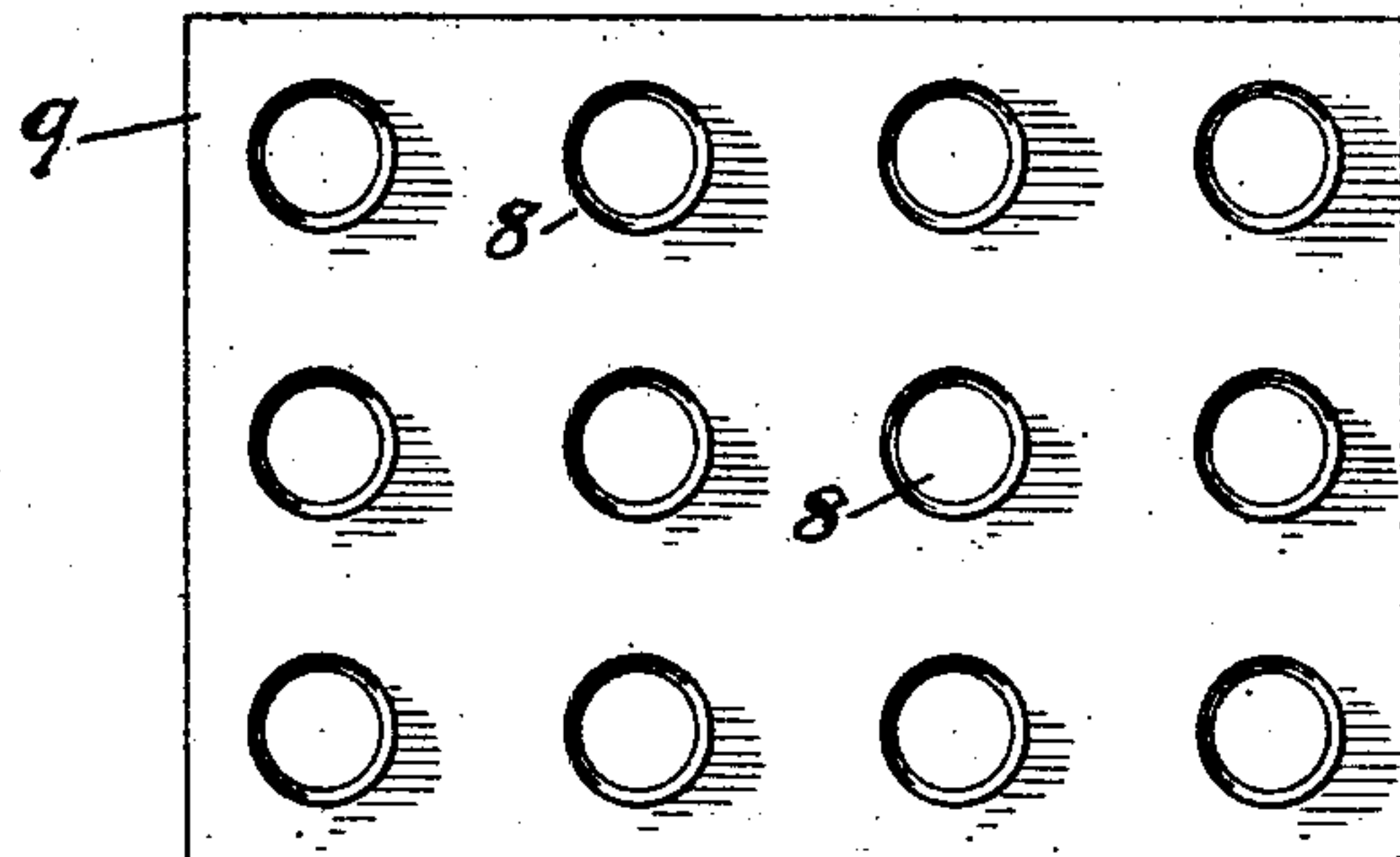
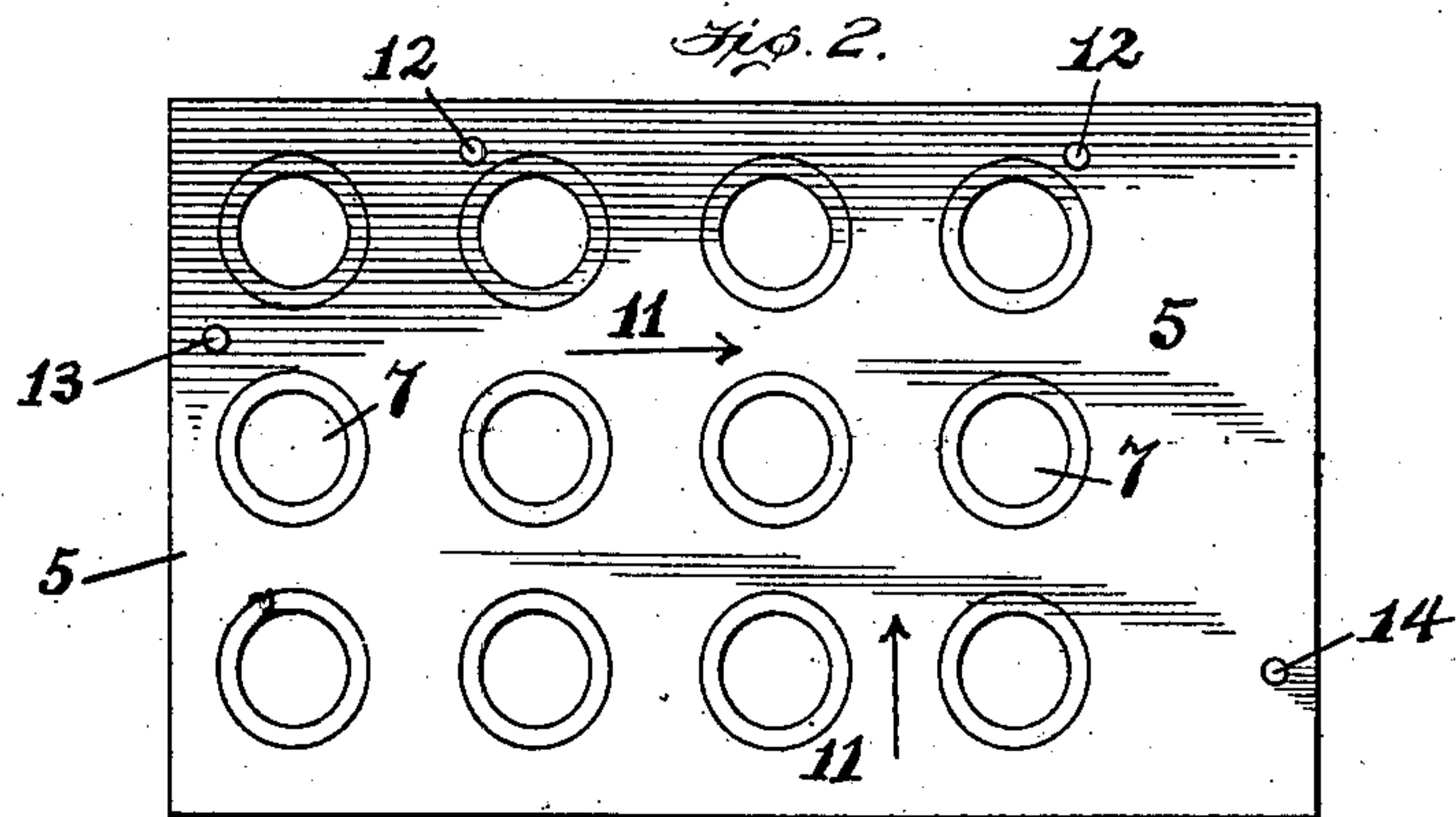
