(No Model.)

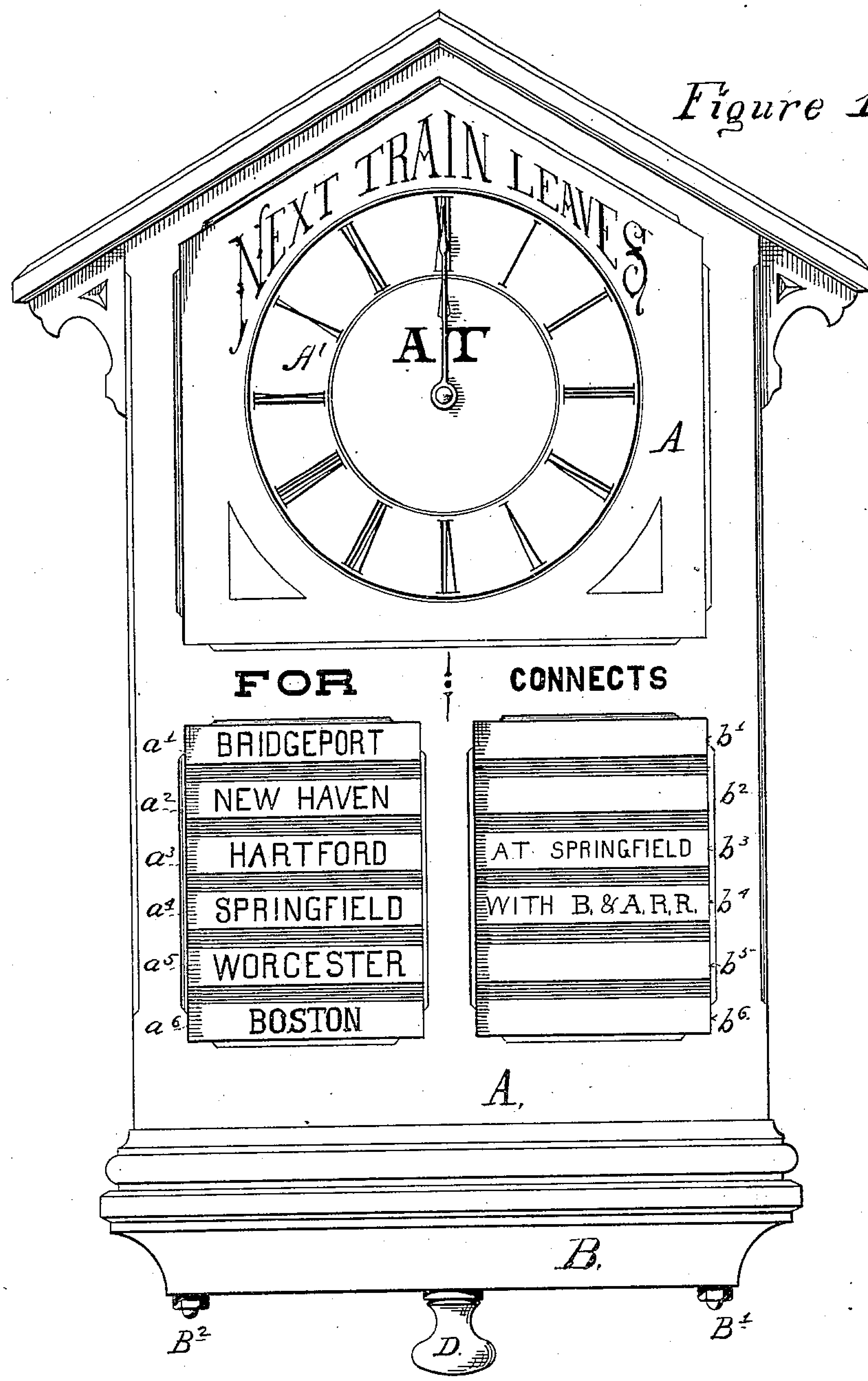
4 Sheets—Sheet 1.

E. S. BOYNTON.

INFORMATION TABLET.

No. 258,529. Patented May 23, 1882.

Figure 1.



Witnesses

Inventor.
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by his attorney

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.)

4 Sheets—Sheet 2.

E. S. BOYNTON.

INFORMATION TABLET.

