

(No Model.)

2 Sheets—Sheet 1.

L. K. FULLER.
ORGAN.

No. 543,526.

Patented July 30, 1895.

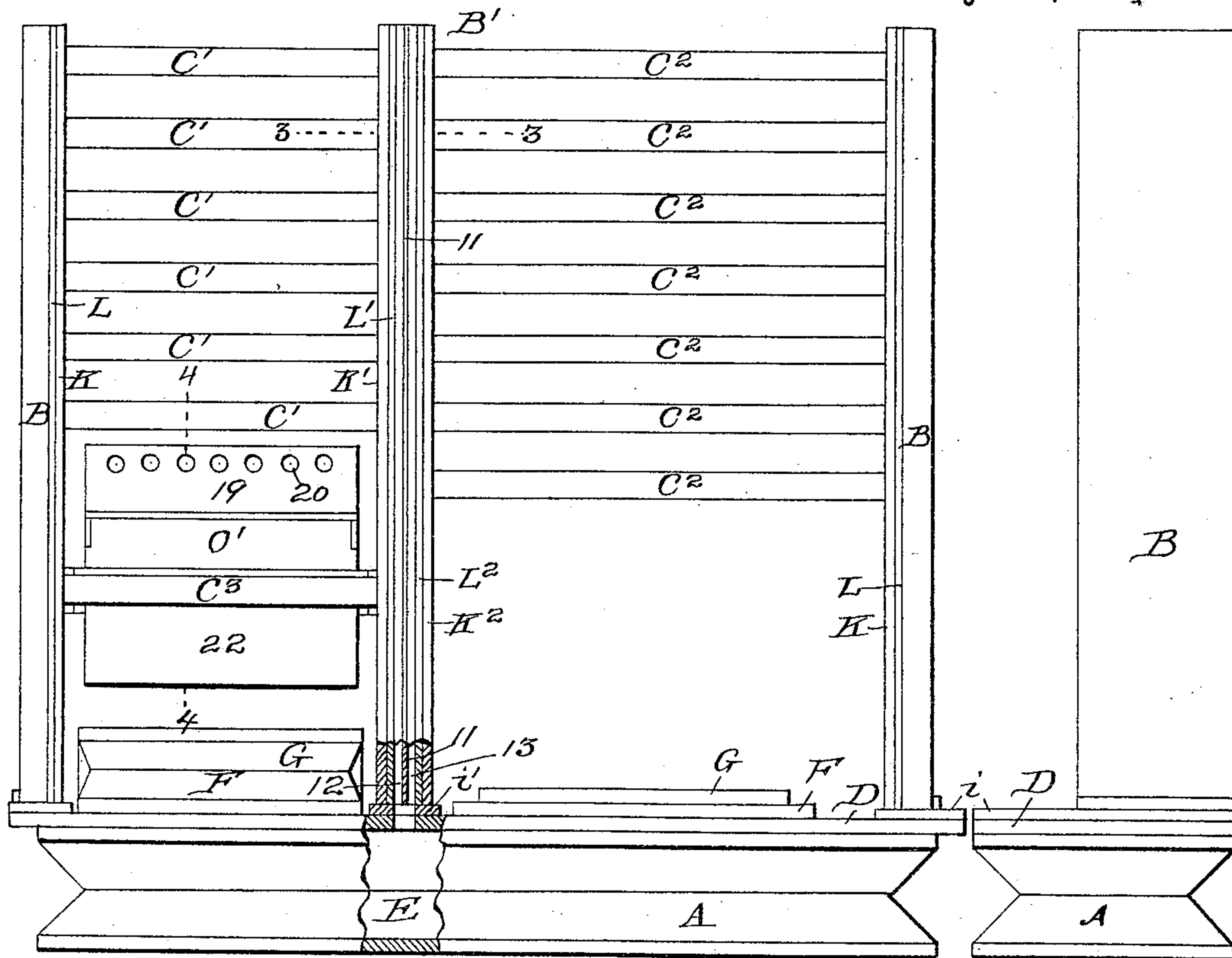


Fig. 1.

Fig. 2.