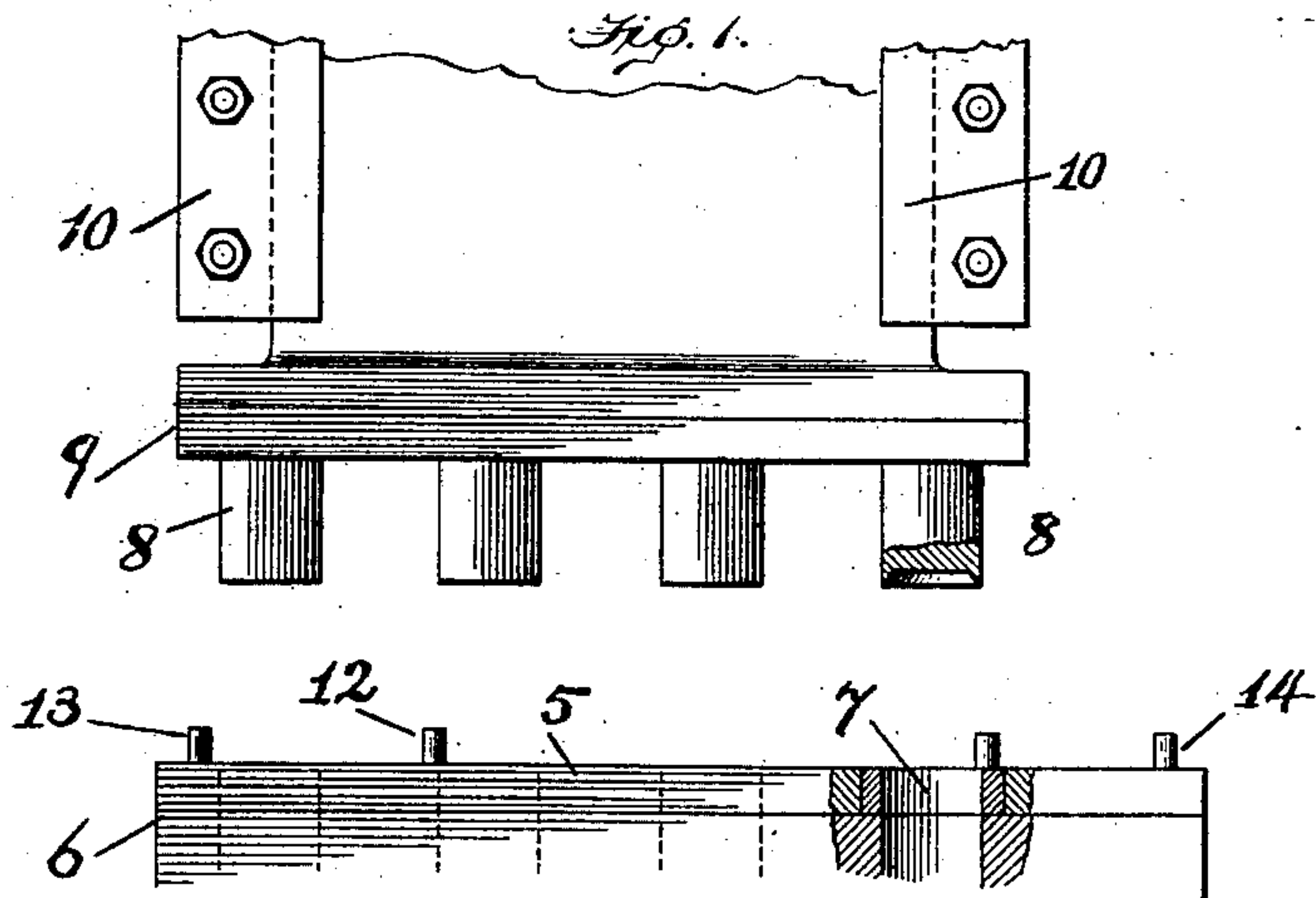