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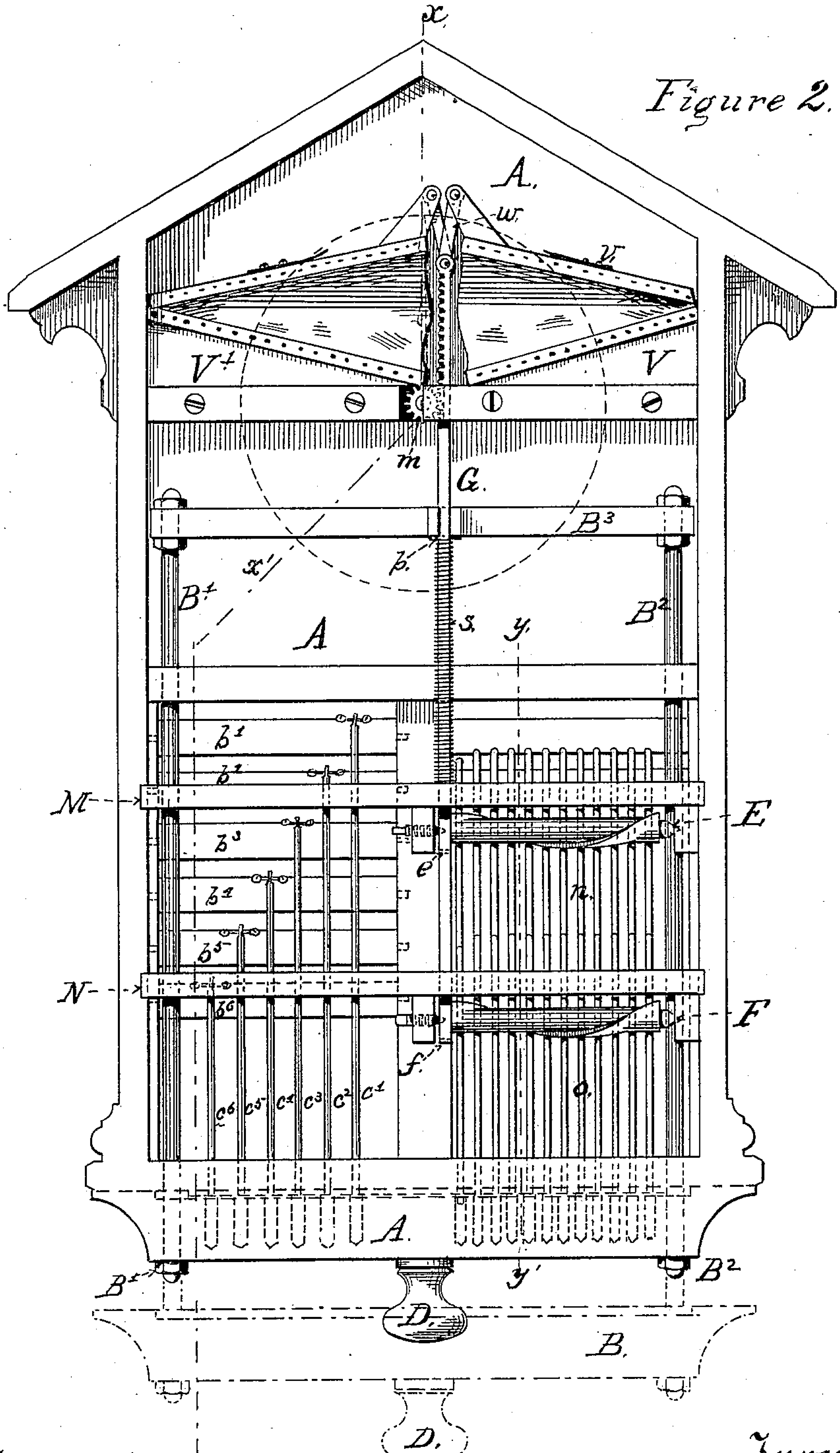

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(No Model.) 4 Sheets—Sheet 3.

