

No. 808,609.

PATENTED DEC. 26, 1905.

P. LEWITZ.  
WEIGHING SCALE.  
APPLICATION FILED JULY 10, 1905.

2 SHEETS—SHEET 1.

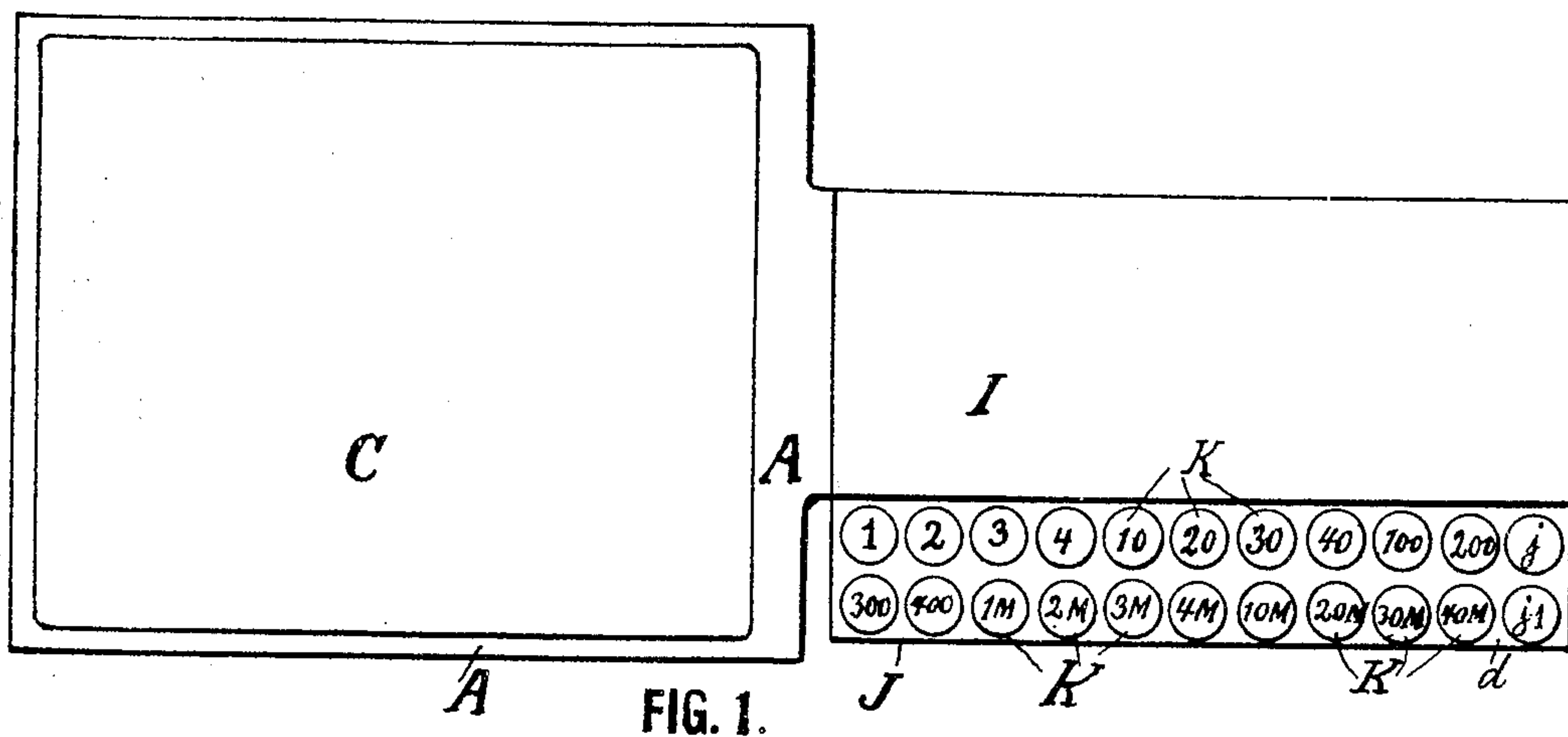


FIG. 1.