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GANG DIE FOR CUTTING SHEET METAL BLANKS.
APPLICATION FILED MAR. 20, 1908.

915,042.

Patented Mar. 9, 1909.

3 SHEETS—SHEET 1.



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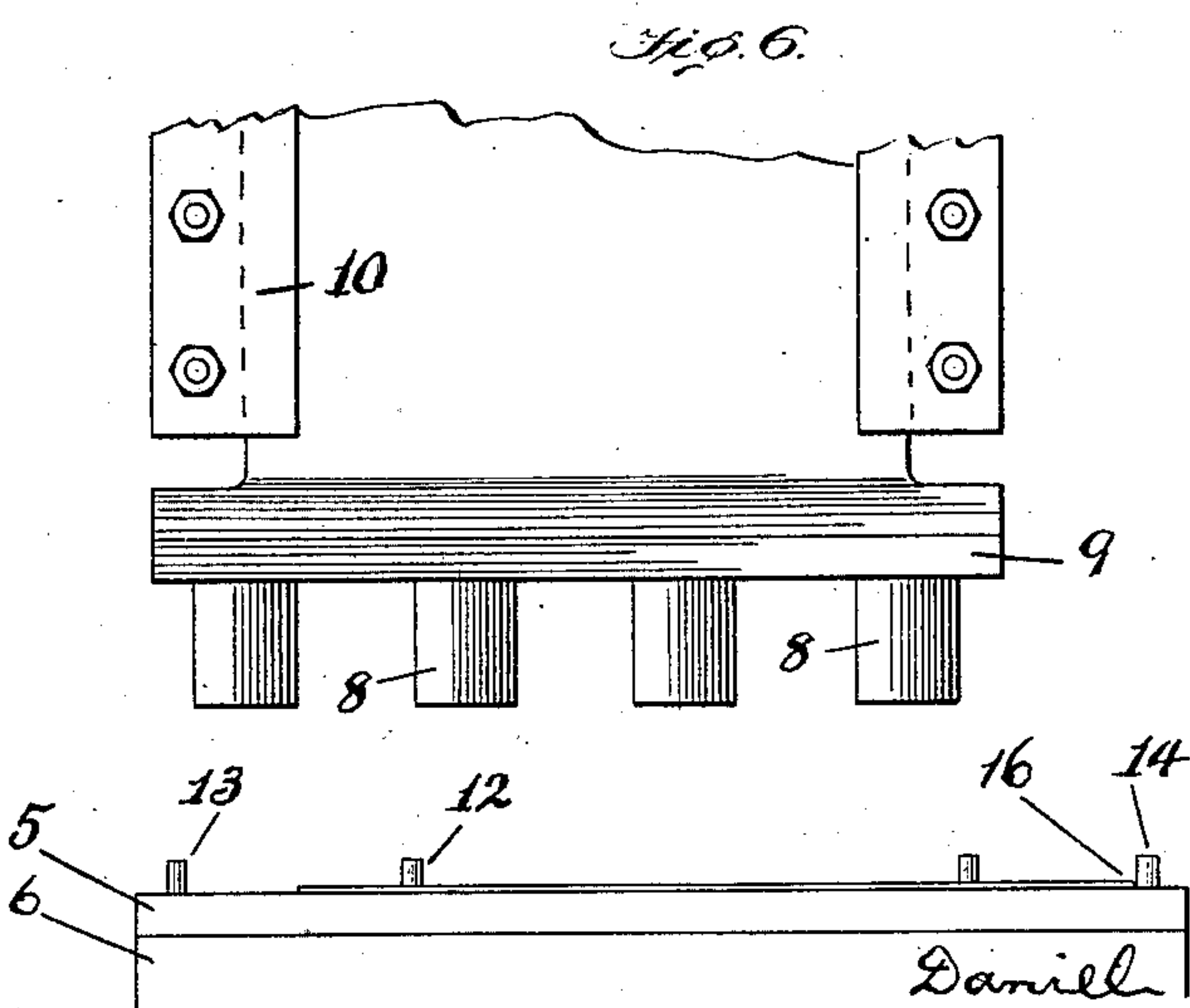
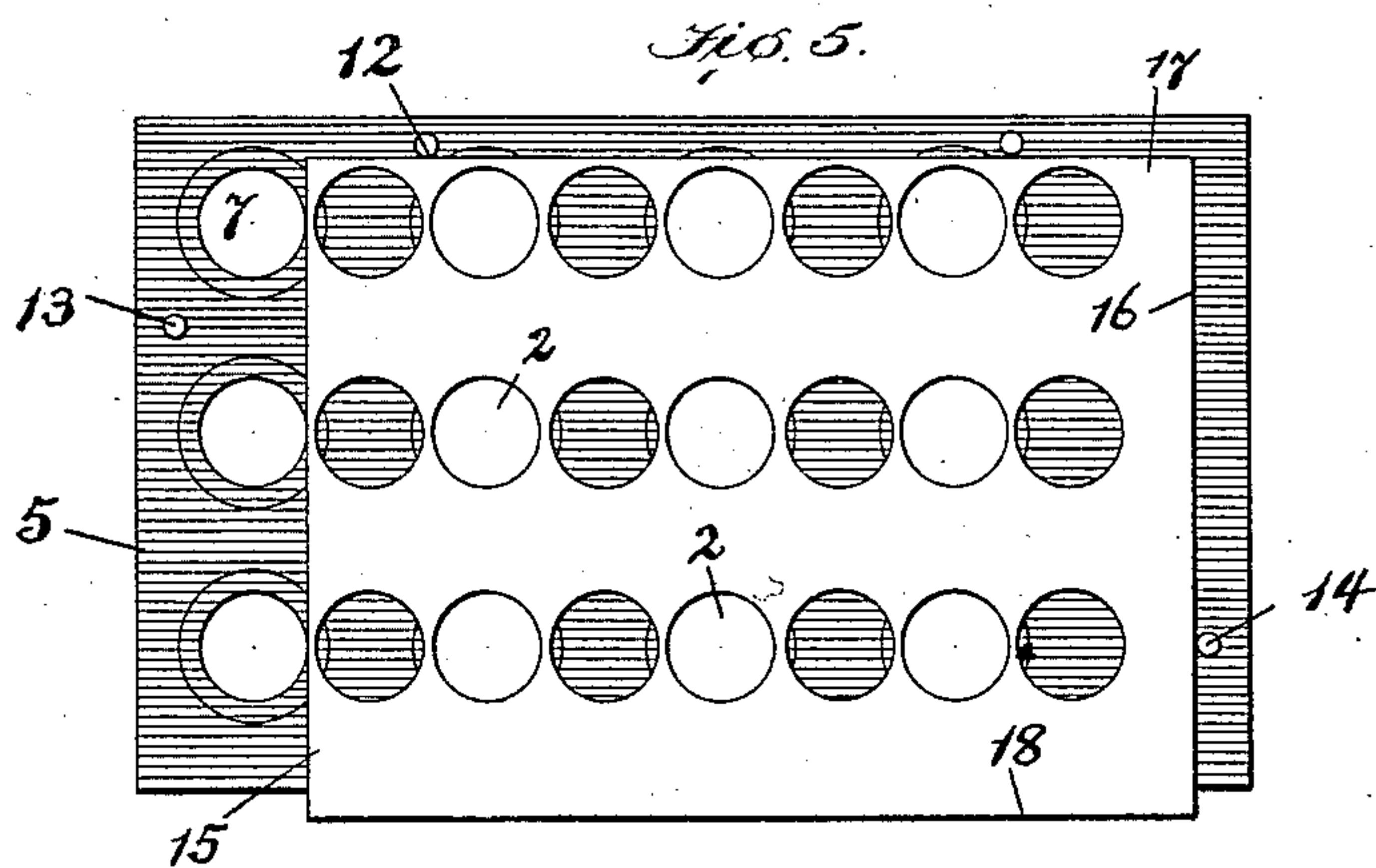
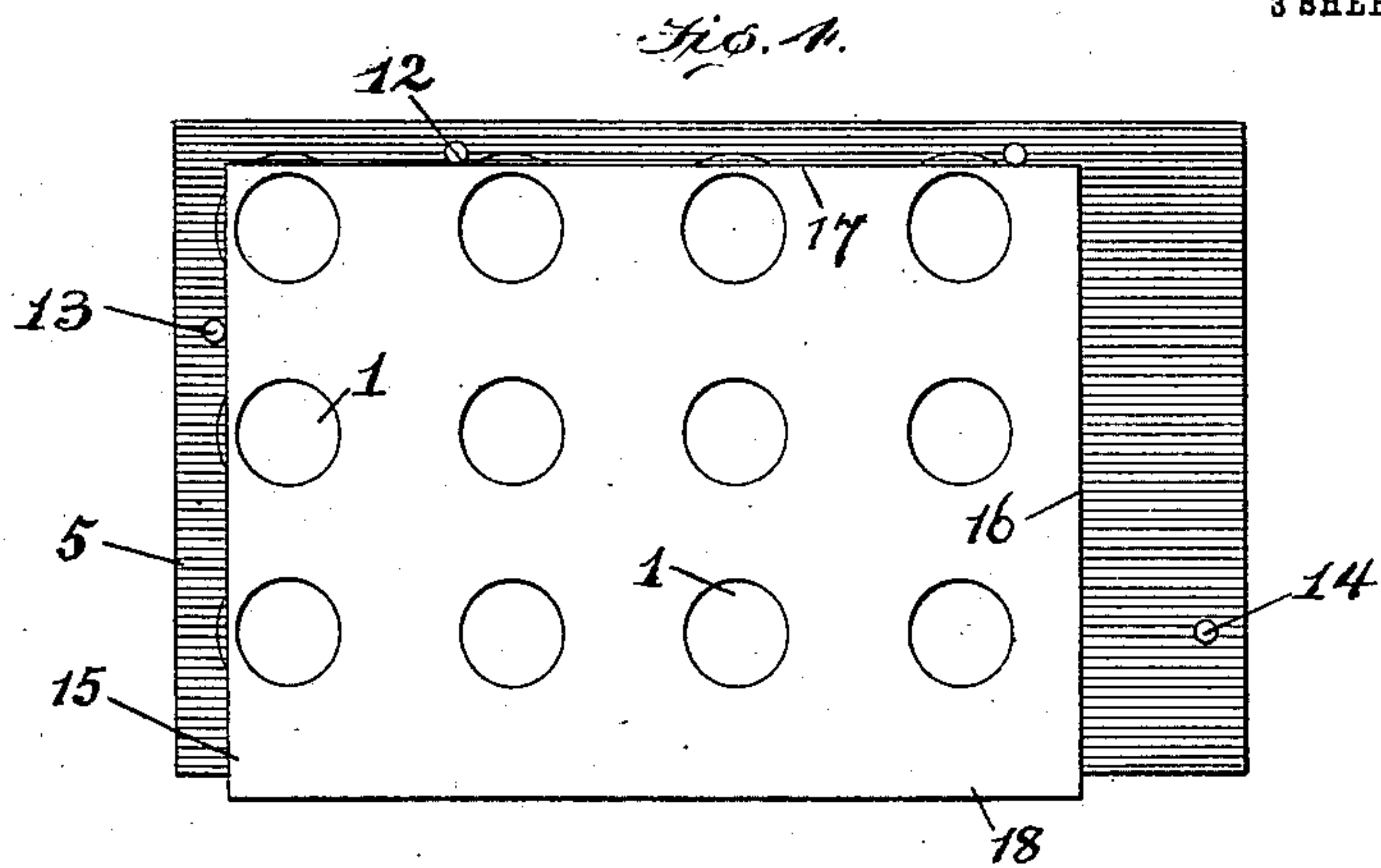
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 7.

