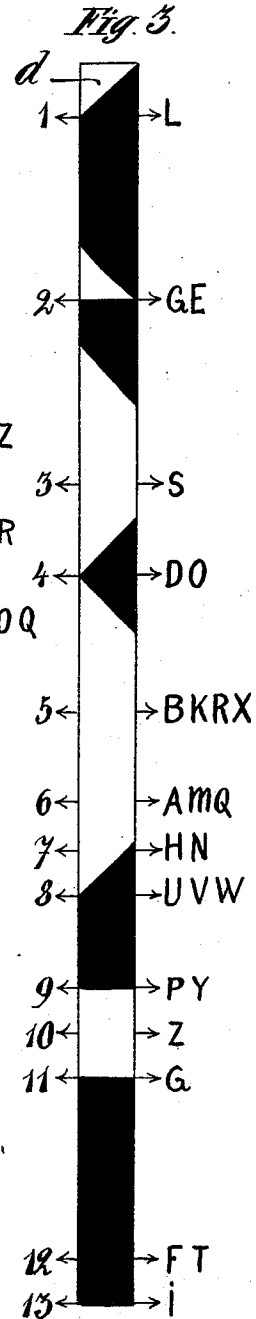
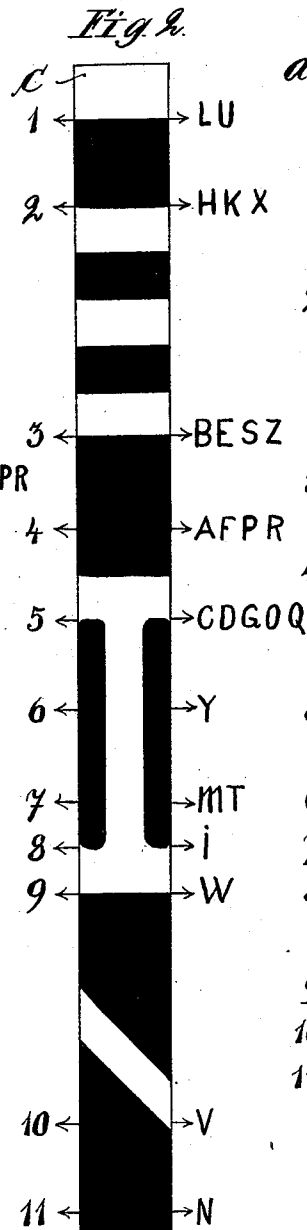
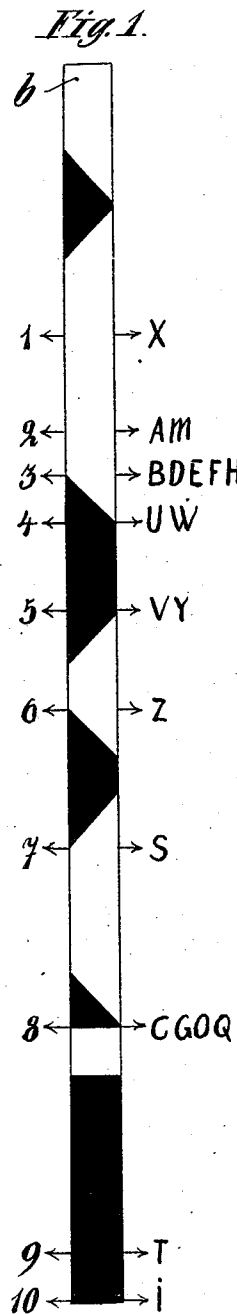


1,046,042.

Patented Dec. 3, 1912.

3 SHEETS-SHEET 1.



Witnesses:
 E. W. Moore.
 H. E. Chalkley.

Inventor:
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DISPLAY SIGN.

APPLICATION FILED OCT. 17, 1910.

Patented Dec. 3, 1912.

1,046,042.

3 SHEETS—SHEET 2.

Fig. 4.