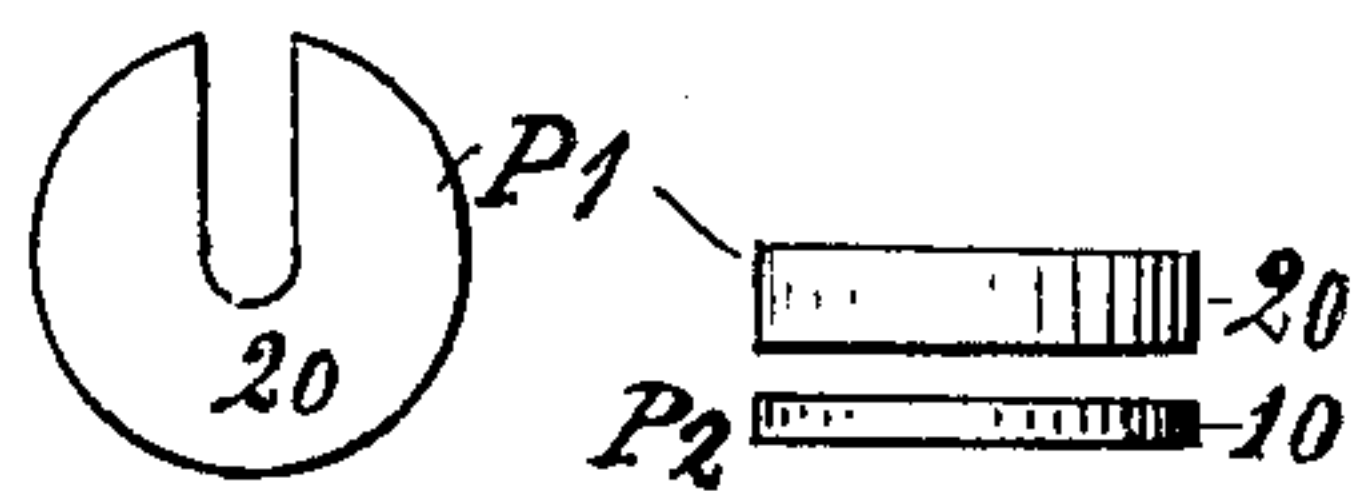


FIG. 4.

FIG. 5.

