1 is a broken view showing the apparatus in use adjacent to a railway bridge; Fig. 2 is a diagrammatic view of the devices and electrical connections; Fig. 3 is an en-

larged broken longitudinal sectional view of the housing and mechanism therein; Fig. 4 is an enlarged plan view of a portion of the mechanism, taken on the line 4—4 of Fig. 3; Fig. 5 is an enlarged broken sectional view taken on the line 5—5 of Fig. 4; Fig. 6 is a longitudinal sectional view taken on the line 6—6 of Fig. 3; and Fig. 7 is an enlarged view of the signal board.

Adjacent to the railway bridge 8 over a water course is disposed a suitable housing 9 which is provided with a preferably screen-covered opening 10 at its lower end for the entrance of water from the stream 11. Within the housing 9 is a platform 12 which is substantially at the same level as the railway 13. A float 14 is disposed under the platform 12 and has thereon a rack bar 15 which passes through an opening 16 in the platform 12 and against a guideway 20 on the platform and is preferably connected with a counterweight 17 by means of a cable 18 which passes over a sheave 19 suitably mounted above the platform 12. The float 14 may have thereon the rollers 21 which are adapted to move in contact with the guide bars 22 which are preferably secured to the platform 12 and to the floor 23 of the housing 9. Any suitable means for holding the float 14 in raised position may be employed; that shown consisting of the ratchet bars 24, and the pawls 25 which are pivotally mounted on the float and pressed into engagement with the bars 24 by springs 26. The pawls 25 may be disengaged from the bars 24 by means of a cable 27 which is attached to the pawls and passes over sheaves 28 and 29 on the stand 30 and one of the guides 22 and thence passes through the opening 31 in the platform 12 and thence around the reel 32 the shaft 33 of which bears in standards 34 on the platform and may be operated by the crank 35. A ladder 36 may extend from the opening 31 to the floor 23. The upward movement of the float 14 may be limited by the stop 37 on the underside of the platform 12, and the downward movement of said float may be limited by the stop 38 on the stand 30.

Above the platform 12 in the housing 9 is suitably mounted a shelf 39 having thereon an insulating block 40 on which is disposed the spaced pairs of contact bars 41 and 42, 43 and 44, and 45 and 46. An arm 47 has one end portion thereof provided with contact piece 48 adapted to move on,

and bridge the space between adjacent ends of, the pairs of contact bars successively. The other end portion of the arm 47 is pivotally mounted on a shaft 49 on which is secured one end of an arm 50 which has on its free end a pivoted finger 51 which latter is held against the arm 47 by a spring 52 which is secured to the finger 51 and to a projection 53 on the side extension 54 on the arm 50.

The shaft 49 may be operatively connected with the rack bar 15 by the bevel wheel 55 which is mounted on the shaft 49 and in mesh with the bevel pinion 56 on one end of a shaft 57 which is mounted on the standard 58 on the platform 12 and has on its other end a bevel pinion 59 in mesh with a bevel pinion 60 which latter is mounted on shaft 61 bearing in pillow block 62 on the platform 12 and has also mounted thereon the spur wheel 63 with whose teeth the teeth of the rack bar 15 are adapted to coact.

At a suitable distance from the housing 9 is disposed the signal board or box 64 which is preferably arranged on a stand 65 and has thereon suitable visual signals 66, 67, 68, preferably electrically lighted, to indicate the condition of the stream and hence of the bridge 8. An audible signal 69 may also be mounted on the signal board 64. The visual signal 66 may be white in color and indicate safe condition, and the visual signals 67 and 68 may be yellow and red, respectively, to indicate caution and unsafe condition of the bridge. The audible signal 69 may consist of a bell or gong. A signal board 64 is preferably arranged at both ends of the bridge.