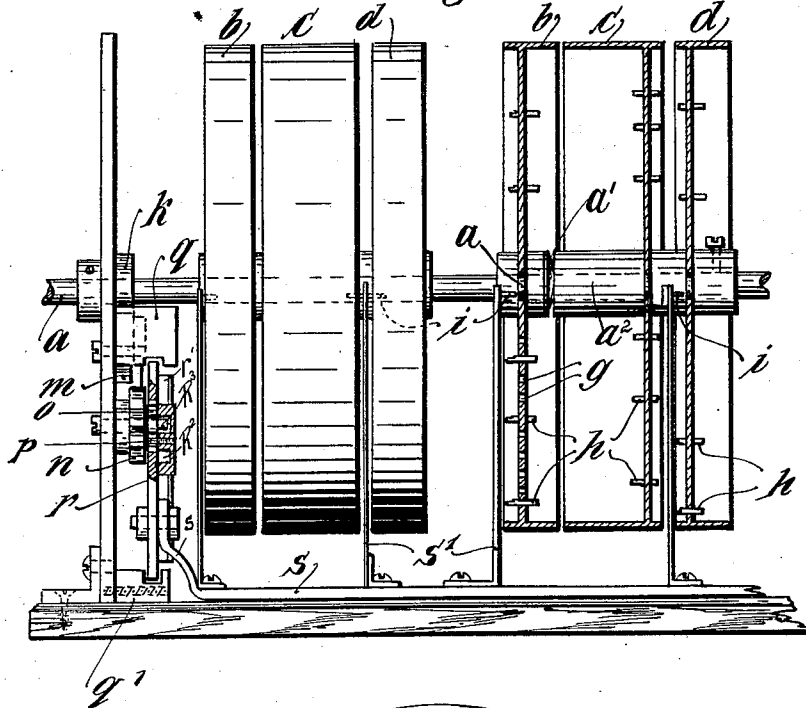
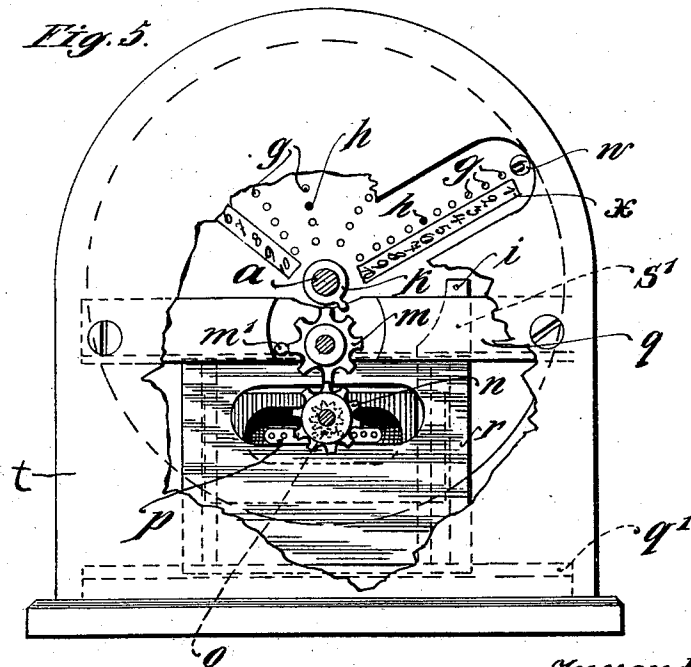


Fig. 5.



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E. W. Moore.
L. E. Barkley.

Inventor:
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att'y.