E. S. BOYNTON.

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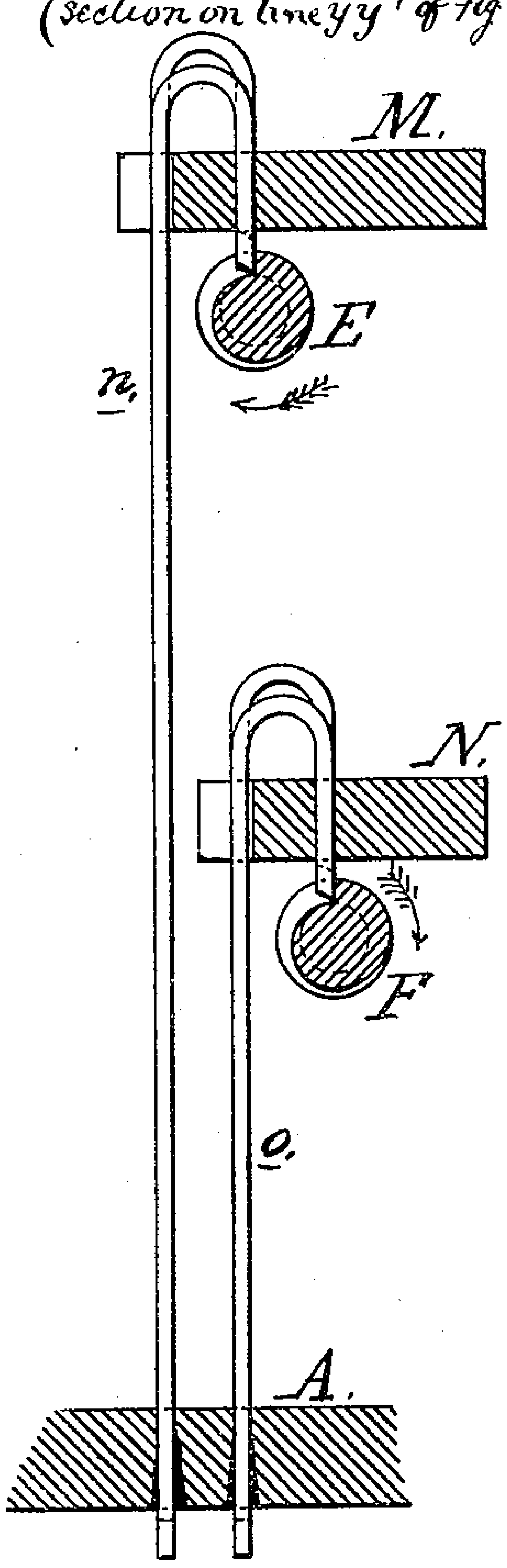
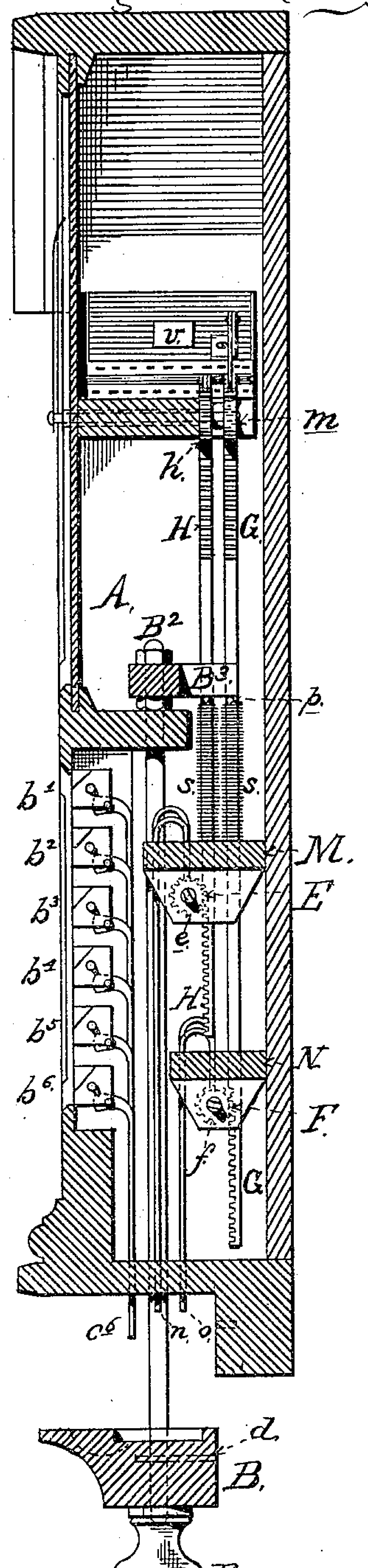
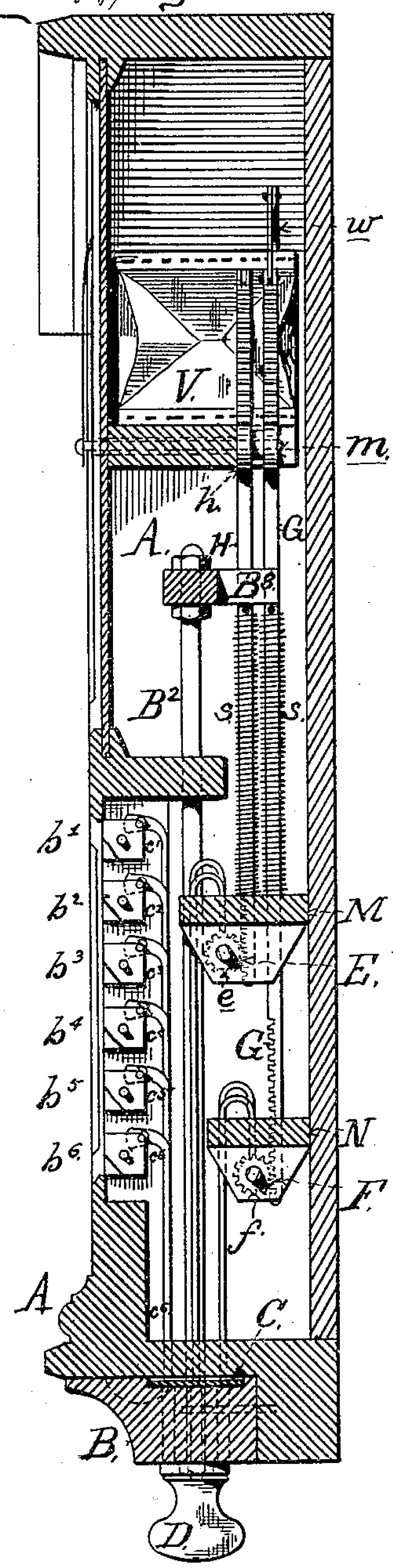
No. 258,529. Patented May 23, 1882.

