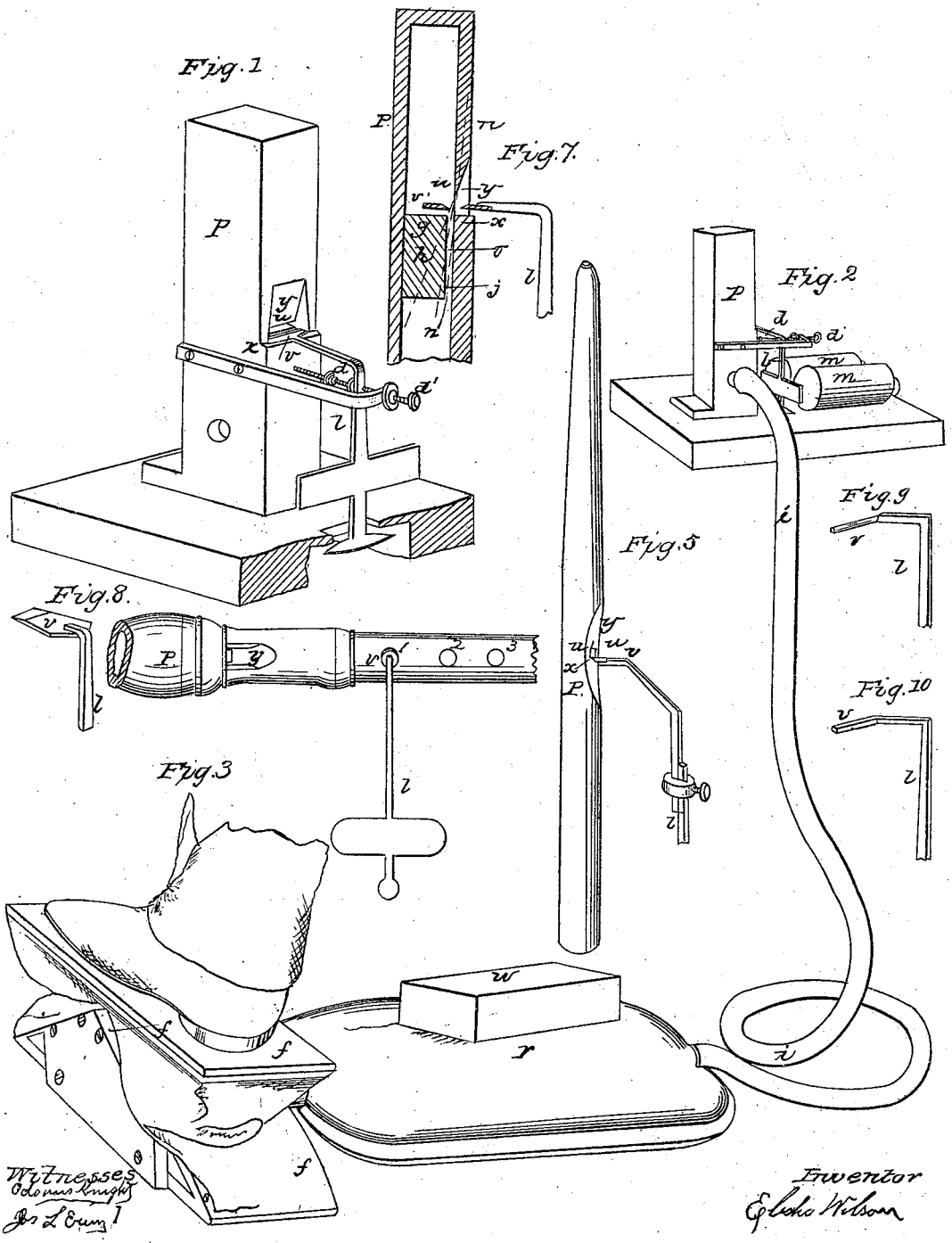
E. WILSON.

Sounding Telegraph.

No. 52,481. Patented Feb. 6, 1866.



UNITED STATES PATENT OFFICE.

ELISHA WILSON, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN SOUNDING-TELEGRAPHS.

Specification forming part of Letters Patent No. **52,481**, dated February 6, 1866.

To allwhom it may concern:

Be t known that I, ELISHA WILSON, of the city ad county of New Haven, and State of Connecticut, have invented an improvement in the aplication of sounds produced from pipes, tubes or any instrument that can be made to soun by air, vapor, or gas to the purposes of electo-telegraphy; and I do hereby declare the fdlowing to be a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in effectually controlling the sounding of any air or vapor sounding instrument, for the purposes of electro-telegraphy without stoppage of the flowing vapor or current. By my invention intelligent signals may be obtained from intermittent or continuous sound—*i. e.*, the sound is entirely suppressed, or not at all, or only partially. From continuous sound the signals are obtained by transition from one pitch-tone or pulsation to another. By "change of pitch or key," I mean a full or partial transition from one letter of the musical scale to another. By "change of tone," I mean a transition from one voice or kind of sound to a different voice or tone, whether in the same or a different key or pitch. By "pulsation," I mean a simple beat, inflection, articulation, or cadence, whether in the same or a different tone or pitch—usually a pulsation occurs in the same tone—all which changes are effected in different degrees, according to circumstances, such as position of tongue *v*, quantity and force of current, and the proportion of the parts of the mouth, tongue, and throat relatively to each other. All valve-stop and cut-off arrangements being dispensed with, less power is required, for to close and open by valve-stop or otherwise a channel for the flowing current will evidently require more working force than merely to intercept or extinguish the vibrations without essentially opposing the force of the current, as by the device herein described.