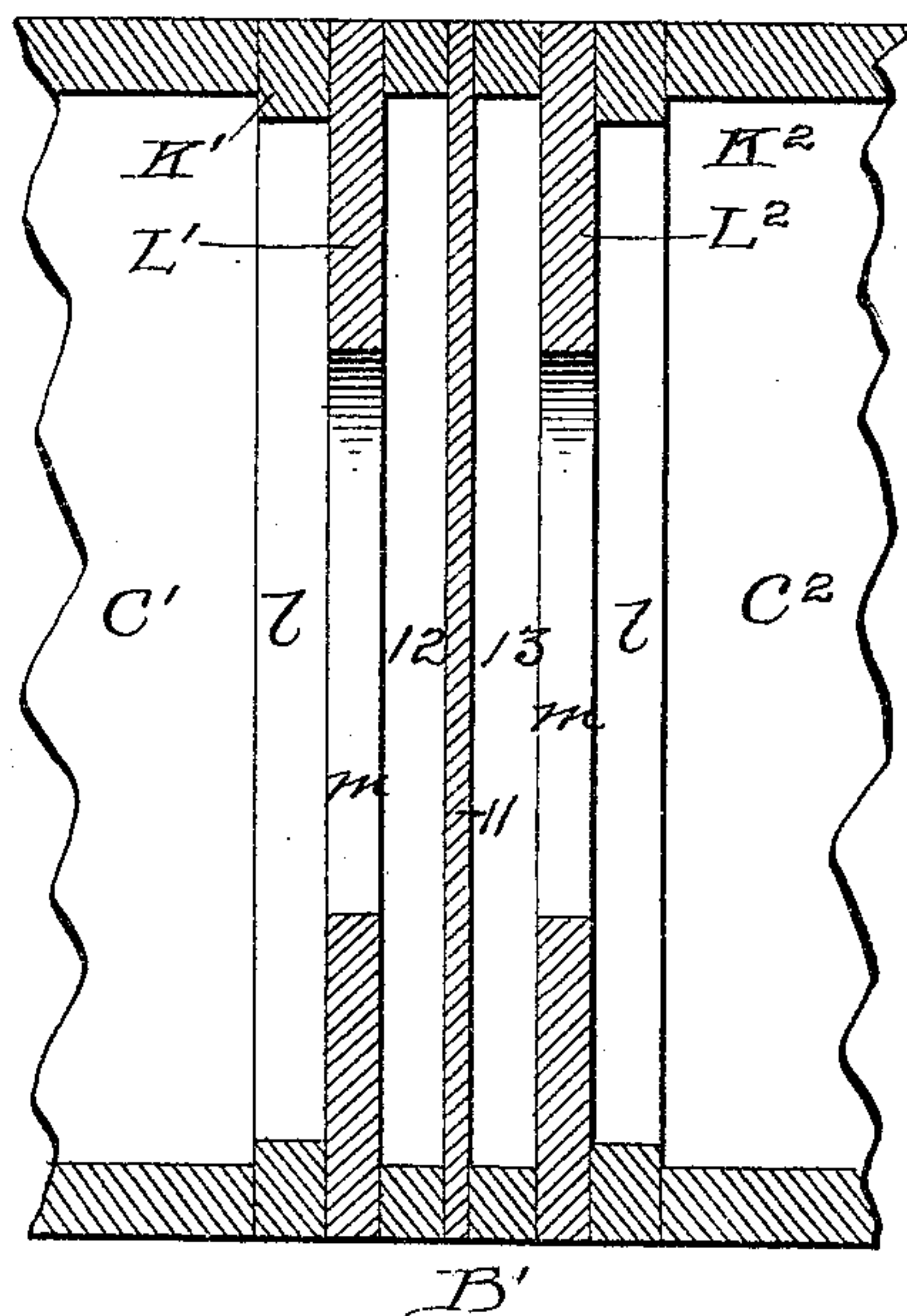


Fig. 3.

Witnesses
Albert B. Blackwood
Parleton & Snell.

Inventor
Levi K. Fuller
by Arthur B. Brown
his Attorney

(No Model.)

2 Sheets—Sheet 2.

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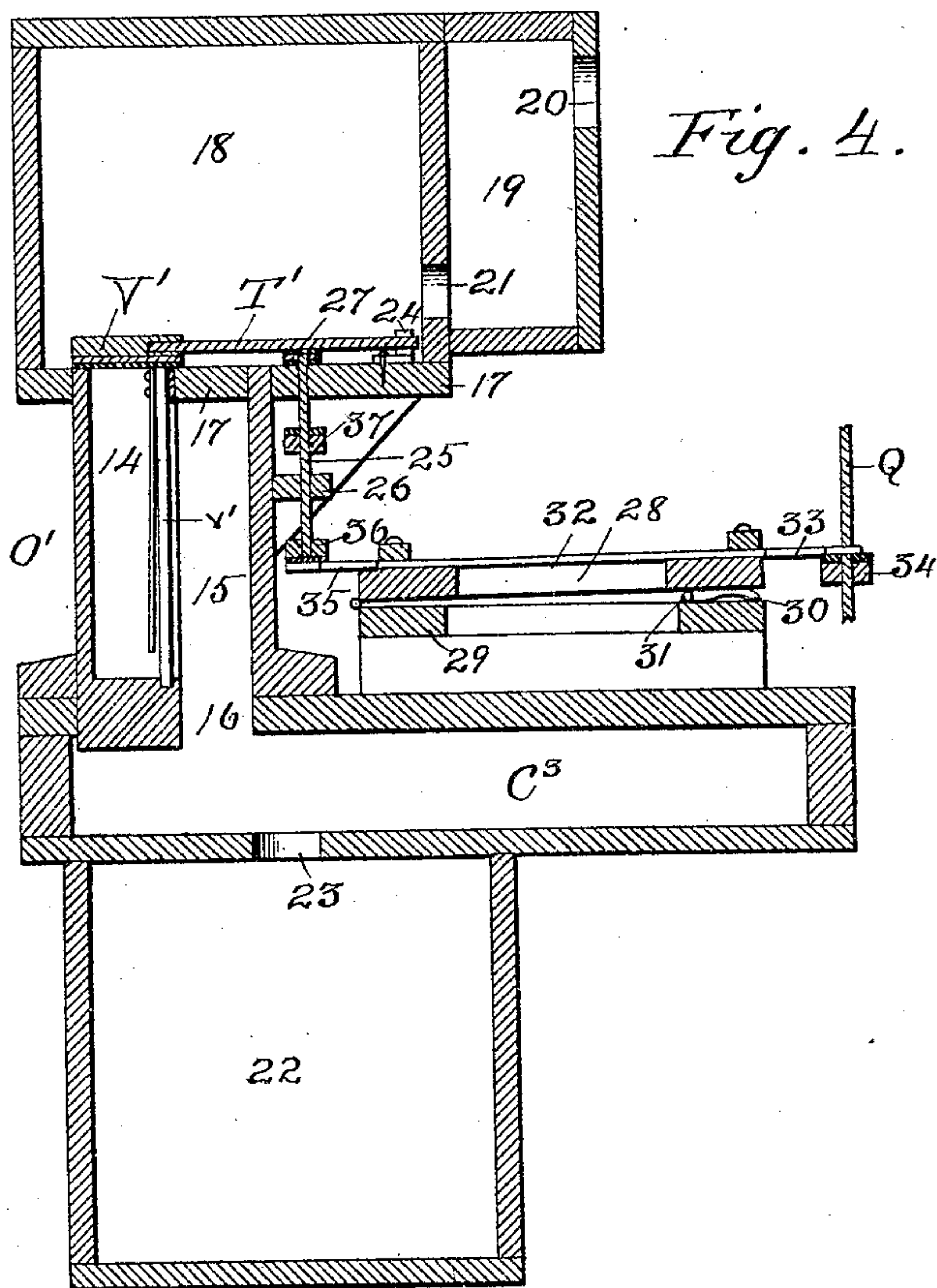