Figure 4, (sections on line x x' of fig 2) Figure 3

Figure 6. (section on line y y' of fig 2)







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(No Model.) 4 Sheets—Sheet 4.

E. S. BOYNTON.

INFORMATION TABLET.

No. 258,529. Patented May 23, 1882.

Figure 7

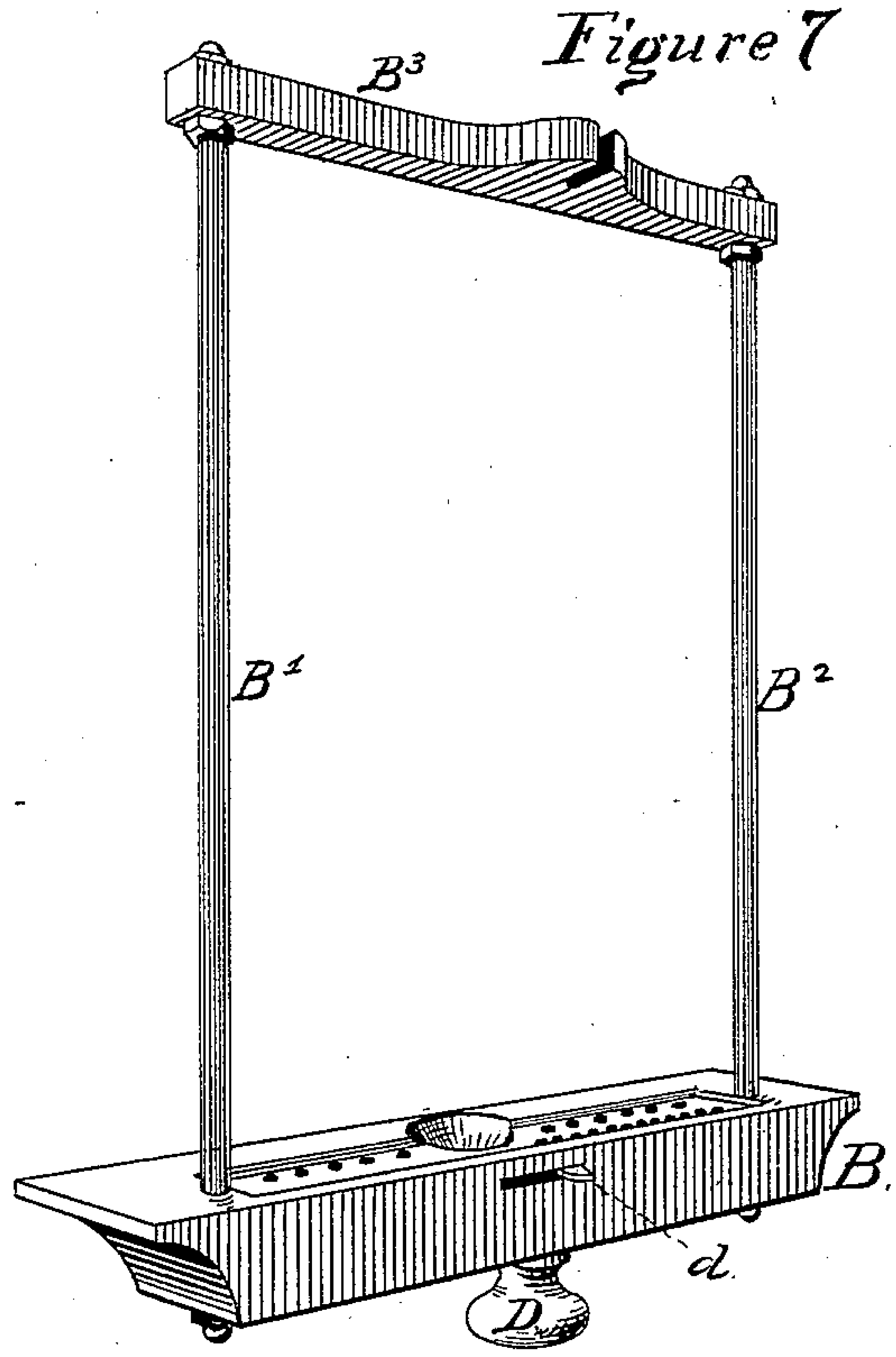


Fig. 8.