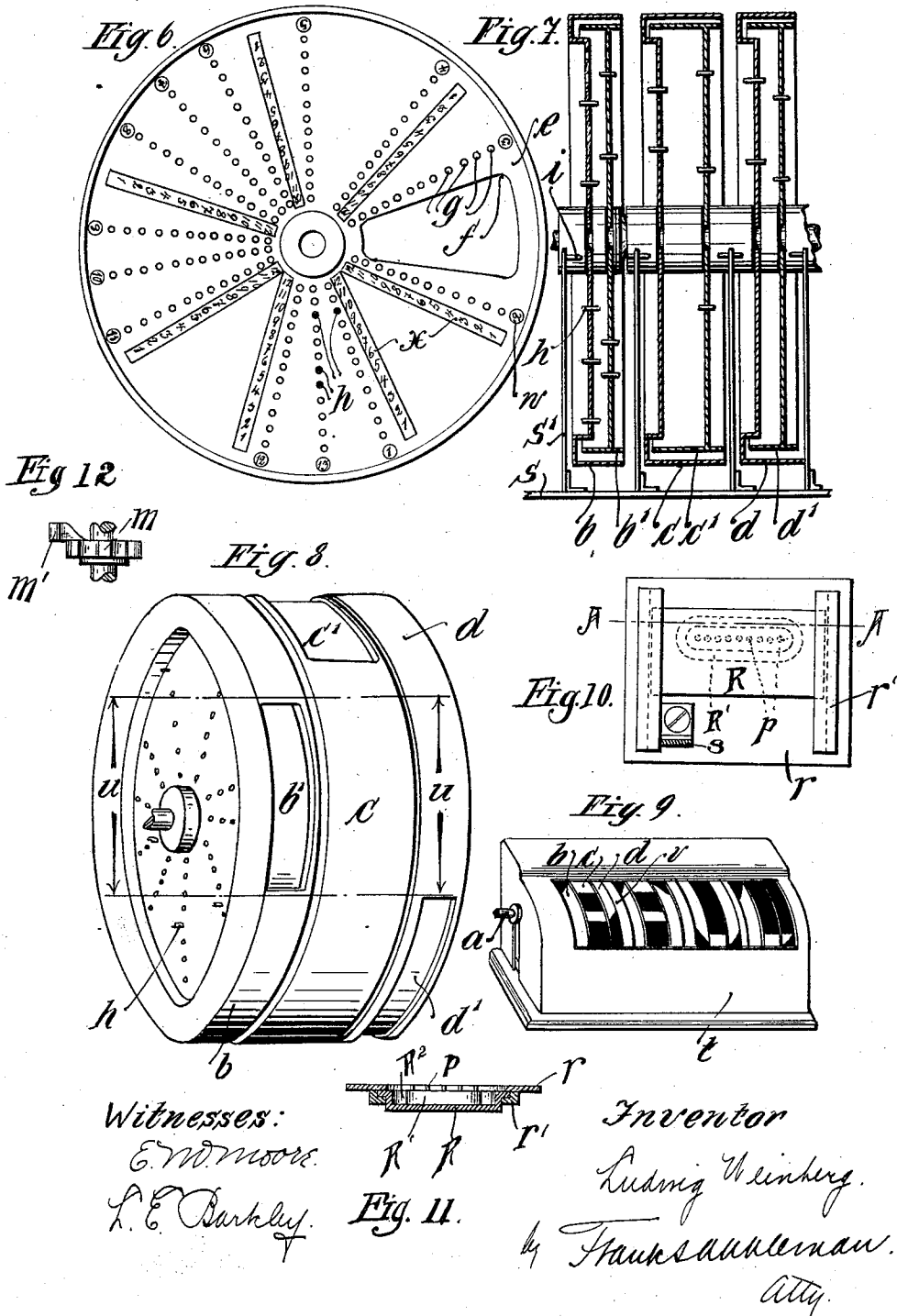
L. WEINBERG.
DISPLAY SIGN.

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3 SHEETS—SHEET 3.

1,046,042.



UNITED STATES PATENT OFFICE.

LUDWIG WEINBERG, OF SCHÖNEBERG, NEAR BERLIN, GERMANY.

DISPLAY-SIGN.

Specification of Letters Patent.

Patented Dec. 3, 1912.

1,046,042.

Application filed October 17, 1910. Serial No. 587,634.

To all whom it may concern:

Be it known that I, LUDWIG WEINBERG, a subject of the German Emperor, residing at 6 Kaiser Friedrichstrasse, Schöneberg, near Berlin, Germany, have invented certain new and useful Improvements in Display-Signs, of which the following is a specification.

Arrangements for showing signs, letters, words, pictures and the like are known in various designs. With these each object of demonstration is contained as a whole on picture band rolls, single sheets, disks and the like which may be made visible either in day light or at nights by artificial light. An arrangement is also known, in which a separate compartment is provided, which is divided into a given number of small fields of various shapes, each of which is fitted with a glow lamp. By simultaneously illuminating certain fields these will together form letters, so that all letters may be produced one after the other in each compartment and by using several compartments next to each other, any word may be produced. This arrangement has the disadvantage, that it can be used at nights only with artificial light, and remains ineffective all day long.