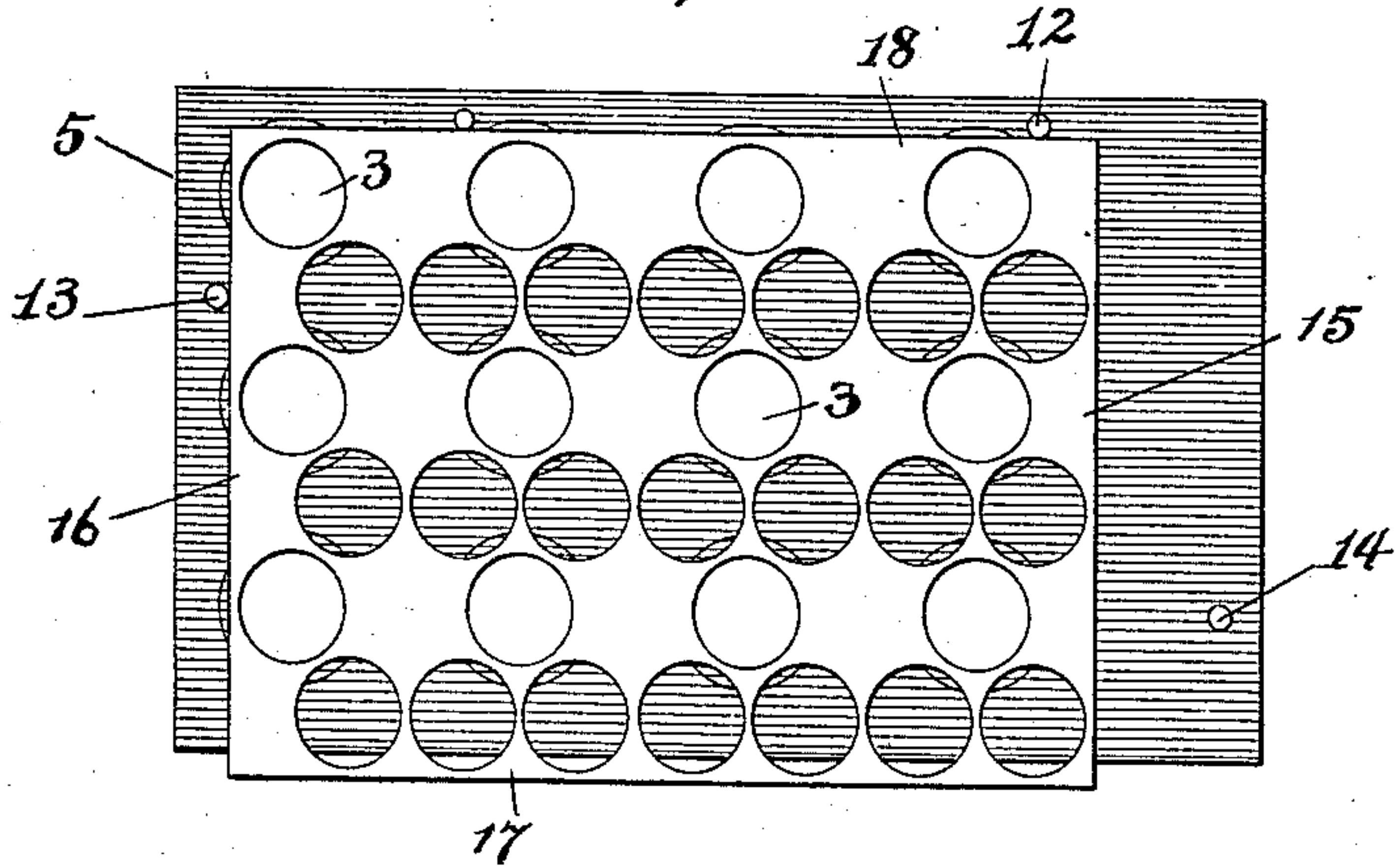


Fig. 8.