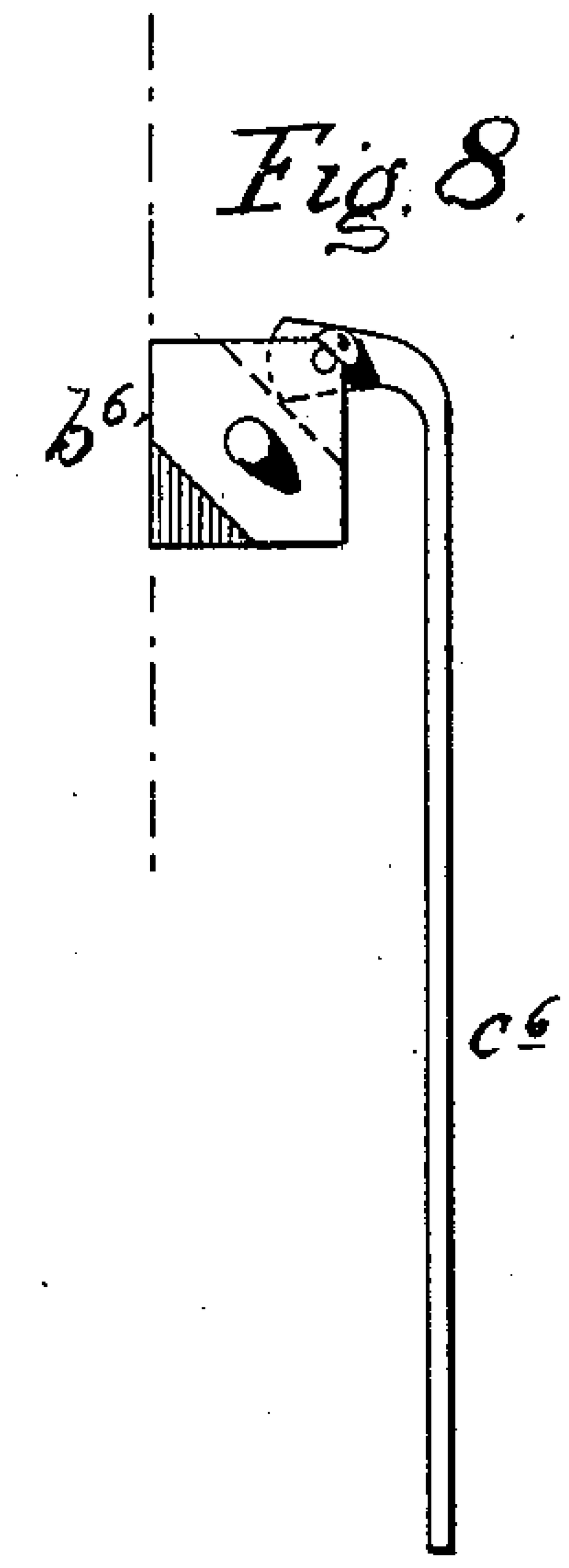


Fig. 9.

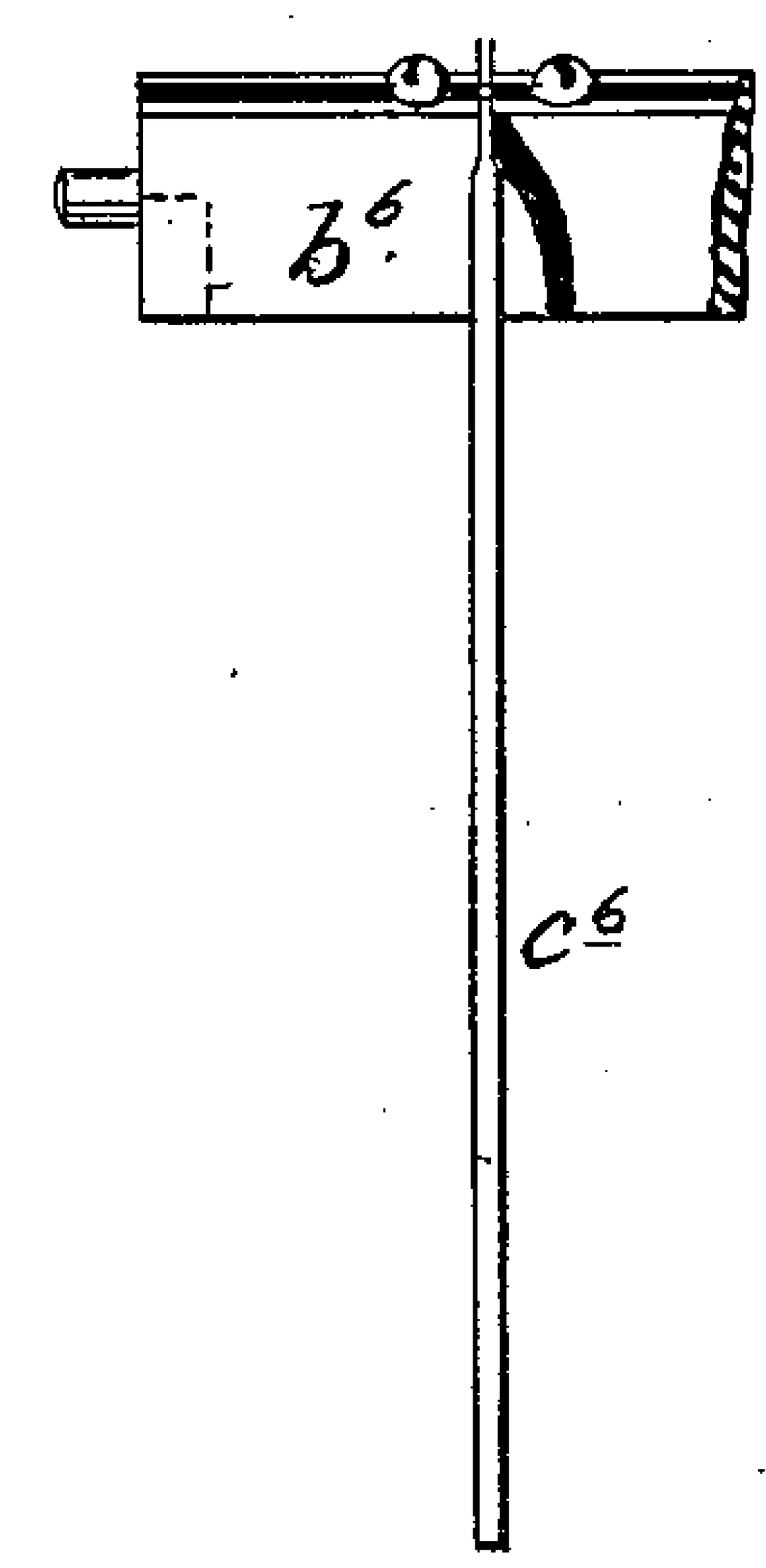
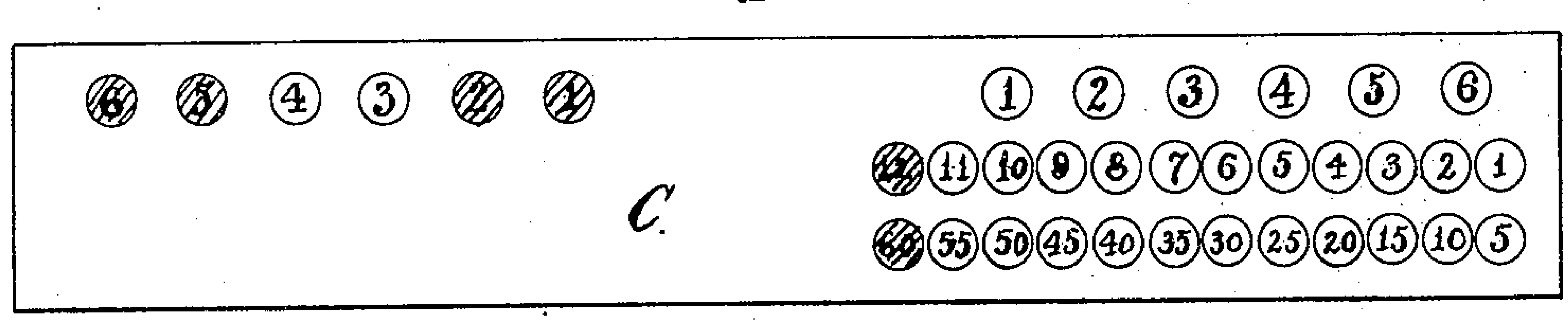


