

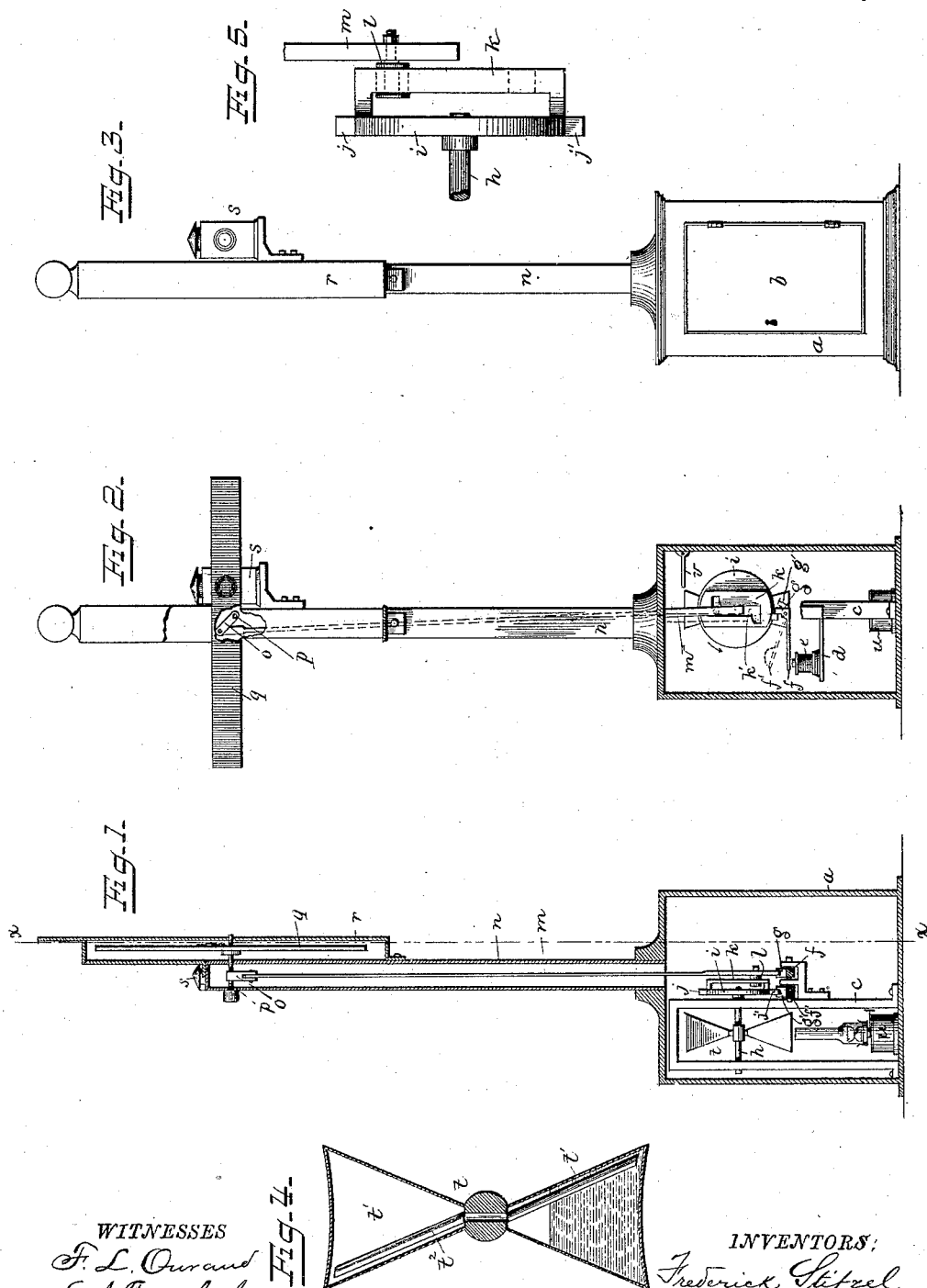
(No Model.)