Fig. 4.

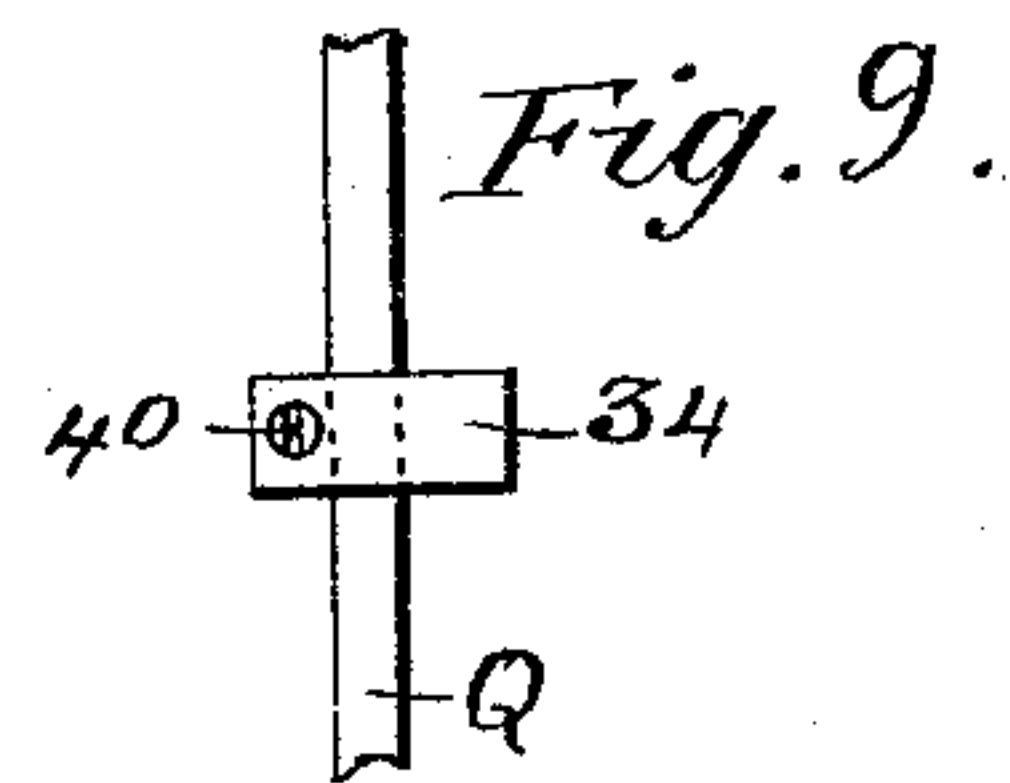


Fig. 9.