Figure 10.



Witnesses,

Inventor.
Edward Stanley Boynton
by his Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

EDWARD S. BOYNTON, OF BRIDGEPORT, CONNECTICUT.

INFORMATION-TABLET.

SPECIFICATION forming part of Letters Patent No. 258,529, dated May 23, 1882.

Application filed January 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD STANLEY BOYNTON, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Information-Tablets; 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 that class of information-tablets which embody in their construction a number of signs adapted to be displayed at will in various combinations, and of which the combined train-time and station directories used at most of the large railroad-depots are examples. In these information-tablets as heretofore constructed the changes in the combination of the signs are effected by hand, each sign that requires removal or exchange being handled separately. Where these changes have to be made frequently such manipulation of the signs involves the expenditure of a good deal of time and labor, and mistakes are liable to be made.

The object of my invention is to improve these changeable information-tablets by so constructing them that the changes may be made rapidly and with unerring accuracy. To this end the leading feature of my improvement consists of the combination of the signs and a key for automatically displaying a definite selection thereof, such selection of signs being effected either by a separate key or by a change made in a combination-key, if such be used.

I have illustrated my improvement as embodied in a train-time and station directory for railroad-depots, and selected removable flat perforated keys, which, being of the nature of Jacquard cards, I call "Jacquard keys," for effecting the display of the varying selections of signs; and this particular form of my improvement embraces subordinate inventions, consisting of blank keys and special mechanical combinations, relating not only to the mechanism for operating the signs, but also to the mechanism of the train-time indicator, the hands of which are also set automatically and by a key, either by the same which effects the display of the selection of signs or by a separate one.

In the annexed drawings, Figure 1 is a front elevation of my improved information-tablet as embodied in a train-time and station directory. Fig. 2 is a rear elevation of the same without the back casing-plate. Fig. 3 is a vertical transverse section thereof, taken as indicated by the broken lines $x\,x'\,x''$ of Fig. 2. Fig. 4 is a like section, but showing the position of the parts at the time of the removal or insertion of a key. Figs. 6, 7, 8, and 9 are illustrations of the directory, some of which are drawn on an enlarged scale. Fig. 10 illustrates one of the Jacquard keys, also drawn on an enlarged scale.

The same letters of reference indicate similar parts in all the figures.