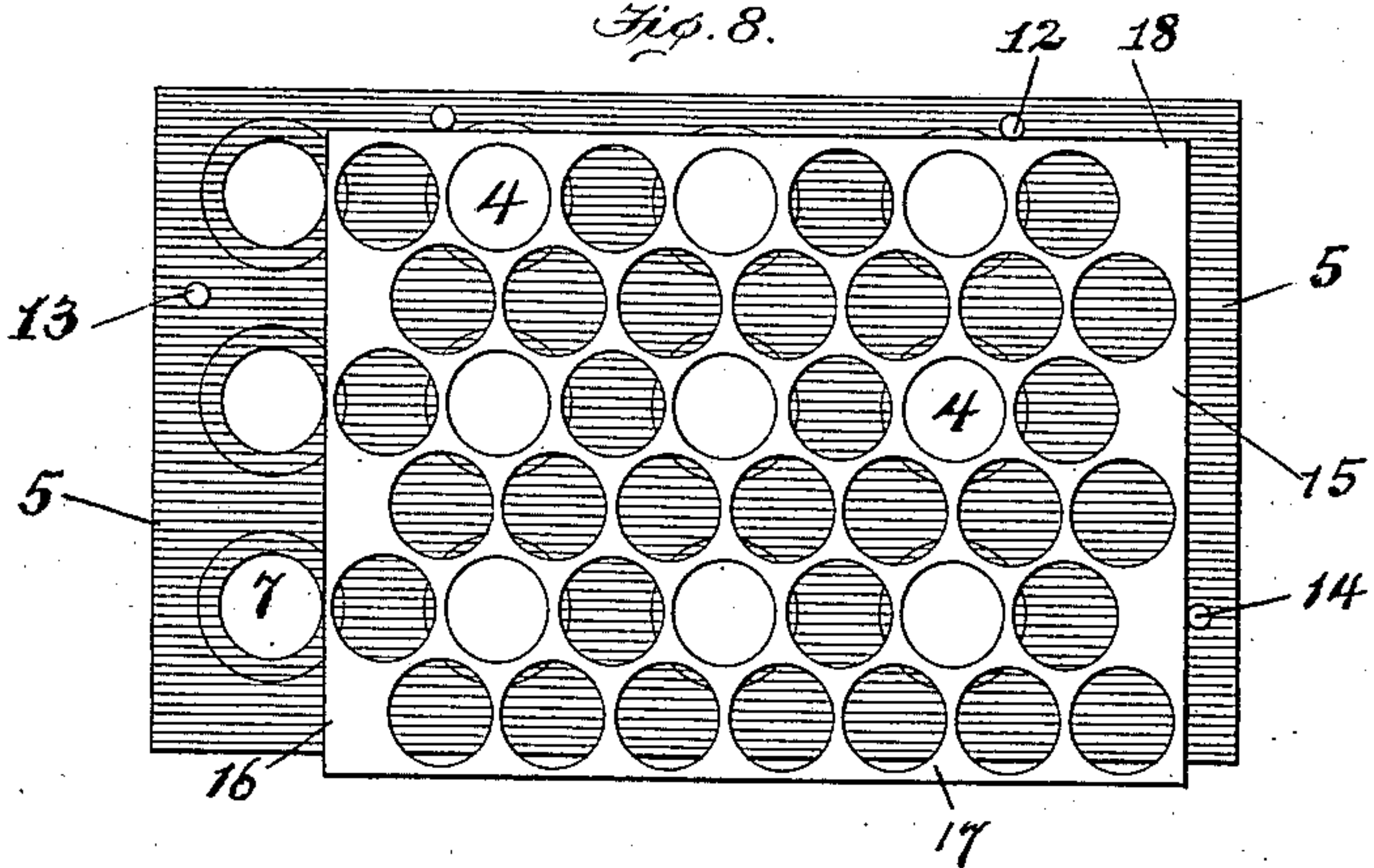
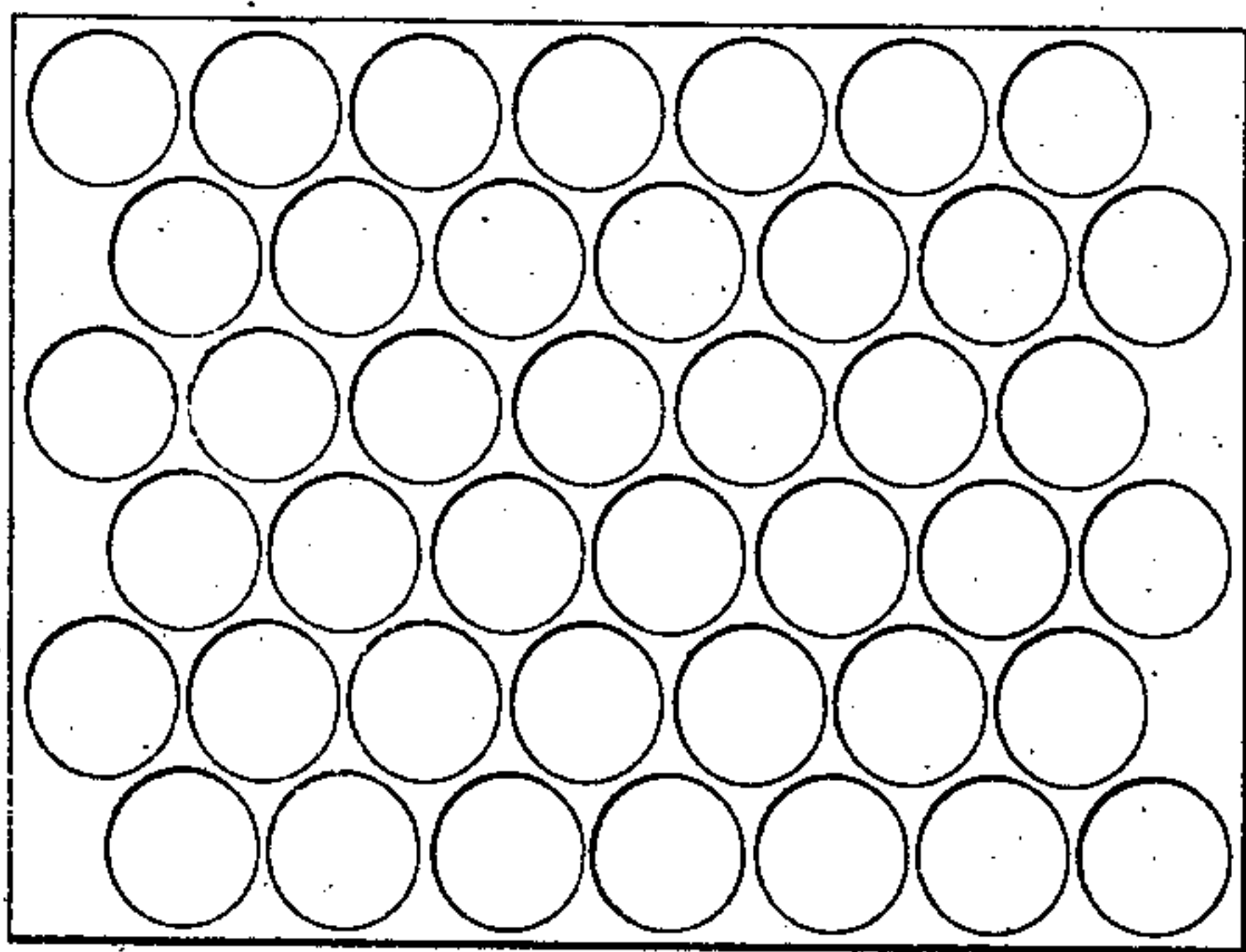