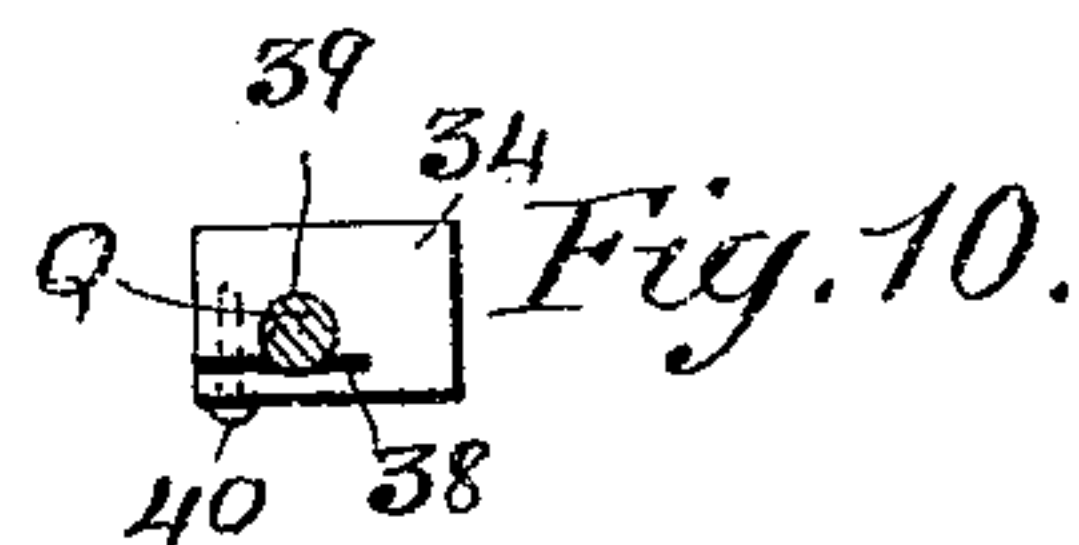


Fig. 10.

Fig. 7.

Fig. 6.

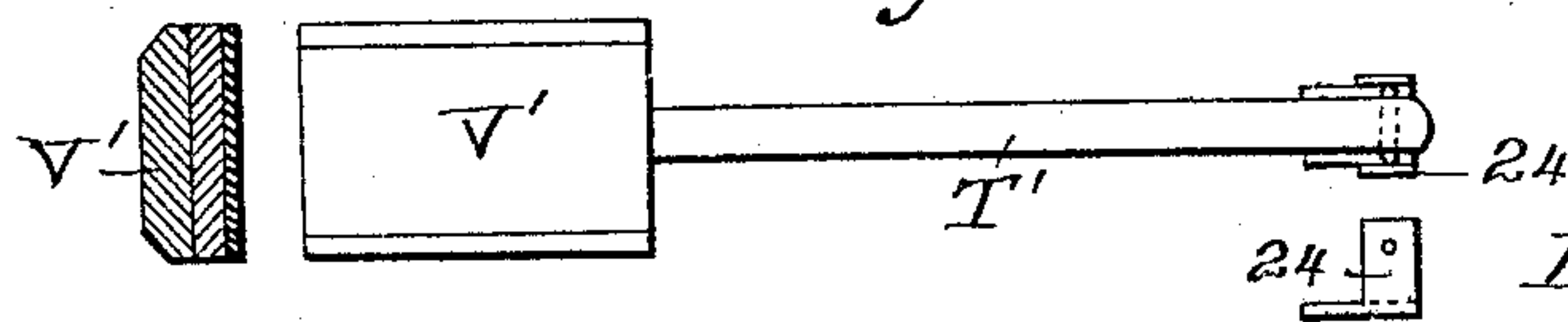


Fig. 8.

