

(No Model.)

J. SPEIRS.
AUDIBLE SIGNAL.

No. 372,240.

Patented Oct. 25, 1887.



Fig. 2.

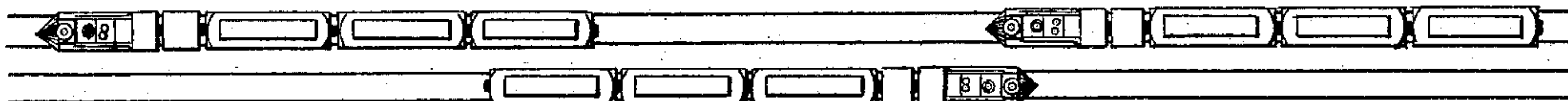


Fig. 3.

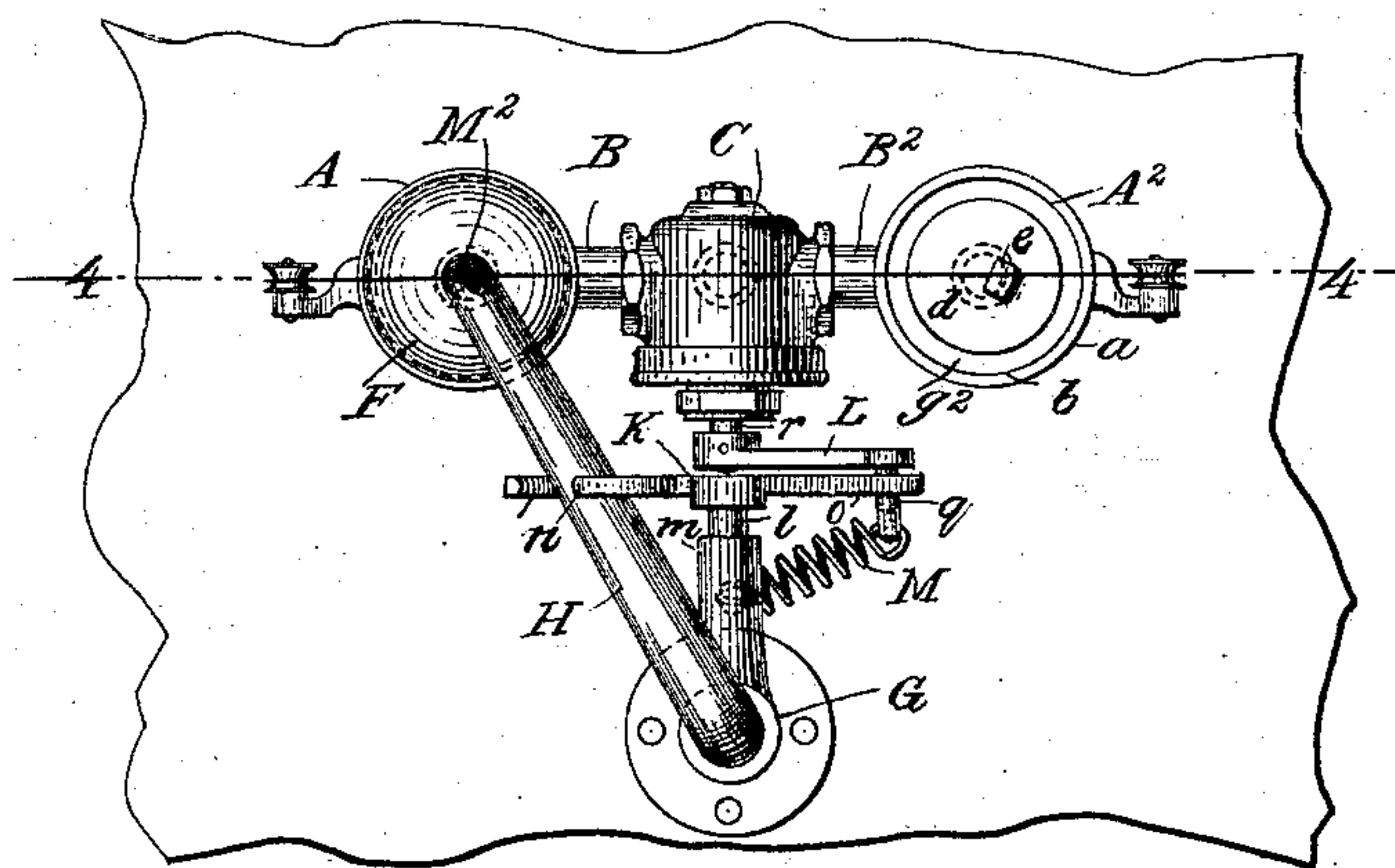
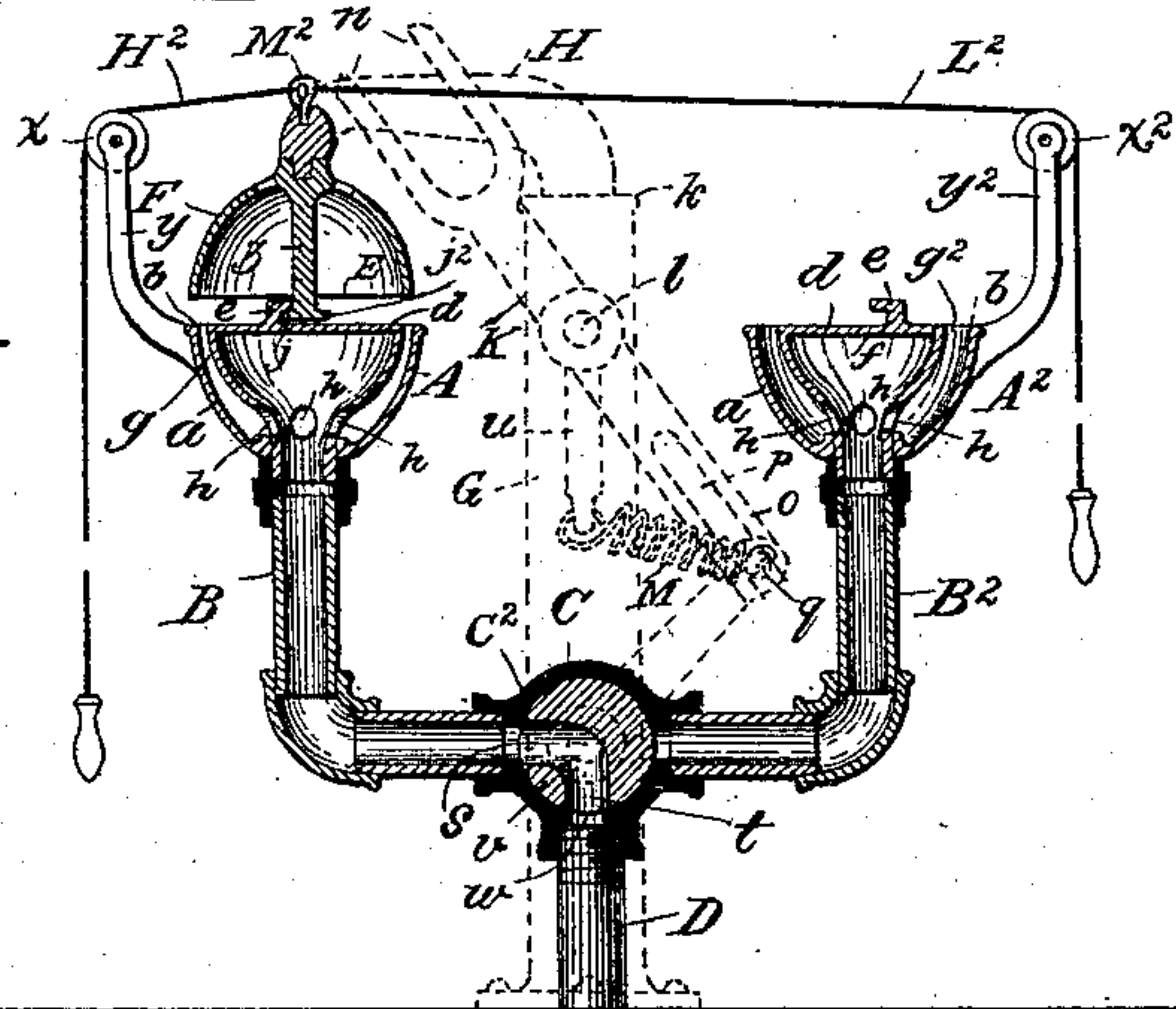


Fig. 4.