Fig. 9.



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UNITED STATES PATENT OFFICE.

DANIEL P. ROBINSON, OF BALTIMORE, MARYLAND, ASSIGNOR TO CONTINENTAL CAN COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION OF NEW JERSEY.

GANG-DIE FOR CUTTING SHEET-METAL BLANKS.

No. 915,042.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed March 20, 1908. Serial No. 422,225.

To all whom it may concern:

Be it known that I, DANIEL P. ROBINSON, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Gang-Dies for Cutting Sheet-Metal Blanks, of which the following is a specification.

This invention relates to improvements in gang dies the punches of which make repeated strokes to cut disks from a sheet of tin-plate. The tin-plate disks referred to are such as are used as tops and bottoms in the manufacture of tin cans.

In the operation of cutting disks from a plate of sheet-metal where a number of dies are employed,—the set of dies being termed “a gang”—the punches of all the dies comprising the gang are required to make repeated strokes, and for each stroke of the punches the metal sheet must be presented in a position changed from that which it had at the last stroke.

The object of the present invention is to provide gang dies and gages specially related to opposite ends of said gang dies, to govern the several positions of the sheet of tin-plate relative to the dies, so that at each succeeding stroke of the die-punches the sheet of tin-plate will be certain to have the changed position desired. The resultant advantage of this improvement is to obtain with the least cost for labor the largest possible number of disks of given size from a sheet of commercial tin-plate of standard size, which is 20x28 inches.

The present invention consists in combining with a gang of dies whose several members shall be suitably grouped or disposed on the bed plate and head plate, two gages each one so related to the opposite end of said gang of dies, that the sheet of metal that is to be operated on may be governed, at one stroke of the die-punches by one gage, and then at the next stroke of the said die-punches governed by the other gage.

In order to assist to an understanding of this improvement reference is made to the accompanying drawing in which,

Figure 1 is a front elevation of a set of gang dies,—all the die-punches being elevated ready to make a stroke. Fig. 2 is a top view of the plate to which is secured that part of all the dies which receive the punches,

commonly called the female part of the die. Fig. 3 is an inverted or bottom view of the head plate which carries all the die-punches of the gang. Fig. 4 is a top view of the bed-plate having the female dies, and showing a sheet of tin-plate resting thereon and governed by the gage at one end of the gang of dies and in the position required for the first stroke of the punches, which have cut circular perforations designated, 1. Fig. 5 is a similar view of the bed-plate and female part of the dies, showing the same sheet of tin-plate governed by the gage at the opposite end of the gang of dies and in the position required for the second stroke of the punches. The circular perforations in the plate cut by this second stroke are in number less than all the dies of the gang and are designated, 2. Fig. 6 is a front elevation of the gang of dies showing the sheet of tin-plate in the same position it has in Fig. 5, and the punches raised after having made the second stroke. Fig. 7 is a view of the bed plate having the female dies and shows the same sheet of tin-plate in a position for the third stroke of the die punches; the sheet has been revolved, or changed end for end, and the dies have cut a third series of disks the perforations being designated, 3. Fig. 8 is a top view of the female dies and the same sheet of tin-plate in a position changed from the last stroke and from which has been cut a fourth series of disks—a number less than all the dies of the gang. The perforations are designated, 4. Fig. 9 shows the remnant of the same sheet of tin-plate from which have been cut the largest possible number of disks of the size in question.

In the present case a gang of dies, twelve in number, is employed to cut the particular size of disks indicated from a sheet of tin-plate of standard size, which is 20x28 inches. The largest possible number of disks of this size that can be cut from a sheet of standard size, is forty-two. These figures are here given only for the purpose of facilitating an understanding of the explanations herein made, and it is to be understood, therefore, that the particular sizes, or the particular number of disks, or the particular number of dies comprising the gang, are not essential. It is also to be understood that any kind of a stamping press may be used, and the individual dies are of the well-known construction used in punch-

ing disks for ends of tin-cans and comprise two parts—a punch part, and a block having a hole to receive the said punch.