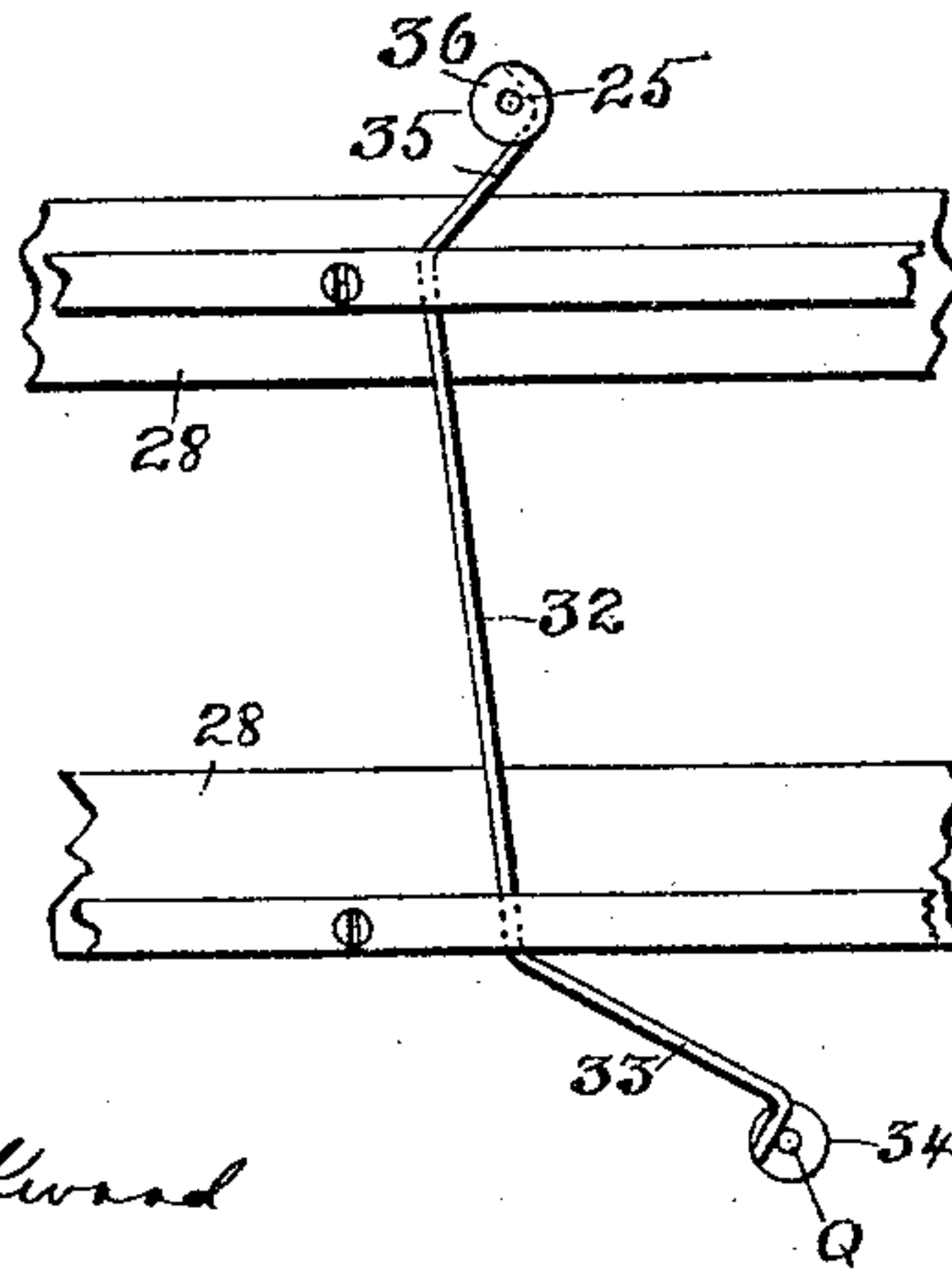


Fig. 5.

Witnesses
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Parleton & Snell.

Inventor
Levi K. Fuller
by Arthur Browne
his Attorney

UNITED STATES PATENT OFFICE.

LEVI K. FULLER, OF BRATTLEBOROUGH, VERMONT, ASSIGNOR TO THE
ESTEY ORGAN COMPANY, OF SAME PLACE.

ORGAN.

SPECIFICATION forming part of Letters Patent No. 543,526, dated July 30, 1895.

Application filed November 8, 1893. Serial No. 490,334. (No model.)

To all whom it may concern

Be it known that I, LEVI K. FULLER, a resident of Brattleborough, in the county of Windham and State of Vermont, have invented certain new and useful Improvements in Organs, of which the following is a specification.

The present invention consists in certain improvements upon that class of reed-organs wherein there are two vertical main wind-conductors at opposite ends of the organ-case which communicate at their lower ends with the bellows-chamber, and horizontal wind-chests or resonance-chambers which extend between the wind-conductors and communicate therewith, said wind-chests supporting the reed sets. This class of organs is illustrated, for example, in Letters Patent of the United States No. 502,666, granted August 1, 1893, to my assignee, the Estey Organ Company.

The present improvements constituting the present invention consist, first, in a "third conductor" dividing and separating the horizontal wind-chests between the bass and treble, and, second, in the construction of the sub-bass and its action.

The present improvements are illustrated in the accompanying drawings, wherein—
Figure 1 is a front elevation, partly in vertical section and diagrammatic in its character, of the bellows, main wind-conductors, wind-chests or resonance-chambers, third conductor, and sub-bass. Fig. 2 is a side view thereof. Fig. 3 is a horizontal section through the third conductor in a plane indicated by the line 3 3 in Fig. 1. Fig. 4 is a vertical section through the sub-bass in a plane indicated by the line 4 4 in Fig. 1. Fig. 5 is a plan view of a portion of the sub-bass coupler. Figs. 6, 7, and 8 are detail views of one of the sub-bass reed-valves. Figs. 9 and 10 are detail views of one of the action-rods.

Figs. 3, 4, and 5 are drawn to a standard scale, as indicated. Figs. 1 and 2 are drawn to a scale one-fourth of the standard scale, and the remaining figures are drawn to a scale twice the standard scale.

Like letters and numerals of reference in-

dicate corresponding parts in all of the figures, and the reference-letters indicate parts corresponding to the like parts in said Patent No. 502,666.

Referring first to Figs. 1, 2, and 3, A is the bellows, B B the main vertical wind-conductors, D the bellows-foundation, *i i* the reinforcing-plates, E the bellows-chamber, F G the independent exhausters, K K the mute-frames, and L L the front faces of the main vertical wind-conductors, all of which parts are or may be identical with the correspondingly-designated parts in said Patent No. 502,666.

The third conductor.—In a single-manual organ it is necessary or advisable that the register should be divided between the bass and treble, so that where different banks or sets of reeds are employed, as in said Patent No. 502,666, each of the horizontal wind-chests carries a set of reeds containing both bass and treble reeds. This same arrangement is also applicable where more than one manual is employed. In said patent, however, there was a single wind-chest communicating at both ends with the two main wind-conductors B B, which carried both the bass and the treble reeds of each set of reeds.