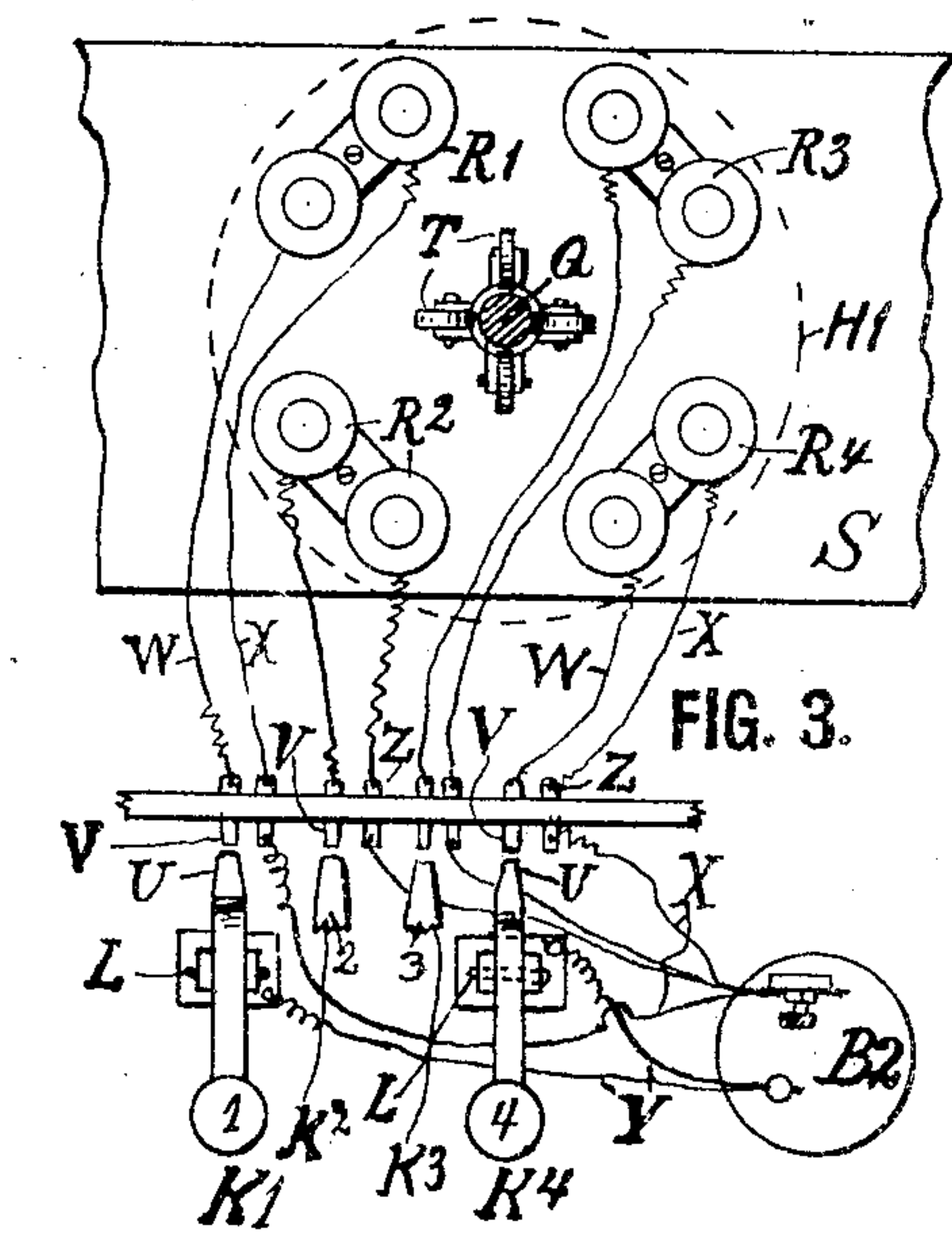


FIG. 3.