The present invention relates to an arrangement for producing letters, figures and the like combined with a connecting and change arrangement for producing words and the like at will; it differs essentially from the known arrangements for the same purpose by the fact that it may be very effectively used also at day light. The present arrangement allows of being used for roof advertisement as well as on a small scale for show windows; in the same advantageous manner it may be employed for signaling for military, naval, railway purposes, places of amusement and the like.

The arrangement is exemplified in the accompanying drawings in two constructional forms.

Figures 1-3 are the face bands of the wheels with the signs forming the letters. Fig. 4 is a side view, the guard cover being removed in part section. Fig. 5 is a front view with front wall partly broken away. Fig. 6 is a side view of a wheel with stop pins. Fig. 7 is a section through a group of double wheels. Fig. 8 is a perspective view of the same. Fig. 9 is a perspective view of the complete apparatus. Fig. 10 is a

detail, in elevation, of the plate *r* and cross-head *R*, as viewed from the right of Fig. 1; and Fig. 11 is a sectional detail view, taken on the line A—A of Fig. 10. Fig. 12 is a detail plan view of one of the gear wheels.

By dividing the single letters of the alphabet by horizontal and vertical cuts into two, three or more parts it is possible to use the thereby obtained section of one letter for producing a number of other letters, so that the number of signs required is much smaller than the number of letters to be produced. The number of these signs may be further reduced by combining corresponding sections to one sign. This is particularly facilitated by the signs being arranged on an annular band, say on the circumference of a wheel, as the human eye is able to encompass about one third of the circumference of a wheel at a glance. If the letters are in such a manner vertically divided into three sections the bands *b*, *c*, *d* shown in Figs. 5-7 are produced with the signs of which all letters of the Latin alphabet can be produced. The arrows on the bands indicate the points from which within a given distance upward the respective letters marked thereupon will be formed. So for forming the letter "P" the arrow 3 on band *b* must be in a level with arrow 4 on band *c* and arrow 9 on band *d*; for forming the letter "A" the arrows 2, 4, 6 must correspond, for the letter "U" the arrows 4, 1, 8, for the letter "L" the arrows 3, 1, 1. This is illustrated in Fig. 1. It is evident that with such arrangement, as shown in Figs. 1, 2 and 3, the band *b* is used at ten, band *c* at eleven and band *d* at thirteen points; the three bands combining for forming all letters of the alphabet; bands *b* and *d* being of equal width but not as wide as *c*. If all three bands are to be made equal width or if only two or more than three bands are to be used for each letter, the forms of the signs, and also their number and the number of times each band is used will vary accordingly.

The bands *b*, *c*, *d* are preferably arranged as shown in the one constructional form on the circumference of disk wheels, so that for forming each letter a set of three such wheels will be required arranged close to each other on a spindle.

According to the other constructional form illustrated in the drawings and for the

purpose of obtaining the letters produced of a larger size without increasing the size of the apparatus, as it may be of importance for roof advertisements, the signs for each band are enlarged and each band is divided into two parts, each of which is secured to the flange of a disk wheel. The flanges of these wheels are arranged within each other and the flange of the outer, larger wheel is cut out in the size of the letter to be produced, so that the band beneath it is visible through the opening thus produced.

The number of wheels in each group is thereby doubled so that in place of sets of three wheels each, there will be sets of six wheels each. All these wheels are likewise mounted on one common spindle. The flanges of the six wheels are not all next to each other; there will be three each outer flanges b, c, d , and three each inner flanges b', c', d' in the same level.

For consecutively producing with each set of bands the various letters in any series a stop and change gear is required, which for operating the constructional forms shown is suitably made as hereinafter described.

On a spindle a such sets of wheels b, c, d or b, c, d and b', c', d' respectively are mounted next to each other in a number corresponding to the number of letters to be produced (Fig. 4). These sets of wheels are covered by a casing t , in which in front of each set apertures u with webs v are provided. These apertures correspond in width with the said sets and in height with that of the letters, so that of each band only so much will be visible, as is necessary for the production of a letter and all other signs will remain covered (Fig. 9).