In accordance with the first of the present improvements the bass wind-chests C' are separated entirely from the treble wind-chests C² by a third or intermediate conductor B'. This third conductor extends vertically midway between and parallel with the main conductors B B, and it is supported upon the bellows-foundation and communicates with the bellows-chamber by means of a reinforcing-plate *i'*, similarly to the main conductors, as described in said Patent No. 502,666.

The detail construction of the third conductor and its relation to the bass and treble reed-chests C' C² is shown in Fig. 3. The third conductor is divided by a vertical partition 11, extending throughout its entire length, into two entirely independent and separate wind-passages 12 13 on the bass and treble sides, respectively, of the said partition 11. Between the bass wind-passage 12 and the bass wind-chest C' there is one side

face or wall L' of the third conductor and a mute-frame K' . Communication is established between the interior of the bass wind-chest C' and the bass-passage 12 by means of an aperture l in the mute-frame K' and an air-port m in the wall L' , which are controlled by a mute and operate exactly like the corresponding parts in said Patent No. 502,666. Between the treble wind-passage 13 and the treble wind-chest C^2 there is the other side face or wall L^2 of the third conductor and a mute-frame K^2 . Communication is established between the interior of the treble wind-chest C^2 and the treble-passage 13 by means of aperture l and air-port m , just as in the case of the bass. The treble and bass are thus entirely independent of each other, and each wind-chest, whether treble or bass, communicates at both ends, when the proper stop or stops are opened, through vertical wind-passages with the bellows-chamber, thus securing the advantages incident to the construction of Patent No. 502,666. The entire separation of the bass and treble wind-chests by the third conductor while still retaining the double communication between each wind-chest (bass or treble) and the bellows-chamber results in the production of a more satisfactory and even quality of tone. Where both the base and the treble reeds communicated with the same wind-chests, as in said Patent No. 502,666, there was a fault in the tone, attributable perhaps to possible uneven distribution of the air, due to the difference in size and flexibility of the reeds when both bass and treble notes were sounded simultaneously. The third conductor, however, overcomes the defect referred to and renders the tones smooth, even, and satisfactory in quality.

Each pair of bass and treble wind-chests or resonance-chambers C' C^2 —that is to say, each two wind-chests C' C^2 which are in line with each other—may be considered as a single wind-chest extending between the two outside or main wind-conductors B B and divided into two sections by the third conductor. Regarded in this light the invention in this respect consists in dividing a single wind-chest into bass and treble sections. The bass and treble sections, however, need not be in alignment.

Certain modifications are feasible in the construction and arrangement of the third or intermediate conductor—for example, the partition 11 might be omitted; but its presence is sometimes necessary and is desirable and is preferred. One special feature of the partition 11 is that it separates the treble-sections of the wind-chests entirely from the bass-sections of the wind-chests, even when all of the mutes are open.

It will be noted that the number of tiers of wind-chests is immaterial and is determined by the desired capacity and range of the instrument.

The two sets of bellows-exhausters F G , it

will be noted, are now located on either side of the third or intermediate conductor, and the sizes of the exhausters are proportionate to the spaces on opposite sides of the said third conductor.

The sub-bass.—The sub-bass mechanism, as shown in Fig. 1, is located beneath the lowest of the ordinary bass-sections of the wind-chests, and between said section and the bellows, the horizontal arrangement of the bellows permitting ample room for this purpose. The sub-bass includes the lowest notes of the organ, and, as is well known, the musical character of the fundamental tones of such low notes is somewhat uncertain, so that the main use of the low notes is to build up or strengthen the resultant or difference tones of simultaneously-sounded higher notes. It is difficult to correctly tune the sub-bass notes and to maintain them in tune, and it is still more difficult to so construct the organ as to insure a smooth, even, and correct quality of tone in them. The improved sub-bass mechanism has accordingly for its primary object a purer, smoother, and more certain quality of tone for the sub-bass reeds.

The sub-bass mechanism includes a horizontally-disposed sub-bass wind-chest or resonance-chamber C^3 , which is connected at opposite ends to one of the main conductors B and the third conductor B' , similarly to the bass-section C' , except that it is unnecessary (as will hereinafter appear) that the air-passages between the wind-chest C^3 and the conductors B and B' should be controlled by mutes, although such mutes might be employed.

The sub-bass reed-set O' is mounted upon and above the wind-chest C^3 , and it as well as the sub-bass reeds v' are disposed vertically on account of the length of the reeds, such vertical arrangement being common in the sub-bass. The reed-cell in which each reed is located is divided by the reed into two vertical passages or ducts 14 15, of which the egress-duct 15 communicates directly through its always-open throat 16 with the wind-chest or resonance-chamber C^3 . The upper end of the egress-duct 15 is permanently closed by a horizontal plate 17, which serves also as the bottom of the usual swell-chamber 18 and as a support for the reed-valve V' . The ingress-duct 14 to the reed communicates at its upper end with the swell-chamber 18, the passage between the same being controlled by the reed-valve V' . The ducts 14 and 15 are here referred to as "ingress" and "egress" ducts, respectively, because the bellows is a suction-bellows.