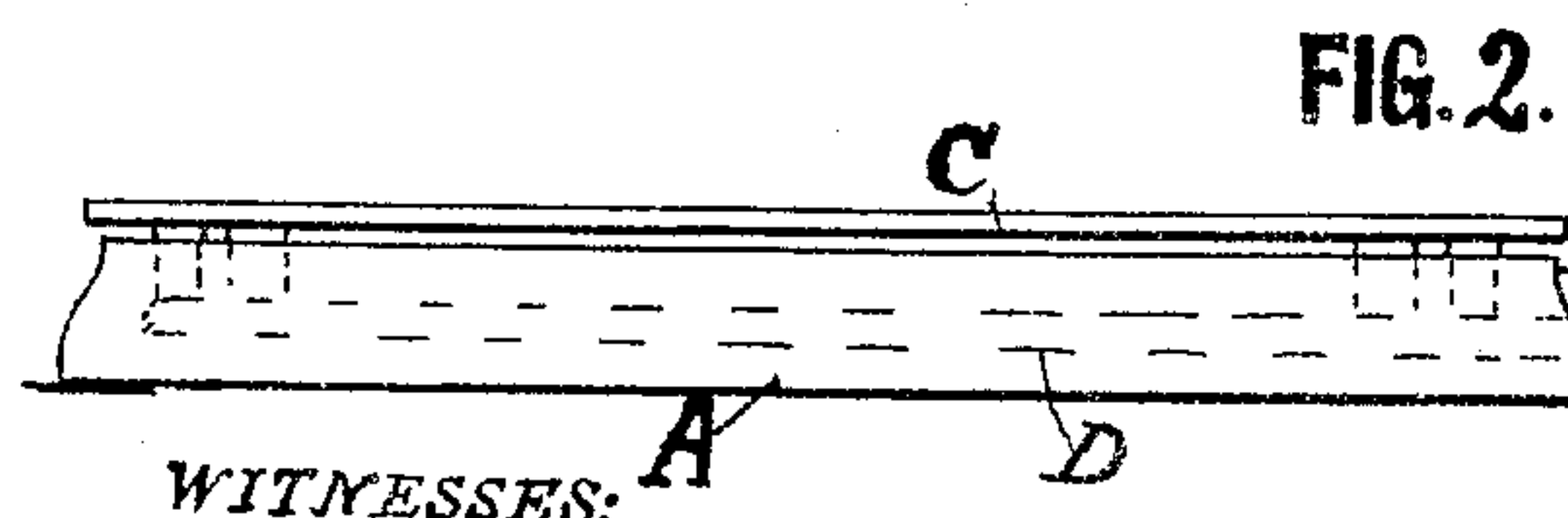
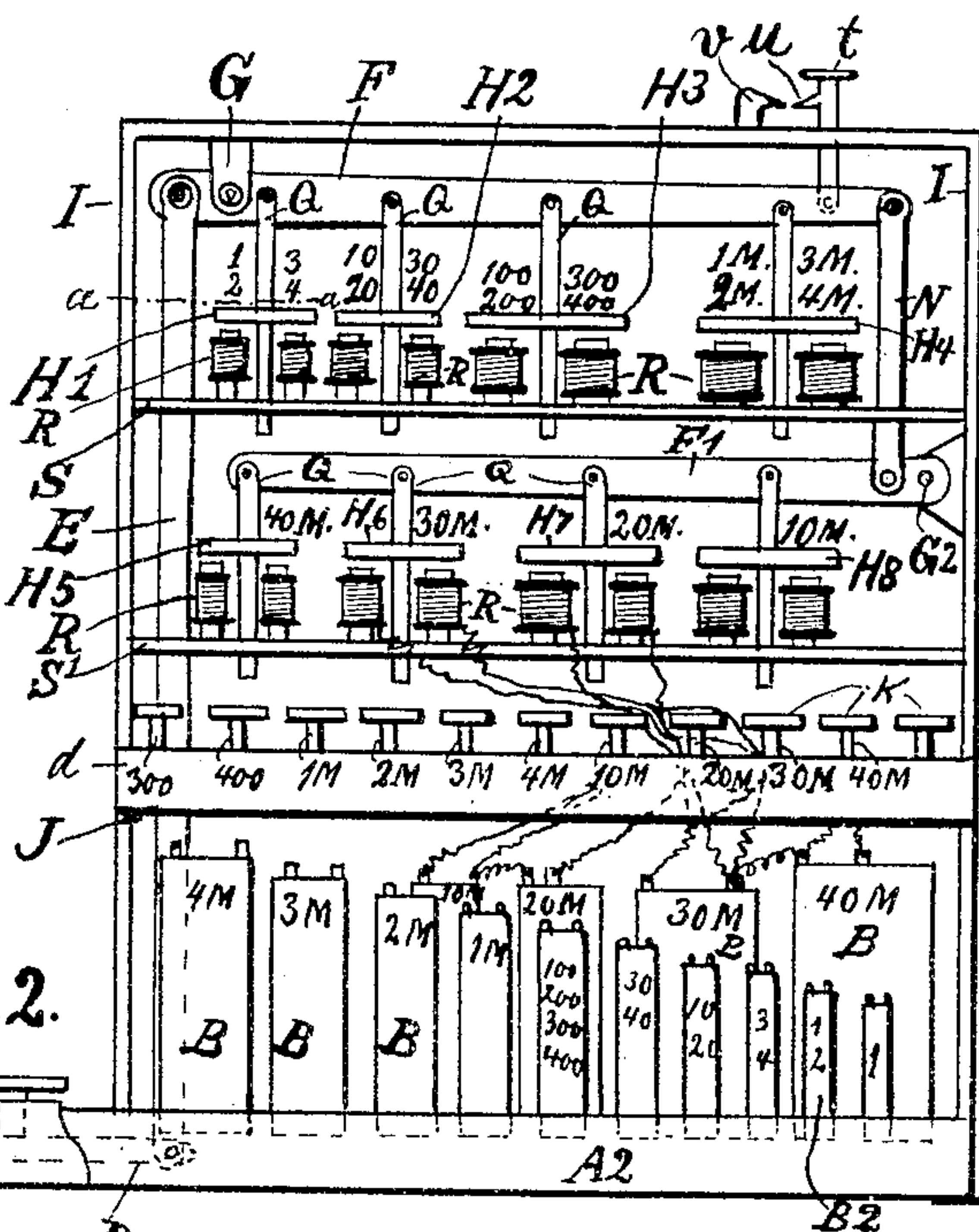