One pole of the batteries 70, 71, 72, or other suitable source of current supply, is connected to the contact bars 41, 43, and 45, respectively by conductors 73, 74 and 75. The other pole of said batteries is connected to the electric lamps of the visual signals 66, 67, and 68 by conductors 76, 77 and 78 respectively, and conductors 79, 80, and 81 connect said electric lamps to the contact bars 42, 44, and 46 respectively. An electromagnet 82 is connected to one pole of the battery 70 by conductors 73 and 83, and to the other pole of said battery by conductors 76 and 84, and is adapted to hold the arm 47 on the contact bars 45 and 46 to maintain the circuit through the danger signal once such circuit is closed. The audible signal 69 is connected to the conductors 78 and 81 by conductors 85 and 86 respectively.

A warning signal 87 is disposed on the signal board 64 and is normally in open circuit arrangement with the visual signals 66, 67 and 68, and with the battery or other suitable source of current supply 88. The battery 88 has one pole thereof connected to the contact 89 by conductor 90, and has

the other pole thereof connected to the warning signal 87 by conductors 91, 85, and 78. Conductors 92 and 93 connect the warning signal 87 to the contact 94. An electromagnetic switch has the magnet 95 thereof connected by conductor 96 to the contact piece 48, and by conductor 97 to the conductors 76, 77, and 78, and it has the switch 98 thereof mounted on a pivot 99 and adapted to be moved by a spring 100 to bridge the contacts 89 and 94 and thereby close the circuit through the warning signal 87.

From the foregoing the mode of operation and the advantages of the invention will be readily understood by those skilled in the art. It will be seen that the apparatus is well suited for use where bridges cross small water courses which are liable to flood or overflow conditions such as might weaken or wash away the bridge. It will be apparent that as the stream 11 rises the float 14 is raised and the arm 47—by the operative connections with the float—is moved to have the contact piece 48 successively bridge the contact bars 41 and 42, 43 and 44, and 45 and 46. While the contact pieces 48 bridges the contact bars 41 and 42, the signal 66 is operated by current from battery 70, through conductor 73, contact bar 41, contact piece 48, contact bar 42, and thence through conductor 79 leading to the signal 66, and through conductor 76 leading from the signal 66 to the battery 70. While the contact piece 48 bridges the contact bars 43 and 44, the signal 67 is operated by current from battery 71, through conductor 74, contact bar 43, contact piece 48, contact bar 44, and thence through conductor 80 leading to the signal 67, and through conductor 77 leading from the signal 67 to the battery 71. While the contact piece 48 bridges the contact bars 45 and 46, the signal 68 is operated by current from battery 72, through conductor 75, contact bar 45, contact piece 48, contact bar 46, and thence through conductor 81 leading to the signal 68, and through conductor 78 leading from the signal 68 to the battery 72. It will be obvious that if desired a single battery or suitable source of current may be used instead of the batteries 70, 71, and 72. When the contact piece 48 has moved on the contact bars 45 and 46, it is held to maintain current flow through the danger signal 68—by the electromagnet 82 which is energized by current which passes through conductors 73 and 83 leading from the battery 70 and through conductors 84 and 76 leading from the electromagnet 82 to the battery 70. While either of the signals 66, 67, and 68 are being operated the switch 98 is held by the electromagnet 95 which is energized by current which passes through conductor 96 connected to the contact piece 48, and through conductor 97 connected to the conductors 76, 77,

and 78. If at any time there is a failure of current for operating either of the signals 66, 67, and 68, the electromagnet 95 becomes deenergized and the switch 98 is moved by the spring 100 to bridge the contacts 89 and 94 and current is thereupon supplied to the warning signal 87 by the battery 88, said current passing from the battery 88 through conductor 90, contact 89, switch 98, contact 94, conductors 93 and 92 to the signal 87, and through conductors 78, 85, and 91 from the signal 87 to the battery 88. When the danger signal 68 is operated, the audible signal 69 is operated by current which passes through the conductor 86 which is connected to the conductor 81, and the conductor 85 which is connected to the conductor 78; and when the warning signal 87 is operated, the audible signal 69 is operated by current which passes through conductor 86 which is connected to conductor 93, and the conductor 91 which is connected to the conductor 85. When the arm 47 is held by the electromagnet 82, the spring 52 yields to allow the finger 51 and arm 50 to pass under the arm 47 in case the float rises further.