The swell-chamber 18 does not communicate directly with the outer air, but it communicates with a reinforcing-chamber 19, arranged in front of it. Both the reinforcing-chamber 19 and the swell-chamber 18 extend the entire length of the sub-reed set O' , as shown in Fig. 1. The reinforcing-chamber

communicates with the external air through a suitable number of air-inlets 20, and the reinforcing-chamber and swell-chamber communicate through several air-inlets 21. The
5 air-inlets 20 21 are not in line with each other, so that air cannot pass in a straight line from the external air to the passages to the ingress-ducts 14, whereby the full effects of the swell-chamber 18 are secured.

10 Suspended beneath the wind-chest is a resonance-chamber 22, which communicates with the wind-chest through one or more ports 23. The ports 23 are preferably the only openings into the resonance-chamber 22. The
15 presence of the resonance-chamber, as well as of the reinforcing-chamber 19, improves the tone of the sub-bass reeds.

The swell-chamber, resonance-chamber, and reinforcing-chamber are each rectangular with fixed, immovable, and rigid walls in
20 planes at right angles to each other.

Only one sub-reed is shown, but the sub-bass ordinarily contains thirteen reeds, although any desired number may be employed.
25 Since the several reeds and their respective operating mechanism are all alike structurally, a single reed and operating mechanism therefor is illustrated.

The sub-reed valve V' is properly padded,
30 as usual, and normally closes the air-passage to the reed. The valve is shown in cross-section in Fig. 7 and in plan in Fig. 6. It is carried at one end of a horizontally-extending valve-lever T', which is pivoted at its forward
35 end to the bearing 24, secured to the plate 17 within the swell-chamber 18. Antifriction-pintles and fulcrum-recesses connect the lever and bearing. The valve is a gravity-valve, closing by gravity, and it is elevated for
40 sounding its reed by means of a vertically and longitudinally movable tracker-pin 25, which passes through a guide-aperture in the plate 17, and is further guided by a guide-aperture in a bracket 26, carried by the reed-set. The padded head 27 of the tracker-pin
45 is directly beneath the shank of the valve-lever.

Q is an action-rod, which is moved upwardly by one of the keys of the manual by
50 any suitable intervening mechanism—such, for example, as is shown in said Patent No. 502,666, or by a pedal—and is moved downwardly by gravity, aided, if necessary, by a spring. Intermediate between the action-rod
55 Q and tracker-pin 25 is the sub-bass coupler 28, which consists of a horizontally-disposed swinging frame hinged at its rear edge to a stationary frame 29, carried by and on top of the sub-bass wind-chest C³ and free to move
60 at its front end. The coupler is swung upwardly by means of a crank 30, on a rock-shaft 31, said rock-shaft being oscillated by suitable stop mechanism. The coupler is elevated positively by the crank 30 and de-
65 scends by gravity, but it might obviously be

operated positively in both directions. The lower position of the coupler is its operative position.

On the upper face of the coupler 28 is provided a horizontally-extending rock-shaft 32
70 for each sub-reed. At its front end the rock-shaft has a crank-arm 33, which co-operates with a suitably-padded button, shoe, or lifter 34, on the action-rod Q, and at its rear end it has a crank-arm 35, (extending from the same
75 side of the shaft as the crank-arm 33,) which co-operates with a suitably padded shoe 36 at the lower end of the tracker-pin 25.

When the proper key of the manual (or the proper pedal of the pedal-cavier) is depressed,
80 the action-rod Q is lifted, and thereby, through the instrumentality of the rock-shaft 32 and the tracker-pin, the valve V' is lifted and the proper reed is sounded. When the key or pedal is released, the several parts resume
85 their normal positions and the valve closes by gravity, aided by the exhausting action of the bellows in case the bellows is of the exhausting character such as is preferably employed and herein indicated.
90

To throw the entire sub-bass out of action it is necessary merely to operate the stop mechanism to elevate the front end of the coupler 28, which swings the cranks 33 out of
95 the paths of their respective lifters 34 on the action-rods Q, and also removes the cranks 35 from operative relation relatively to the shoes 36 of the tracker-pins. Owing to the employment of the coupler 28 the additional power necessary to operate the sub-valves
100 from the keys is dispensed with except when the sub-bass reeds are to be sounded. The presence of the coupler 28 also renders it unnecessary to employ mutes to control the air-passages at the ends of the sub-bass wind-
105 chests C³, although such mutes may be employed as auxiliary to the coupler and for modulating the tone of the sub-bass reeds. Each tracker-pin 25 is provided with a suitably-padded stop 37 to limit its upward move-
110 ment. Each lifter 34 is adjustable along its action-rod Q to facilitate its proper location. The adjustment is effected (see Figs. 9 and 10) by constructing the lifter with a slit or split 38, intersecting the aperture 39, through
115 which the action-rod extends, and by a tightening-screw 40, which crosses said slit 39. By tightening the screw the lifter is firmly clamped to the action-rod.