F. STITZEL & C. WEINEDEL.

SEMAPHORE.

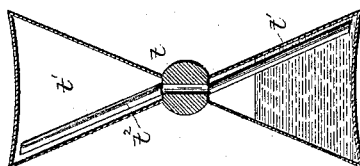
No. 344,755.

Patented June 29, 1886.



WITNESSES
F. L. Ourand
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Fig. 4-



INVENTORS:
Frederick Stitzel,
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UNITED STATES PATENT OFFICE.

FREDERICK STITZEL AND CHARLES WEINEDEL, OF LOUISVILLE, KENTUCKY,
ASSIGNORS OF TWO-THIRDS TO J. HENRY ECKELHOFF, OTTO MUELLER,
ADOLPH REUTLINGER, AND MOSES SCHWARTZ, ALL OF SAME PLACE.

SEMAPHORE.

SPECIFICATION forming part of Letters Patent No. 344,755, dated June 29, 1886.

Application filed April 18, 1885. Serial No. 162,620. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK STITZEL and CHARLES WEINEDEL, citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented a certain new and useful Improvement in Semaphores, of which the following is a full, clear, and exact description.

This invention relates to semaphores, for use more especially in connection with the block system of railway signaling; and it consists in means for operating the usual device used to express "danger" and "safety," as we will now proceed to specify and claim.

In the accompanying drawings, illustrating our invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation with the casing in section. Fig. 2 is a front elevation with the casing in section in the plane of line *xx*, Fig. 1. Fig. 3 is a front elevation. Fig. 4 is a cross-section of the power device; and Fig. 5, a side elevation, in detail, of the signal-rod-operating cam, the last two views being on a larger scale. The casing *a*, of suitable construction, and is provided with a properly-guarded door, *b*, for admitting of access thereto.

For convenience the signal-operating mechanism is arranged upon a frame, *c*, adapted to be secured within the casing *a*. Upon a bracket, *d*, secured to said frame, are arranged two electro-magnets, *e*, side by side, each having an armature-lever, *f f'*, (for the two see Fig. 1,) and said levers have stops or projections *g g'*, respectively, at their pivotal ends.

h is a shaft supported in the frame, and carrying on its end, outside the frame, a disk, *i*, having diametrically-opposite teeth or lugs *j j'* in line with the stop or projection *g'*. Upon the face of this disk is arranged a raised plate, *k*, having a Σ -shaped slot, *k'*. This slot *k'* receives a roller, *l*, near the end of the rod *m*, which last extends out of the casing vertically up into a tubular extension, *n*, of the casing, and is connected with the visual signal, as hereinafter described. The roller *l* is arranged at such a point upon the rod *m* as that when

said roller is in the lowermost angle of the slot the end of said rod will project below the disk *i* in line with and so as to engage the stop or projection *g* of the armature-lever *f*. The rod *m* is connected to a crank, *o*, fast on the shaft *p*, which last has bearings in the tubular extension *n* of the casing, and said shaft *p* carries at its outer end the visual signal *q*, of approved construction. The signal *q* is arranged to work in a shield, *r*, on the post or extension *n*, and in connection therewith, for night signaling, is used the lantern *s*. The signal *q* is counterbalanced to overcome the weight of the rod *m*, so as to assist in its operation.

The shaft *h* has secured rigidly to it a power apparatus, *t*, which in this instance works upon the principle of Franklin's pulse-glass, and consists of chambers *t' t'*, connected in pairs by a tube, *t''*, so that when heat is applied to the lower chamber the liquid (a readily-volatilized one, such as chloroform or ether) will rise through said tube into the other chamber, and gravity will act to invert the chambers and rotate the shaft *h* and its affixed disk *i*.

A lamp, *u*, may be provided as the source of heat, and the products of combustion escape into the tubular extension *n* of the casing and keep the moisture within it from freezing upon and so rendering the parts inoperative, thus insuring the working of the signal in cold weather.