The form of the apparatus which has been particularly described and illustrated admits of many minor changes and modifications—wherefore the right is reserved to all such changes and modifications as do not depart from the spirit and scope of the invention which is defined in the appended claims.

I claim:

1. Signal apparatus including a float, spaced pairs of contact bars, a contact piece adapted to bridge the contact bars, operative connections between said float and said contact piece, signals, means for supplying electric current, conductors between said means and one of each of the pairs of contact bars, conductors leading from the other one of each of the pairs of contact bars to the signals, conductors leading from the signals to said means, a second means for supplying electric current, a warning signal, contacts, a conductor connecting the second means and one of the contacts, a conductor connecting the other of the contacts and the warning signal, a conductor connecting the second means and the warning signal, a spring-pressed switch adapted to bridge the contacts, an electromagnet adapted to hold the switch away from the contacts, and conductors connecting the electromagnet to the contact piece and to the conductors leading from the first mentioned signals.

2. Signal apparatus including a float, spaced pairs of contact bars, a contact piece adapted to bridge the contact bars, operative connections between said float and said contact piece, signals, means for supplying electric current, conductors between said means and one of each of the pairs of contact bars, conductors leading from the other one of

each of the pairs of contact bars to the signals, conductors leading from the signals to said means, a second means for supplying electric current, a warning signal, contacts, a conductor connecting the second means and one of the contacts, a conductor connecting the other of the contacts and the warning signal, a conductor connecting the second means and the warning signal, a spring-pressed switch adapted to bridge the contacts, an electromagnet adapted to hold the switch away from the contacts, conductors connecting the electromagnet to the contact piece and to the conductors leading from the first mentioned signals, rack bars, spring-pressed pawls on the float adapted to engage the rack bars to hold the float in raised position, and means connected with the pawls to move the pawls out of engagement with the rack bars.

3. Signal apparatus including a float, spaced pairs of contact bars, a contact piece adapted to bridge the contact bars, operative connections between said float and said contact piece, signals, means for supplying electric current, conductors between said means and one of each of the pairs of contact bars, conductors leading from the other one of each of the pairs of contact bars to the signals, conductors leading from the signals to said means, a second means for supplying electric current, a warning signal, contacts, a conductor connecting the second means and one of the contacts, a conductor connecting the other of the contacts and the warning signal, a conductor connecting the second means and the warning signal, a spring-pressed switch adapted to bridge the contacts, an electromagnet adapted to hold the switch away from the contacts, conductors connecting the electromagnet to the contact piece and to the conductors leading from the first mentioned signals, an audible signal, conductors connecting the audible signal to the conductors leading to and from one of the first mentioned signals, and conductors connecting the audible signal to the conductors leading to and from the warning signal.

4. Signal apparatus including a float, means for holding the float when it is raised in position, spaced pairs of contact bars, a shaft, an arm mounted loose on the shaft and provided with a contact piece adapted to bridge the contact bars, operative connections between the shaft and the float, a second arm secured to the shaft, a pivotally mounted finger on the second arm, a spring for holding the finger against the first mentioned arm, means to limit the movement of the first mentioned arm, signals, means for supplying electric current, conductors between said means and one of each of the pairs of contact bars, conductors leading from the other one of such of the pairs of contact

bars to the signals, conductors leading from
the signals to said means, a second means for
supplying electric current, a warning signal,
contacts, a conductor connecting the second
5 means and one of the contacts, a conductor
connecting the other of the contacts and the
warning signal, a conductor connecting the
second means and the warning signal, a
spring-pressed switch adapted to bridge the
10 contacts, an electromagnet adapted to hold
the switch away from the contacts, and con-
ductors connecting the electromagnet to the

contact piece and to the conductors leading
from the first mentioned signals.

In testimony whereof, I have signed my 15
name to this specification in the presence of
two subscribing witnesses at Los Angeles,
county of Los Angeles, State of California,
this 6th day of July, A. D. 1914.

DAVID BAKER.

Witnesses:

A. H. LIDDERS,
ELLA SCOTT.