By making the swell-chamber 18 and reinforcing-chamber 20 removable in a simple manner—that is to say, by having the swell chamber connected to the plate 17 by hooks and guide-pins—the valves V' can be swung
120 forward so that the sub-reeds can be readily removed for cleaning and other purposes. By having the valves V' located above the reeds, and by extending the swell-chamber forward of the reed-set O', the entire operative mechanism is brought outside of the wind-pas-
125 130

sages, so that the passage of air from the reeds to the bellows is wholly unobstructed and all opportunity for leakage is prevented.

I claim as my invention—

- 5 1. Two wind conductors, and a wind-chest extending therebetween and communicating at opposite ends with said conductors respectively, said wind chest being divided into non-communicating bass and treble sections, in
10 combination with means separating said bass and treble sections, substantially as set forth.
2. Two wind conductors, and a wind chest extending therebetween and communicating at opposite ends with said conductors respectively, said wind chest being divided into bass
15 and treble sections, in combination with a third or intermediate conductor between said bass and treble sections and communicating therewith, substantially as set forth.
- 20 3. Two wind conductors, and a wind chest extending therebetween and communicating at opposite ends with said wind conductors respectively, said wind chest being divided into bass and treble sections, in combination with
25 a third or intermediate conductor between said bass and treble sections and having two independent air passages communicating with said bass and treble sections respectively, substantially as set forth.
- 30 4. Bass and treble wind chests, in combination with the bellows, and a conductor between said wind chests communicating with said bellows, said conductor having two independent and separated wind-passages com-
35 municating with said bass and treble wind chests respectively, substantially as set forth.
5. A horizontally-disposed bellows foundation, a bellows chamber therebeneath, two vertical wind conductors rising from said founda-
40 tion and communicating with said bellows chamber, and a third or intermediate vertical conductor extending upward from said bellows foundation and having a vertically and longitudinally extending partition dividing
45 the same into two independent air passages both of which communicate with the bellows chamber, in combination with a plurality of bass wind chests extending horizontally and communicating at opposite ends respectively
50 with one of said main conductors and one of the air passages in said third or intermediate conductor, and a plurality of treble wind chests extending horizontally and communicating at opposite ends respectively with the
55 other of said main conductors and the other air passage of said third or intermediate conductor, substantially as set forth.
6. The bellows, and the two main conductors and the third or intermediate conductor communicating therewith, in combination with
60 exhausters for said bellows located on opposite sides of said third or intermediate conductor, substantially as set forth.
7. The horizontal bellows foundation, the
65 bellows therebeneath, side main wind conductors and a third or intermediate conductor

extending upwardly from the bellows foundation, bass wind chests extending between one of said main conductors and the third conductor and communicating with both, and
70 treble wind chests extending between the other of said main conductors and the third conductor, in combination with a sub-bass mechanism located above the bellows and below the other bass wind chests, said sub-bass
75 mechanism including a wind chest communicating at opposite ends with the third conductor and the same main conductor with which the other bass wind chests communi-
80 cate, substantially as set forth.

8. The combination of the horizontal wind-chest having communication with the bellows through its end or ends, the resonance chamber beneath the same, the vertically extending reed-set above the wind chest, the swell
85 chamber above the reed set, the reed valves within the swell chamber and above the reed set, and the reinforcing chamber in front of the swell chamber, substantially as set forth.

9. The horizontal wind chest, the reed set
90 upon and above the same, the swell chamber above the reed set, and a gravity-closing pivoted horizontal reed-valve within the swell chamber and on the air ingress side of the air duct leading to the corresponding reed, in
95 combination with a vertically-extending and movable action-rod, a pivoted swinging coupler supported upon and above the wind chest in front of the reed set, a vertically-movable
100 tracker-pin supported in guides in front of the reed set, behind said coupler, and extending within the swell chamber beneath the reed valves, and a rock-shaft on said coupler extending from said action-rod to said tracker-
105 pin, substantially as set forth.

10. The sub-bass reed set, and the wind chest on the eduction side thereof, in combination with valves for said reed set on the induction side thereof, and operating and coupling mechanism for said valves wholly exterior to said reed-set, wind-chest, and the air
110 passages therebetween, substantially as set forth.

11. The combination of the gravity-closing reed valve and the bearing therefor, said reed
115 valve being pivoted between the cheeks of said bearing by an anti-friction pivot, substantially as set forth.

12. The wind-chest, the swell chamber, and the reed-set between the wind-chest and swell-
120 chamber, in combination with the reed-valves within the swell-chamber and on the induction side of the reed-set, and operating mechanism for said valves wholly exterior to the wind-chest and reed-set, substantially as set
125 forth.

13. The horizontal wind-chest, the vertically-disposed reed-set mounted above and upon the rear end of said wind-chest, and the swell-chamber located above the reed-set and
130 extending forward of the same, in combination with the reed-valves located within the

swell-chamber on the induction side of the reed-set, a coupling mechanism mounted above and upon the wind-chest in front of the reed-set, and reed-valve-operating tracker-
5 pins extending upwardly from the coupling mechanism through the overhanging bottom of the swell-chamber, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LEVI K. FULLER.

Witnesses:

H. F. C. TÖDT,
W. H. CHILDS.