FIG. 2.



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2 SHEETS—SHEET 2.

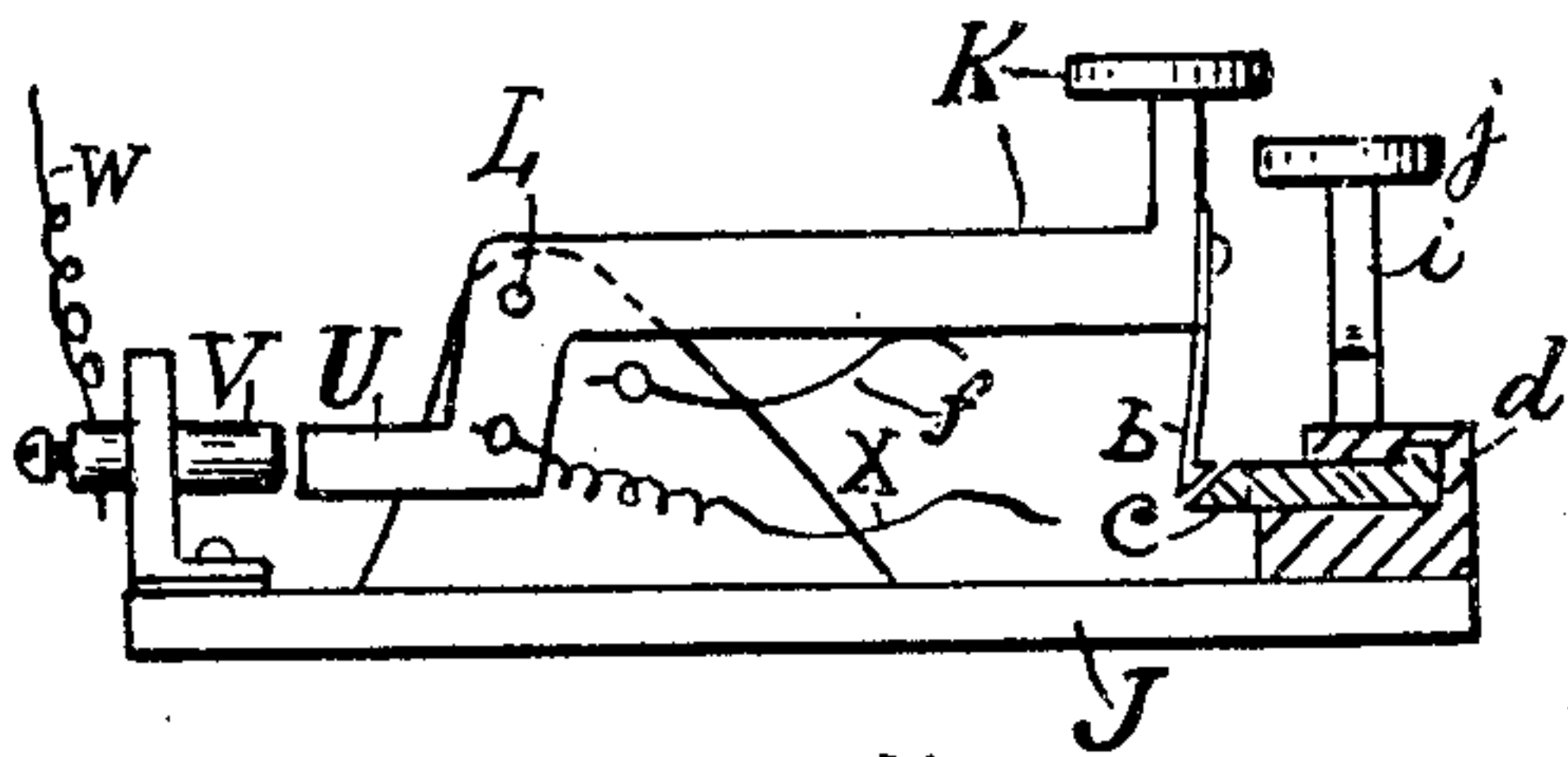


FIG. 7.