WITNESSES.

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AUDIBLE SIGNAL.

SPECIFICATION forming part of Letters Patent No. 372,240, dated October 25, 1887.

Application filed May 13, 1887. Serial No. 238,141. (No model.)

To all whom it may concern:

Be it known that I, JOHN SPEIRS, a citizen of the United States of America, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Audible Signals, of which the following is a specification.

The purpose of this invention is to provide in land and water conveyances—such as steam-boats, sailing-vessels, or railway-trains—audible signals which may be heard by the engineers, &c., on other of such conveyances; and it consists in providing in such conveyances two audible signals or whistles of great dissimilarity in sound or pitch, which are adapted to be sounded, the one to indicate a direction to the right and the other to sound to indicate a direction to the left of the conveyance bearing the signal.

In the accompanying sheet of drawings, Figure 1 is a view in diagram representing two steamboats in a course liable to bring same into collision, but showing by dotted lines the course they will be warned to pursue from hearing the proper signal sounded by the other in accordance with a signaling system to that effect. Fig. 2 is a view in diagram to illustrate the location of several trains of cars on a railway, each train provided with a signaling apparatus of the character named. Fig. 3 is a view in plan of a duplex whistle or signal—that is, one adapted for a sounding of two distinct and dissimilar sounds. Fig. 4 is a vertical sectional view on line 4 4, Fig. 3.

In the drawings, A and A² represent steam-whistle-throat devices, each at the extremity of steam-pipes B B², and each adapted by the proper operation of a cock, C, to be in communication with a pipe, D, from the steam-supply. Each whistle-throat A A² consists of and is formed by an outer hemispherical shell, *a*, open at its top edge, *b*, and an inner hemispherical shell, *d*, each of the latter shells being in communication at its lower part with its respective steam-pipe B B², which latter shell *d* is inclosed at its upper side, as at *f*, and between the top or outer edge of the outer shell, *a*, and the top edge of the inner shell, *d*, is an annular opening or throat, *g*. Communication for steam is formed between the interior of the inner shell, *d*, and the annular

chamber or whistle throat *g* by ports *h*. It will be observed that one of the annular chambers or throats *g* is made much more contracted or narrower than the other throat, *g*². 55

F represents an impinging shell or bell of bowl shape. This shell F is adapted by suitable means, as hereinafter described, or otherwise, to be placed and held in a position directly over and concentric with the annular opening of either one or the other of the whistle-throat devices A or A², and, as shown in Figs. 3 and 4, is in the position over the most contracted throat device A, and on a passage of steam through the pipes D B into the inner shell, *d*, and thence through the ports *h* into and through annular throat-chamber *g*, and impinging upon the lower rim, E, of the shell F, a sounding or whistle of comparatively high or shrill tone is produced, as is obvious and usual. On a shifting of the impinging-shell F to a corresponding concentric position in relation to the enlarged throat device A² to that described in relation to the contracted throat device A; and on a proper diversion of the steam into and through the pipe B² and the chamber and passages of the throat device A², the steam issuing from such enlarged throat device, impinging upon the rim E of the same shell, F, will produce a deep or resonant tone. 60 65 70 75 80

The shell F is provided with perforations at its upper side to allow the escape of steam forced within same from the whistle-throat.