The various mechanical devices are arranged in and on a case, A, the face or front of which is provided with a time-dial, A′, and two open panels below it, as clearly shown in Fig. 1. In the open panels are arranged two sets of horizontal signs, $a'\,a^2\,a^3\,a^4\,a^5\,a^6$ and $b'\,b^2\,b^3\,b^4\,b^5\,b^6$. In this instance the signs are square wooden bars, on one side of which the name of a station on the road or other information is painted, the other three sides being left blank. The signs are so pivoted on the case that they may be turned through one-quarter of a revolution to expose either the painted side or one of the adjacent blank sides. To each sign is pivoted a pendent rod or tumbler, $c'\,c^2\,c^3\,c^4\,c^5\,c^6$, respectively, the weight of which holds the sign normally in the position shown in Fig. 4, exposing a blank side through the panel. These sign-tumblers depend in a row through holes in the bottom of case A, and they are so graduated in length as to all terminate at one and the same line. The sign-tumblers are pushed up to turn the signs, so as to expose their lettered sides. For this purpose the Jacquard key C—a thin flat strip of suitable material, such as card-board, for instance—is used. A different key is used for each selection of signs to be displayed, the keys being punched at points corresponding to the tumblers of such of the signs as are not to be displayed, so as to allow such tumblers to enter the holes in the key while the rest of the tumblers are being pushed up by the imperforate portion of the key.

In order that the key may be readily and accurately applied to the tumblers, I provide

a movable key-holder, B, attached to the lower ends of guide-rods B′ and B², which pass up into the case and have their upper ends connected by a bar, B³, for a purpose presently to be described. The key-holder is provided with vertical holes registering with the tumblers, and with a recess in its upper side, in which the keys fit pretty snugly. It is constructed with a pull, D, for conveniently moving it up and down, a latch, *d*, being fastened to the stem of such pull for locking the holder to the case after it has been pushed up and the key in it has effected the display of the desired selection of signs.

For the purpose of setting the hands of the train-time indicator simultaneously with the displaying of the signs, I provide the following mechanism:

The hour-hand shaft and the minute-hand shaft are respectively extended into the case, a pinion, *h*, being fixed on the hour-hand shaft and a pinion, *m*, on the minute-hand shaft within the case. Pinion *h* meshes with the teeth on the upper end of the vertical rack-bar H, and pinion *m* meshes with the teeth on the upper end of the vertical rack-bar G. These rack-bars are movable vertically in suitable guides to the extent of turning the pinions *h* and *m* an entire revolution. The lower end of rack-bar H is provided with teeth standing at right angles to the teeth on its upper end and meshing with the pinion *e* on the shaft or cylinder E, which is journaled in bearings on a bar, M, of the case. The lower end of rack-bar G is also provided with teeth standing at right angles to the teeth on its upper end and meshing with the pinion *f* on the shaft or cylinder F, which is journaled in bearings on a bar, N, of the case some distance below bar M. The pinions *e* and *f* are of the same diameter and have the same number of teeth as the pinions *h* and *m*, so that the pinions *h* and *m* will be moved respectively through the same arc through which the pinions *e* and *f* may be moved. The rack-bars pass through a fork on cross-bar B³ on the key-holder guide-rods, and are provided with cross-pins *p p* below said fork. A spiral spring, *s*, encircles each rack-bar between the cross-pin *p* and the bar M of the case, tending to move the rack-bars upward. The extent of the possible movements of the rack-bars is governed by and is in this instance equal to the movements of the key-holder, and the hands of the dial are so arranged that they will both point to the figure XII when the key-holder reaches its lowest position. The movement of the key-holder may be suitably regulated. The hands, if not pointing to the figure XII, are always turned back to that figure by moving the key-holder to its lowest position. The forward movements of the hands due to the resilient action of the springs *s s* on the rack-bars is determined by the Jacquard key and governed by the cylinders E and F and the two rows of vertical tumblers *n* and *o*, which tumblers I call collectively the "time-tumblers," to distinguish them from the sign-tumblers; and to distinguish the set marked *n* from the set marked *o*, I name the former "hour-tumblers" and the latter "minute-tumblers." These time-tumblers are rods the upper ends of which terminate in return-bends. These lower ends pass through and are guided in holes in the bottom of case A. The return-bends of the hour-tumblers pass down through and are guided in holes in the bar M of the case, while the return-bends of the minute-tumblers pass down through and are guided in holes in the the bar N of the case. The return-bends of the hour-tumblers rest on the top of cylinder E in a straight row, and the return-bends of the minute-tumblers rest on top of cylinder F in a straight row. The return-bends of the time-tumblers are distributed over about the whole length of the respective cylinders, at equal distances apart. Each cylinder is provided with a spiral groove, which extends over the whole length of the cylinder and makes one full turn in the length occupied by the row of time-tumblers or their return-bends. One edge of the spiral grooves forms a square shoulder, adapted to be engaged by any one of the time-tumblers, as shown in Fig. 6, to stop the revolutions of the cylinders in the direction in which they are turned by the upward movement of the rack-bars.