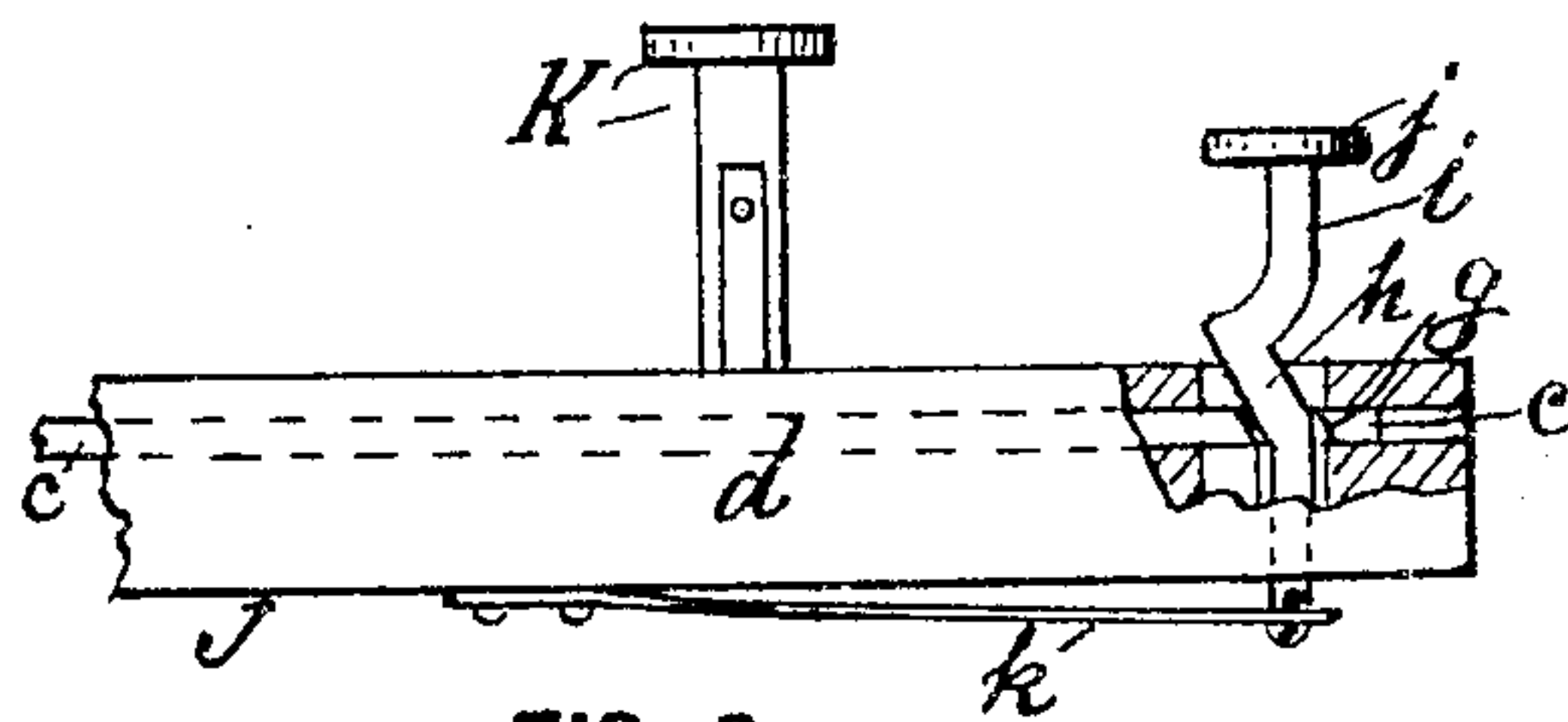


FIG. 6.

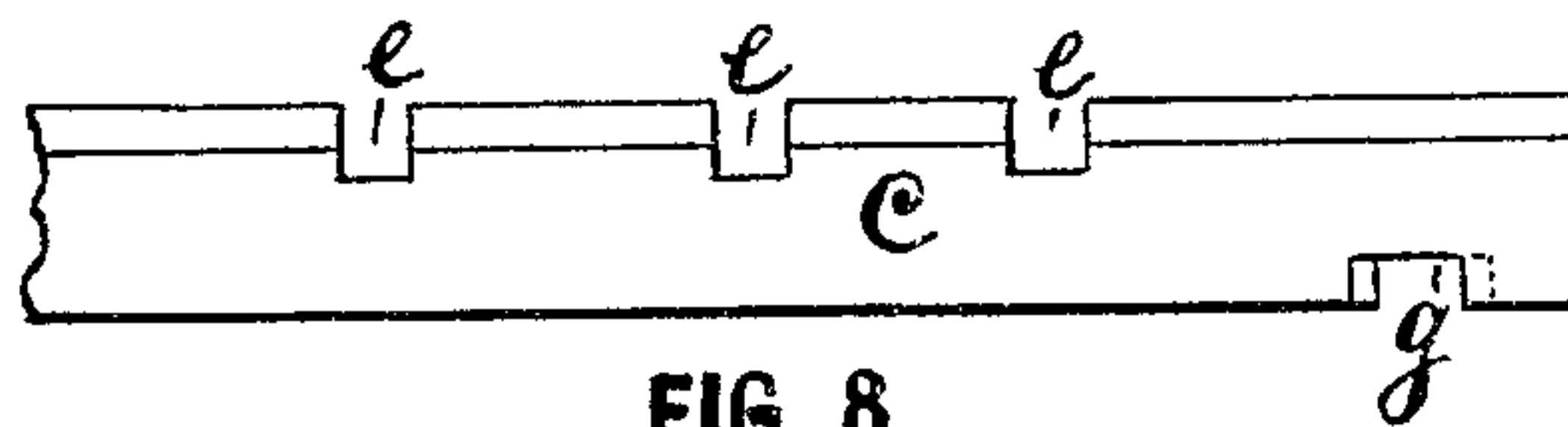


FIG. 8.

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# UNITED STATES PATENT OFFICE.

PETER LEWITZ, OF MINNEAPOLIS, MINNESOTA.

## WEIGHING-SCALE.

No. 808,609.

Specification of Letters Patent.

Patented Dec. 26, 1905.

Application filed July 10, 1905. Serial No. 269,098.