The object sought is to obtain the greatest ease with the slightest needful degree of motion, and thus to reduce the whole labor thereof to the capacity of the lowest practical power of the line-magnet in all circumstances.

My invention is represented by the Drawing No. 2.

Like letters refer to like parts.

p is an air or organ pipe, Figures 1 and 2, of wood, and Fig. 5 a section of lead pipe. *y* is the mouth or general cavity of the speaking-orifice, Figs. 1, 7, and 5. *o*, Fig. 7, is the opening of the throat. *u* is the upper, and *x* the lower, lip. *g* is the guttural or back of the throat. *l*, Figs. 1, 2, 5, 6, 7, 8, 9, 10, is the armature-lever, terminating in or attached to the pallet or tongue *v*, which latter may take any convenient form adapted to the mouth *y*.

In Figs. 1, 7, and 8, *v* is a thin flat plate. The line of its anterior edge should be conformed to that of the throat, which in pipe *p* is straight. In Figs. 7 and 10 *v* has a long flat form. In Fig. 9 *v* assumes the form of a round rod. It may be rectangular, triangular, or any other shape, provided its anterior line conforms to that of the throat sufficiently to cover it as much as the particular case requires.

Fig. 7 is a sectional side view of the wood pipe *p*. The line *h* I will define to be the guttural line, drawn from the front face of *g* to the inside tip of the upper lip, *u*. To cut off all sonorous vibrations the anterior edge of *v* need advance into the mouth *y* usually to cover about one-half to two-thirds of the open space of the throat *o*. In some cases *v* must advance up to the guttural line *h*. The extreme limit for the suppression of all sound does not extend past line *h* when *v* moves inward. The region of silence is usually found between line *h* and a right line, *n*, drawn from the outer tip of the upper lip, *u*, down to the space of the throat *o*, midway between *g* and *x*, whether *v* moves inward toward *h* or outward from behind *h* and across it, as *v'*. The limit of clear tone is usually found between the guttural line *h* and a right line, *j*, drawn from the inner surface of the lower lip, *x*, to the outer tip of the upper lip, *u*. The region of dead-space between silence and sound may be generally defined by the lines *j* and *n*. The thickness or extent of the dead-space must be traversed by the anterior edge of *v* to suppress all or permit clear sound.

To find the dead-space and set the tongue *v* for use, turn back screw *d*, Figs. 1 and 2, carry *v* forward until you arrive at the exact point of silence, set the screw there, then carry lever *l* back to the opposite screw, *d'*, turn the latter forward until you arrive at the limit of

sound verging on the dead-space, and the adjustment is finished.

To change the tone or pitch only, elevate the tongue *v* anywhere above and clear of the guttural *g* and throat *o*, turn the screw *d* forward, bearing *v* back until you arrive just within the limit of sound, then let the other screw, *d'*, recede only sufficiently to allow a slight play of lever *l*. The exact elevation of *v* between the lips *u* and *x*, or its position before the guttural line *h* or behind it, as *v'*, Fig. 7, is not important.

In Figs. 9 and 10, *v*, and *v'* in 7, are adapted to be placed either before or behind and inside of line *h*. In the latter case the motion of the armature-lever *l* and of the tongue must be reversed, and proceed from within the cavity of the mouth outward. It requires also a corresponding change in the position of the magnet M, unless what is known as the "open-circuit key" is employed. This mode may be preferable with some, and is equally effective to suppress sound, which occurs the instant *v'* or *v* strikes into and across the line *h* enough to cover the upper lip, *u*, against the impinging current which vibrates thereon. The above applies to air and vapor currents generally; but whether it pertains to air or vapor whistles, or whatever may be the exigencies of the case, the form and motion of *v* or *v'* must be adapted to the form of the sounding-orifice and of the throat. In controlling sound at the primary orifice where the current is in force, said current should have its line of motion at right angles to that of *v* or *v'*.

To obtain intelligent signals at any secondary orifice, I may use a close stop or valve attached to the armature-lever *l*, as there is no direct force of current to encounter.

Fig. 6 represents part of the front view of a flageolet. *y* is the main, and the finger-stops 1 2 3 are the secondary, sounding-orifices. *v* is the stop, and *l* the armature-lever. The lowest power of the magnet will suffice to operate this. Clear and distinct signals are thus obtained by a change of pitch or key In the use of pitch the transition should be always made from the lower to the higher key, the letter or parts of the letter being enunciated by the higher, and the spaces intermediate between their parts and the letters themselves, and also between the words they form, being represented by the lower.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Controlling either continuous or intermittent air, gas, or vapor sounding for telegraphic puposes without stopping the flow of the air, gas, or vapor by which the sound is produced.

2. A pallet or tongue, *v* or *v'*, or any substantially equivalent device adapted to intercept, regulate, or control the vibrations of air, gas, or vapor against the edge of the lip *u* in order to vary or suppress the sound, substantially as explained.

3. The employment of continuous sound from air, gas, or vapor sounding instruments for telegraphic signals by transition from one tone or pitch, key, or pulsation to another, either at the main or at any secondary sounding-orifice, substantially as above set forth.

Witnesses: ELISHA WILSON.
OCTAVIUS KNIGHT,
EDWARD H. KNIGHT.