It will be observed that by using a row of sixty minute-tumblers the minute-hand may be turned to any minute on the dial by causing the proper minute-tumbler to descend into and engage the shoulder of the spiral groove in cylinder F. I have shown only twelve minute-tumblers and twelve hour-tumblers; but in practice sixty minute-tumblers will be used and a like number of hour-tumblers, so that the hour-hand may be made to indicate the hours and every fifth (twelve minutes) of each hour. The arrangement of the parts is such that when the rack-bars are depressed to their lowest position the hour-tumbler at one end of the row of hour-tumblers and the minute-tumblers at the similar end of the row of minute-tumblers will descend into and engage the square shoulders of the spiral grooves in the cylinders E and F and lock the same, so that the rack-bars cannot be moved up by the resilience of their springs unless these time-tumblers are lifted out of the grooves of the cylinders. When the cylinders are thus locked by the end time-tumblers the hands both point to the figure XII on the dial.

In order to set the hand for indicating any desired time on the dial, I use either the same Jacquard key which effects the display of the signs or a separate Jacquard key properly punched to lift all the time-tumblers except the two—one hour-tumbler and one minute-tumbler—which will lock the cylinders E and F at the moment or moments when the hands have been turned to the proper point or points on the dial. It will be observed that by the time the key has lifted the time-tumblers the cross-bar B³ of the key-holder has reached its high-

est point, so that the rack-bars H and G are free to be moved up from their lowest to their highest position by the resilience of their springs.

In order to cause a gradual expansion and action of the springs *s s* on the hand-setting mechanism, I connect the rack-bars H and G by links *w* to the movable leaves of a pair of independent bellows, V and V′, which are suitably fixed in the upper part of the case A. The bellows are compressed on the depression of the rack-bars, and as they must be expanded on the ascent of the rack-bars the speed of the upward movement of the latter can be regulated by the size of the air-inlet valves of the bellows. Any other known kind of governor may be used in lieu of the bellows.

In practice I propose to furnish for information-tablets operated by Jacquard keys blank keys printed with rings or other marks corresponding to the positions of the several tumblers of the tablet, so that the user may himself punch the blanks to obtain such keys as he may require to enable him to exhibit any information within the compass of the tablet. To facilitate the punching of the blank keys, each ring in the sign-column will be marked with the same information which is on the sign controlled by that part of the key, and each ring in the time-columns will be marked with the time which can be indicated by punching that part of the key. Fig. 10 illustrates such a key, (the rings in the sign-column being numbered,) the rings 1 2 5 6 at the left-hand end of the sign-column and the rings in the time-columns representing the twelfth hour and sixtieth minute having been punched.

The Jacquard key is only one form of key by which a combination of signs may be automatically displayed on an information-tablet; and I do not limit myself in my claims to keys of the Jacquard style unless the key is qualified as such in the claim. Instead of such Jacquard keys, rotatory keys having either perforations or series of bits may be used. Nor do I confine myself primarily to such applications of a key as require intermediate tumblers or equivalent devices for displaying the signs, because the key might be applied to act directly on the signs. On the other hand, the signs might be displayed through the medium of electrical circuits, in which case the key might have the form of a porte-rule for closing the required circuit at one operation and from an office at a distance. The signs might be slid instead of oscillated; or they might be stationary and combined with movable shutters for hiding and displaying them.

Having thus described my invention, what I claim is—

1. In an information-tablet, the combination, substantially as before set forth, of a number of signs and a key for automatically displaying a determinate selection thereof.

2. In an information-tablet, the combination, substantially as before set forth, of a number of signs, a time-indicator, and a key or keys for automatically displaying a determinate selection of signs and setting the hands of the time-indicator.

3. The combination, substantially as before set forth, of the signs and a removable Jacquard key for automatically displaying a determinate selection thereof.

4. The combination, substantially as before set forth, of the signs, the sign-tumblers, and a removable Jacquard key.

5. The combination, substantially as before set forth, of the dial and hour and minute hands, the spring-actuated rack-bars and pinions, the locking-cylinders, the time-tumblers, and a removable Jacquard key.

6. The combination, substantially as before set forth, of the signs, the sign-tumblers, the removable Jacquard key, and the movable key-holder.

7. The combination, substantially as before set forth, of the dial and hour and minute hands, the spring-actuated rack-bars and pinions, the locking-cylinders, the time-tumblers, a removable Jacquard key, and the movable key-holder.

8. The combination, substantially as before set forth, of the spring-actuated rack-bars and pinions and the bellows or governors for governing the resilient action of the springs.

9. An imperforate Jacquard key-blank, (from which Jacquard keys for operating information-tablets of above description may be prepared by perforating the blank at determinable points,) consisting of a strip of card-board or other stiff material provided with marks of a definite number and arrangement, each such mark being designated by a word or letter or numeral (one or more of each) corresponding to the information that may be displayed on the particular tablet for which the blank is designed.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD STANLEY BOYNTON.

Witnesses:
C. A. NEALE,
C. S. HYER.