The width of the face of the wheels corresponds with the width of the bands b, c, d they are to carry. In the constructional forms shown the wheels are shown as disk wheels (Fig. 4). In each disk e is provided a number of radial rows of holes w . The number of such rows differs with each wheel; wheel b has ten rows, wheel c eleven rows, wheel d thirteen rows. Therefore one row of holes corresponds with each arrow on the bands b, c, d . The distance between the several rows are likewise not equal but correspond to the distances between the arrows. The bands b, c, d may therefore not be indiscriminately fixed to the wheels, but the number of the arrows must be made to correspond exactly with the numbers of the rows of holes. The number of holes g is the same in each row and in each wheel and corresponds to the number of words to be composed consecutively by the whole arrangement. In the present instance twelve different words can be composed. Into these holes stop pins h are inserted or screwed (Figs. 4 and 5). For allowing this to be done in the central disk a recess f is pro-

vided in one of the other disks, through which recess the pins h may be reached.

If double wheels $b b', c c', d d'$ are employed, the ten rows of holes in the single wheels b, c, d are divided over both wheels $b b', c c', d d'$ respectively.

The spindle a is continuously revolved by means of a suitable driving gear. The wheels or double wheels are not fixed on the spindle but loose on the same, so that they will rotate with the spindle, when not retained. It is therefore essential that there should be a certain amount of friction between said wheels and said spindle. Any proper means may be employed for providing this friction; but the means here shown consists of spring disks a' of ordinary construction interposed between the hubs a^2 of the disks. The wheels are retained in the position required for forming the letters by means of arresting pins i , against which the stop pins h in the rows of holes w will abut. The arresting pins i are fixed on supports s^1 which are arranged on a common bar s . A support s' may be used for each wheel, but a support with two arresting pins i may also be employed to serve two wheels. The bars s may be arranged at any point parallel to the spindle a . In the constructional form under discussion it is arranged beneath the wheels, and coupled to one or two slides r , which are arranged in sliding adjustment in guides q and q^1 at the ends of the apparatus. To the slide r is coupled in known manner a vertically adjustable horizontal rack p , in the teeth of which a gear wheel o engages, which is rotatably fitted to the end wall of the casing. Next to the gear wheel o another gear wheel n is positively arranged, into which a single tooth m^1 engages provided on the side of a gear wheel m arranged over gear wheel n . Into the gear wheel m engages the cam of the cam-shaft k rigidly secured to spindle a .

The arrangement and its single parts operate as follows: On each disk twelve pins h are screwed for composing twelve words in such a manner into the rows of holes, that one pin is in each of the twelve concentric circles formed by the holes of the several rows. According to the series in which each of the twelve words appearing consecutively is to appear, the pins are inserted into the one, two, three rows of holes and so on. Say the word "Paul" is to appear first; then the pins must as hereinbefore explained, be inserted in correspondence with the numbers of the arrows in the first set of wheels for the letter "P" into the rows three, four, and nine, in the second set of wheels for letter "A" into rows two, four, and six, in the third set for "U" into rows four, one and eight, and in the fourth set for "L" into rows three, one and one, in all instances in the circle marked one. If this

word is to appear as the seventh only, the pins are inserted into circle seven and so on. It can by such means be controlled in what series the words appear. The slide *r* would

5 be standing at its extreme position, so that the arresting pins *i* stand exactly opposite the first row of holes, and will here arrest the wheels, turned by the rotation of spindle *a*. The spindle thereupon revolves farther
10 and at each revolution it will by means of cam *h* advance the gear wheel *m* by one tooth, which will on completion of each revolution advance gear wheel *n* by one tooth by means of tooth *m*¹, so that by action of
15 the gear wheel *o* the rack *p* will be moved back by one tooth. In consequence thereof the arresting pins *i* will be moved by slide *r* and slide *s* out of the range of the first row of holes and release the stop pins *h*,
20 and finally stand in the range of the second row of holes. All wheels will revolve until the stop pins *h* inserted in the second row of holes are arrested by the pins *i*. During the rotation of the wheels the various signs
25 will move past the windows in the casing, producing a singular effect, very suited to attract the attention of the passers-by.