*To all whom it may concern:*

Be it known that I, PETER LEWITZ, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Weighing-Scales; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in weighing-scales; and the objects are, first, to provide a weighing-scale by which bodies or loads of great weight—say all the way from one to one hundred thousand pounds or tons, &c., at a time—may be weighed with the smallest possible number of weights or poises or other means acting as poises; second, to provide an electromagnetically-operated weighing-scale. The first-named object involves a mathematical selection of the fewest possible numbers from which to produce by combination or plain addition the successive numerals or numbers from "1" to "100,000" or as high as it is desired to go, and the second object involves, among other advantages, the avoidance of a serrated or notched scale-beam, with a poise to be moved thereon, which is objectionable both on account of the wear of the serrations or teeth and the aptness to make mistakes in using several beams, platforms, sliding poises, and removable poises, with figures on of different meaning, according to the beam and platform used on the same one scale. These and other objects I attain by the novel construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a top view of a weighing-scale embodying my improvements. Fig. 2 is a side elevation of such scale with side door to the mechanism-chamber I omitted. Fig. 3 is an enlarged sectional top view on the line *aa* in Fig. 2, showing a portion of a supporting-shelf *S* and magnets mounted thereon and a portion of the keyboard or key system, while the plate *H'* is shown only in dotted outline. Fig. 4 is a top view of one of the weights that may be used as poises for this scale. Fig. 5 is an edge view of a small and a large weight of the shape shown in Fig. 4. Fig. 6 is an enlarged portion of the keyboard or box *Jd* in Fig. 2. Fig. 7 is a left-hand end view of Fig.

6. Fig. 8 is a detail top view of a portion of the slide *c* in Fig. 6.

Referring to the drawings by letters of reference, it should be observed that all of the numerals "1, 2, 3, 4, 10, 20, 30, 40, 100, 200, 300, 400" mean that many pounds and "1M," "2M," "3M," "4M," "10M," "20M," "30M," and "40M" mean one thousand, two thousand, &c., "M" standing for the word "thousand," said numerals all indicating so many pounds to be weighed.

All electric press buttons or keys are marked *K K' K''*, &c. Poises are *P' P''*, &c. Poise-holders are *H H'*, &c., and electric batteries are *B B'*, &c., and when any of those elements are marked the same number of pounds it indicates that they are used together in weighing such number of pounds except as hereinafter explained.

*A* designates the base or lower frame, and *C* the platform, of a weighing-scale of somewhat common construction, so that the lever mechanism *D*, rod *E*, and beam *F* need no detail description. The beam *F* is suspended by a bracket *G* from the top of the box or chamber *I*, provided upon the extension *A'* of the base. In this chamber is arranged all the mechanism and means by which the beam *F* is operated, and in front of the chamber is arranged a keyboard *J*, on which are pivotally mounted at *L* the keys *K*, by which the weighing is done when electricity is used, as is hereinafter more fully described.

In order to be able to weigh heavy loads with short beams, I arrange in the large sizes of the scale a second beam *F'*, pivoted at *G'* and connected by a link *N* near its fulcrum to the end of the beam *F*, so that by using the lower beam or lever the lifting power transmitted to the platform *C* is so greatly multiplied that but comparatively small poises or magnets will operate the beams. From each beam are pivotally suspended a series of rods *Q*, each provided with an iron plate *H' H''*, &c., used as supports for weights similar to those in Figs. 4 and 5, or they may act as the loads to be attracted by a series of electric magnets *R*, fixed upon shelves *S S'*, one below each beam. Said rods *Q* are guided in holes in the shelves, preferably between antifriction-rollers *T*. (Shown in Fig. 3.)

As it is not practical on the limited space afforded by patent drawings to show the relative sizes of magnets, wires, and batteries, nor to properly proportion any of the parts of the scale, it can only be here described that



the magnets, wires, and the batteries B are of such varied and relative capacity as to create magnetic force enough to pull down the plate or plates H, to which the current is directed, and then lift at the platform C the number of pounds indicated upon such of the keys K as is used to establish connection between the battery and the magnet, due regard being had to leverage gained by the location of the rod Q on the beam or beams used. Some of the batteries operate only one of the poise-plates H, while others may operate several magnets alternately or together, or several batteries are brought to act upon the magnets under a single poise-plate. Such varied connections, as well as the simplest connection between batteries and magnets, are but partly indicated in Fig. 2, while in Fig. 3 is given a fair idea of how the poise-plate H' may be pulled down by the battery B<sup>2</sup> and weigh either one, two, three, or four pounds on the platform C by using, respectively, the magnets R' R<sup>2</sup> R<sup>3</sup> R<sup>4</sup>, which are of the required different power and will act when receiving current by pressing one of the keys K' K<sup>2</sup> K<sup>3</sup> K<sup>4</sup> down so that their contact-point U touches the plug V and completes a circuit over the wires W X Y. The intermediate plugs Z are used for convenience of connection, but may be dispensed with. The batteries B are preferably arranged in the lower part of the chamber and are held steady by standing in pits provided for them in the base.