G represents a vertical standard located in a lateral line midway of the two whistle-throats, and at the upper end, *k*, of this standard G, hung in any suitable form of swivel-joint, is a horizontal radius-arm, H, at the outer end of which is rigidly hung the impinging-shell F, and the said pivotal point *k* is so located, as stated, that on a swing of the said radius-arm H sufficiently in either direction it will bring the impinging-ring concentric with the annular throat-opening of either one or the other of the whistle-throat devices A or A². 85 90 95

K represents a lever-arm hung midway of its length by a pivot, *l*, upon a boss, *m*, of the vertical standard G. This lever-arm K at its upper end is bifurcated, as at *n*, and the prongs thereof bear upon the opposite sides of the ra- 100

dius-arm H. The other or lower end, *o*, of the lever-arm K engages by a slot, *p*, with a stud, *q*, on the end of a lever, L, that is rigidly attached to the stem *r* of the steam-cock C. The steam-cock C is provided with passages *s* and *t*. (See Fig. 4.) A spiral spring, M, is arranged between the end *o* of the lever K and a rigid vertical stud, *u*, extending downwardly from the boss *m* on the standard G, which tends to hold the lever-arm K vertical, or substantially so, as its normal position, resulting in placing (through its engagement by its forked end with the radius-arm H) said radius arm, and with it the impinging-shell F, in a position midway between the two whistle-throat devices A A², and also, through the connection by its lower end, *o*, with the lever L, attached to the valve-stem of the cock, in placing said cock in such a position that the solid part *v* thereof closes the steam-passage *w* from the pipe D, and thereby shuts off the entrance of steam to either throat device.

M² represents an eye upon the end of the radius-arm H, to which are attached two cords or chains, H² and L², passing thence in opposite directions over guide-pulleys *x* *x*², hung in brackets *y* *y*², secured on the outer shells, *a*, of the throat devices A A², and these pull-cords H² L² are carried through any suitable guides to a convenient position in the pilot-house, cab, &c., and are there properly disposed for easy access and manipulation by the pilot, engineer, or other attendant.

z represents a downwardly-projecting rigid post on the impinging-shell F, in the axial line thereof, and at its extremity it has opposed flanges *j* and *j*², and upon the top cap-plates of the inner shells, *d*, are stops or abutments *e* *e*² in a horizontal plane coincident with that of the flanges *j* *j*² on the post *z*.

Assuming that the lever-arm K, under the reaction of its spring M, is in its normal position, the radius-arm with the impingement-shell midway between the two whistle-throats, and the valve of the steam-cock with its solid portion *v* closing the passage *w* from the steam-pipe, and that, in accordance with any signal system, or for other reason, it is desired to sound a whistle of high pitch, the pull-cord H² is pulled for a sufficient distance, and the end of the radius-arm H is moved to the left until the flange *j* on the post *z* comes to a bearing against the abutment *e* and the impinging-shell is over and concentric with the annular whistle-throat A. The valve-stem of the steam-cock has (through its connection with the lower end of the lever K) been brought into a position to place its angularly-arranged openings *t* *s*, the former opposite the passage opening from the steam-supply and the latter opposite the passage to the whistle-throat A, and the steam, following the course it is thereby permitted by the various parts of this apparatus, produces a sounding of the whistle of high tone, formed by the combination of the contracted annular throat device and the impingement-plate, and these conditions and re-

lations of parts are illustrated in the drawings, Figs. 3 and 4.

Again, under the same conditions as hereinbefore just assumed, instead of pulling the cord H², the cord L² is pulled upon, it being clearly understood that the impingement-shell is carried for the desired effect over the other or enlarged annular throat A², the steam-cock is manipulated to allow the steam to enter and pass through the said enlarged annular throat, and a consequent sounding of a whistle-tone of low pitch is secured, and it is of course well understood that the difference in tone is regulated and determined by sizes of the annular throat-openings *g* *g*².

Under the mechanism described it will be seen that the movement of either pull-cord effects the placing of the impingement-plate in position over the respective whistle-throat, and also opens the steam communication to such throat, and that on a release of such pull-cord the parts are automatically carried out of position for causing a whistle tone and the steam communication closed.