After the rack *p* has been moved to the extreme point of its travel it is raised by
30 gear wheel *o* in known manner, so that the latter will now pass beneath it and the rack will be moved in the opposite direction.

The plate *r* is provided with guides *r'*, between which a cross-head *R* is mounted
35 to reciprocate vertically. The cross-head *R* is provided with an elongated boss *R'* surrounded by an endless channel or race *R*² in which a stud *R*³, concentric with the wheels *n* and *o*, has relative movement. As
40 the wheel *o* rotates, it moves the rack horizontally until one of the circular portions of the channel, by its engagement with the stud *R*³, coacts with the wheel *n* and one of the teeth *p*, for raising the cross-head, or
45 alternately lowering it, and thereby shifting the rack alternately between the upper and the lower cogs, respectively, of the wheel *o*. The alternating motion thus obtained, imparts a horizontally reciprocating motion
50 to the plate *r* and to the members *s*, *s'* and *i*.

What I claim as my invention and desire to secure by United States Letters Patent is:

1. Arrangement for displaying notices for advertising signaling purposes and the like,
55 comprising disk wheels loosely mounted on a common spindle, means for rotating said disk wheels, sections of characters on the circumference of said wheels, which sections will at given predetermined positions complement each other to produce characters,
60 each of said sections being part of a character, means for arresting said wheels at given predetermined positions and means for varying such arresting action.

65 2. Arrangement for displaying notices for

advertising and signaling purposes and the like, comprising disk wheels of different diameters and the smaller rotating within the larger loosely mounted on a common spindle, means for rotating said disk wheels, sections of characters on the circumference of
70 said wheels, which sections will at given predetermined positions complement each other to produce characters, each of said sections being part of a character, the said sections being distributed in further sections
75 on the flanges of the two wheels of different diameter, certain of the flanges having apertures, corresponding in size with the sections of characters on other of the flanges, 80 means for arresting said wheels at given predetermined positions and means for varying such arresting action.

3. Arrangement for displaying notices for advertising signaling purposes and the like,
85 comprising disk wheels loosely mounted on a common spindle, means for rotating said disk wheels, sections of characters on the circumference of said wheels, which sections will at predetermined positions complement
90 each other to produce characters each of said sections being a part of a character, arresting pins, radial rows of holes in each of said disk wheels adapted to receive stop pins corresponding with the characters on the circumference and adapted to abut at predetermined positions of the wheels against said
95 arresting pins, and means for varying the position of such arresting pins.

4. Arrangement for displaying notices for
100 advertising, signaling purposes and the like, comprising disk wheels loosely mounted on a common spindle, means for rotating said disk wheels, sections of characters on the circumference of said wheels, which sections
105 will at predetermined positions complement each other to produce characters each of said sections being part of a character, arresting pins, radial rows of stop pins carried by the disk wheels and corresponding with the
110 characters on the circumference and adapted to abut at given positions of the wheels against said arresting pins, a bar carrying said arresting pins, a gearing consisting of gear wheels, a rack and a slide driven from
115 the said spindle and adapted to intermittently change the position of the bar and its arresting pins with respect to the stop pins and throughout the range of one row of stop pins, said bar on completing its travel in one
120 direction being returned in a similar motion and again alternately arresting the various rows of stop pins.

5. Arrangement for displaying notices for advertising, signaling purposes and the like,
125 comprising disk wheels loosely mounted on a common spindle, means for rotating said disk wheels, sections of characters on the circumference of said wheels, which sections will at predetermined positions com- 130

plement each other to produce characters,
each of said sections being part of a character,
arresting pins, radial rows of stop means
carried by the disk wheels and corresponding
5 ing with the characters on the circumference
and adapted to abut at given positions of
the wheels against said arresting pins, a bar
carrying said arresting pins, a gearing consisting
of gear wheels and a rack, a slide
10 driven by the said spindle and gearing; and
means for intermittently changing the posi-

tion of the bar from the range of one row of
stop members to that of another row, in alternate
directions, being returned continuously to its starting point.

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

LUDWIG WEINBERG.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."