The shaft *p* may be made hollow to serve as an outlet for the products of combustion, or other exit may be provided.

The electrical apparatus is of approved construction, and the use of the particular form of power herein shown is optional, but both form essential elements in our semaphore.

The operation is as follows: In Figs. 1 and 3 the signal denotes "safety," and in Fig. 2 it is in the "danger" position. In the position of "safety" the rod *m* is in its lowest position in the notched slot *k'* of the disk *i*, and is held there by its engagement with the stop *g* of armature-lever *f*, which latter is attracted by the electrified magnet *e*, the other magnet be-

ing inoperative, and its armature being free to be moved away from it by contact of the lug j or j' of the disk i with the projection g' of the said armature-lever f' . If a train now enters the "block" the electric current will be shifted to the other magnet e , which will attract and hold its armature-lever f' , and the armature-lever f will be released. The counterbalanced end of the signal q is now free to fall into the position of "danger," and in so doing, being heavier than the rod m , it draws the said rod m out of the angle of the slot k' up into the position of Fig. 2, the said angle at each end being inclined, as shown in Fig. 2, to assist in this operation. While the train is in the block the liquid in the lowermost chamber, t , will, under the action of the heat of the lamp, ascend into the upper chamber; but one of the lugs j or j' engaging the stop g' of the lever f' , the motor and disk will be held from rotating until, the train leaving the block, the electric current will be shifted back to the first magnet, whereby the armature-lever f' will be released and the lever f attracted, so that the power apparatus, being now top-heavy, will rotate the shaft h , turn the disk, and force the lever f' into the dotted-line position, Fig. 2, to allow the tooth or lug j or j' to pass it, thereby drawing the roller l into the now descending upper angle of the Σ -shaped slot, and drawing the rod m down to its lowest position, and so turning the signal into its shield to denote "safety." The armature-lever f' is weighted (see dotted lines, Fig. 2) sufficiently to overbalance the power apparatus until a sufficient quantity of liquid has entered the upper chamber to overbalance and carry down the rod and signal, should the magnet release said armature prematurely. When denoting "safety," the lower projecting end of the rod m

is in contact with the stop g of the electrically-held lever f , and its roller is in the lower angle of the slot k , and when said lever is released said end of the rod trips said lever and passes beyond it as it (the said rod) slips upward in the slot in the disk. The motor apparatus is large enough to contain such a weight of liquid in one chamber as that in dropping from the uppermost position in making an eighth of a revolution it will overcome the weight of the signal, and in the further revolution pull the signal into a vertical position. The power apparatus is held against reverse motion by a stop, v , on the casing.

What we claim is—

1. A visual signal, combined with a motor or power actuated by a vaporizable liquid inclosed therein and driven by heat from one chamber to another, substantially as described.
2. A visual signal, combined with a motor or power actuated by a vaporizable liquid inclosed therein and driven by heat from one chamber to another and an electrical apparatus for controlling the movement of said motor or power, substantially as described.
3. A visual signal and a motor or power actuated by a vaporizable liquid inclosed therein and driven by heat from one chamber to another, combined with a slotted plate or disk on the shaft of said motor, a rod extending from said disk to the signal, and an electrical apparatus for controlling the operation of the parts, substantially as described.

In testimony whereof we have hereunto set our hands this 16th day of April, A. D. 1885.

FREDERICK STITZEL.
CHARLES WEINEDEL.

Witnesses:

ALBEN REUTLINGER,
I. B. OHLIGSCHLOGER.

It is hereby certified that in Letters Patent No. 344,755, granted June 29, 1886, upon the application of Frederick Stitzel and Charles Weinedel, of Louisville, Kentucky, for an improvement in "Semaphores," errors appear in the printed specification requiring correction, as follows: In line 12, page 1, the word "usual" should read *visual*; and the character used in line 42, page 1, and line 30, page 2, to indicate the shape of the slot, should be formed thus \lrcorner ; and that the Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 6th day of July, A. D. 1886.

[SEAL.]

D. L. HAWKINS,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.