While a particular means of changing the position of the impingement-shell in its relation to the two whistle-throats has been illustrated and described, other means therefor may be substituted without departing from the present invention, and it is not intended to limit same to any particular manner of its accomplishment.

The practicability and utility of the apparatus described—for instance, when applied on steamboats or other vessels sailing in a fog—is apparent, for should vessels be in proximity and following a course liable to bring them into collision a sounding of the whistle of shrill or high tone by either vessel will be understood to mean that the vessel is following a course to port, while the sounding of the whistle of low or deep tone will be understood to indicate that the vessel is following a course to starboard, or vice versa, according to the fixed code or signal system among mariners, and thus disaster may be avoided; and on railroad-trains the same signals are useful, for should it be understood that all up-bound trains should sound the shrill whistle and all down-bound trains the deep whistle accidents may be avoided, due to the fact that should a down-bound train, for instance, hear a deep whistle on another train similar in tone to its own deep whistle the engineer will know that there is another train in proximity on his track and modify his speed accordingly.

While in this specification steam has been particularly mentioned as the whistle-producing agent, air forced in a similar manner as described for the steam will produce practical results, and it is understood that air is, so far as this invention is concerned, the equivalent of steam.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with two whistle-throats

of different areas, substantially as described, suitably adapted for the passage of steam through them, of a shifting impinging-shell provided with a supporting and shifting means 5 whereby said shell may be placed in position in relation to either of said whistle-throats, all substantially as and for the purpose described.

2. The combination, with two whistle-throats 10 of different areas, substantially as described, each placed on a separate branch of a main steam-pipe, and a valve at the junction of said branches, of a shifting impinging-shell suitably supported and adapted to be placed in 15 operative position in relation to either of said whistle-throats, and of an intervening mechanism between the support for the said shell and the valve that is actuated by and in conjunction with said support, and is adapted to 20 operate said valve in a manner to open steam communication to either throat at the time that the impinging-shell is moved in proper position over said throat, substantially as described, for the purpose specified.

25 3. The combination, with two whistle-throats of different areas, each placed in separate branches, $B B^2$, of a main steam-pipe, D , and a cock, C , having passages s and t at the junction of said branches, having on its stem a rigidly attached lever, L , of an impinging-shell, 30 F , hung upon an arm, H , swiveling in a standard, G , adapted to be swung into operative position in relation to either of said throats, and of a lever-arm, K , pivoted midway of its 35 length upon said standard, one end of which engages with the arm H and the other with the valve-lever L , all arranged for operation substantially as described, for the purpose specified.

40 4. The combination, with two whistle-throats of different areas, each placed on separate branches, $B B^2$, of a main steam-pipe, D , and a

cock, C , having passages s and t at the junction of said branches and having a stem and rigid lever, L , thereon, of an impinging-shell, F , 45 hung upon a swiveling arm, H , on a standard, G , which has boss m and stud u , a lever-arm, K , pivoted midway of its length upon said standard, one end of which engages with the arm H and the other with the valve-lever L , 50 and a spring attached at one end to the end of said arm H and by its other to the stud u , and all arranged for operation substantially as described, for the purpose specified.

5. The combination, with two whistle-throats 55 of different areas, each consisting of inner casing, d , and outer shell, a , with annular space between them, the inner shell having abutments $e e^2$ on the upper side and being in communication with branch steam-pipe, and having 60 ports h leading to the said annular space, of a shifting impinging-shell having post z and flanges $j j^2$, hung upon an arm, H , swiveling in a standard, G , and adapted to be swung into position in relation to either of said 65 throats, substantially as described.

6. The combination, with two whistle-throat devices, $A A^2$, having throats of different areas, substantially such as described, and on 70 which are located brackets, pulleys, and abutments $e e^2$, of an impinging-shell hung upon a swinging radius arm, H , which shell has a post, z , and flanges $j j^2$, and pull-cords $H^2 L^2$, secured to said radius-arm, and all arranged for operation substantially as described, for 75 the purpose specified.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two witnesses.

JOHN SPEIRS.

Witnesses:

WM. S. BELLOWS,
ALEX. F. BLINN.