In Figs. 6, 7, and 8 is shown how each key K has a spring-hook *b*, adapted when the key is depressed into contact with V to catch below the edge of a flat bar *c*, sliding in a suitable guide *d*, fixed to the keyboard. This bar is provided with notches *e*, (see Fig. 8,) through which the hooks *b* will raise to their normal position as soon as the slide is in such a position that the spring gets a chance to raise the key-lever. The slide *c* is moved longitudinally by having a notch *g*, engaged by an inclined portion *h*, of a vertically-moving stem or slide *i*, having a push-button *j* at its top and at its lower end connection with a spring *k*, holding the button or key normally elevated. In Fig. 1 can be seen two such keys *j* and *j'*, indicating that the weighing-keys may be arranged in two rows, one for small and one for extra large weights, operating the upper and lower beams, respectively, and may be released, one by the key *j* and the other by the key *j'*.

In the operation or use of the scale if the article or goods on the scale is supposed to weigh from three hundred to four hundred pounds the operator presses down the button or key marked "300," then key "40," then "20," and so on the keys of the smaller numbers until the scale balances, when he adds the number of pounds indicated on all the keys pressed down, and the sum is the weight in pounds of the goods on the scale. When

the weighing is done, or whenever a key is pressed down that indicates more than the goods on the scale, the key or keys are released by pressing on the button *j* or *j'*, so that all other keys are free to assume their normal position, the notches *e* being presented to the hooks *b*.

It will be readily seen that by combining the twenty numbers used on the keys any number from "1" to "100,000" will be obtained. Thus, for example, the numbers "5," "6," "7," "8," and "9" are obtained by using the lower numbers "2" and "3," "1" and "2" and "3," "3" and "4," "1" and "3" and "4," "2" and "3" and "4," respectively, and in similar manner the tens, hundreds, thousands, and tens of thousands are obtained until the one-hundred-thousand limit is reached. For small scales the keys required may be held down by the fingers without using the hooks *b*.

Where it is convenient to get electricity from a dynamo or other electric wire, the batteries may be dispensed with, and where the electricity is not desired or available poises or weights similar to those in Figs. 4 and 5, or any other suitable form, may be used upon the plates H H' H<sup>2</sup>, &c., and should be marked, respectively, numbers increasing in the order shown on the keys in Fig. 1.

In Fig. 2, *t* is a feeler or push-piece by which the operator may feel if the scale is nearly balanced and will thus be able to more easily apply the lacking keys K to fully balance it. Combined with said push-piece is an indicator *u*, which by its position to the pointer *v* shows whether the scale is balanced or not.

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

1. In a weighing-scale, the combination with the scale-beam of a series of poise-rods suspended therefrom, iron plates secured on said rods, electromagnets of various capacities arranged below the plates, electric batteries of various strengths connected with the magnets, keys inserted in the circuits and marked with numbers representing units of weight in the following order: 1, 2, 3, 4, 10, 20, 30, 40, 100, 200, 300, 400, 1000, 2000, 3000, 4000, 10,000, 20,000, 30,000, 40,000, &c.

2. In a weighing-scale, the combination with the scale-beam of a series of poise-rods suspended therefrom, iron plates secured on said rods, electromagnets of various capacities arranged below the plates, electric batteries of various strengths connected with the magnets, keys inserted in the circuits and marked with numbers representing units of weight.

3. In a weighing-scale, the combination with the scale-beam of a series of poise-rods and plates suspended therefrom, iron plates secured on said rods, electromagnets of various capacities arranged below the plates, electric batteries of various strengths connected with



the magnets, keys inserted in the circuits and marked with numbers representing units of weight, said numbers being such that when properly combined they will produce all the successive numbers from one to the highest number to be weighed on the scale.

4. In a weighing-scale, the combination with the scale-beam of a series of poise-rods and plates suspended therefrom, iron plates secured on said rods, electromagnets of various capacities arranged below the plates, electric batteries of various strengths connected with the magnets, spring-elevated keys inserted in the circuits and marked with numbers repre-

senting units of weight, said numbers being such that when properly combined they will produce all the successive numbers from one to the highest number to be weighed on the scale, and automatic means for holding said keys down, and means for releasing the depressed keys, substantially as set forth.

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

PETER LEWITZ.

Witnesses:

E. H. BORNHOLZ,  
CHARLES V. WHITE.