The bed-plate, 5, of the gang dies rests on the platen, 6, of the press, and the female parts, 7, of the dies are suitably secured to said bed-plate; the die-punches, 8, of the gang are removably secured to the head-plate, 9, and are carried up and down in the guides, 10, of the press. The several dies, each composed of the parts, 7, and, 8, are grouped or disposed relative to each other on the plate to which they are secured in straight lines in two right-angled directions, and there being the same number of dies in all the lines that extend in the same direction; also this grouping of the dies as shown in Figs. 2 and 3 forms on the said plates open spaces that extend in two sets of straight lines, shown by the darts, 11, in two right-angled directions. At the back of the gang of dies one or more gages or stops, 12, are secured which project upward high enough for the edge of the tin-plate to abut against and govern the position of one edge of the tin-plate at every stroke of the punches.

I provide two independent gages or stops, 13, 14, of which one is secured adjacent each end of the gang of dies, and are so related to opposite ends of the gang of dies that the sheet of tin-plate that is to be operated on by the said dies, may be governed at one stroke of the die-punches, by the gage at one end of the gang, and then at the next stroke of the die-punches governed by the gage at the opposite end of the gang. In other words the two independent gages are operative alternately,—when the gage at one end is governing the sheet of tin-plate the gage at the other end is out of service. For the purpose of distinguishing the respective end and side-edges of the sheets in their changed positions as shown in the drawings during the several punching operations, the two end-edges of the sheet are marked, respectively, 15, and, 16, and the side-edges thereof are designated, 17, 18.

The operator who feeds the sheet of tin-plate to the stamping press, takes the sheet in his hands and presents it in the present instance below all the punches of the entire gang of dies, with the side-edge, 17, of the sheet against the back gage or stop, 12, and with the end-edge, 15, of the sheet against the left-hand gage or stop, 13. The operator then causes a stroke of the gang of punches to be made; in this first stroke all the dies of the gang are effective. Inasmuch as the gang in the present instance comprises twelve dies, the sheet of tin-plate will have punched into it twelve holes designated, 1, as shown in Fig. 4, thus producing twelve disks. It will be observed that the holes made in the sheet by this first cut are not close together, but are spaced apart so

as to leave intervening portions of the sheet uncut, and the holes are disposed so as to cover a large part of the sheet. As shown in Fig. 4 there are four straight vertical lines of holes,—three holes being in each line. Without removing the sheet from the press the operator will now manually shift the sheet, keeping its side-edge, 17, against the back stops, 12, so as to place the opposite end-edge, 16, against the right-hand gage or stop, 14. This shifting movement of the tin-plate is very slight, being only a space equal to the diameter of one die, and is made with speed as compared to the time otherwise consumed in wholly withdrawing the sheet from the press and turning it over and re-presenting it for another stroke. After thus shifting the sheet from one stop or gage to the other, a second stroke of the gang of punches is made which results in punching nine holes into the sheet at the intervening spaces that were left uncut after the first stroke. Thus a number less than all the dies make cuts. The group of dies that are operative in this second cut comprise the three vertical rows nearest the right-hand end, nine in number. The end-edge, 16, of the tin-plate sheet in this second stroke projects toward the right-hand beyond the range of the gang of dies, a space equal to the diameter of one die, consequently in the present instance no cuts are made by this stroke in that projecting end of the sheet. One line of the gang comprising three dies at the left-hand end, are ineffective in this second stroke, because no part of the tin-plate sheet is engaged by these dies.

It will be observed that the holes cut in the sheet by the second stroke are designated, 2, and are also distinguished in the drawing from the holes cut by the first stroke, by cross-hatched lines that extend in a different direction. In like manner the holes cut by the succeeding strokes are similarly distinguished, 3, and, 4.

Without removing the sheet after the second stroke, the operator manually revolves and thus changes the tin-plate sheet end-for-end, but with the same surface uppermost, which brings the side edge, 18, of the sheet against the back gage or stop, 12, and the end-edge, 16, against the left-hand gage or stop, 13. This changed position of the sheet exposes other intervening uncut spaces to the action of the gang of dies. The third stroke of the gang of punches is then made and as all the punches are now effective twelve holes are cut into the sheet, these are designated, 3.

After the third stroke of the die punches the operator manually shifts the sheets for the fourth stroke of the punches. The end-edge, 15, of the sheet is now brought against the right-hand gage or stop, 14, and the

fourth stroke of the punches is made; by this stroke, as in the case of the second stroke, nine holes are cut into the sheet and the total number of possible holes have now been cut, 5 resulting in the production of forty-two disks.

It will be seen from the foregoing description that the two gages, 13, 14, at opposite ends of the gang of dies have been operated 10 or employed alternately—one gage governing the position of the tin-plate sheet at one stroke of the die-punches and the other gage governing its position at the next stroke.

The method described herein, of cutting 15 disks from sheet metal forms the subject matter of my application Serial Number 474,766, filed January 28th, 1909.

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

1. The combination with the bed-plate and the head-plate of a gang of dies, of a plural number of female parts of said dies secured to one of said plates and grouped or 25 disposed on the plate in straight lines in two right-angled directions—and forming open spaces that extend in two sets of corresponding straight lines; the same number of die-punches secured to the other plate and co-acting with said female parts; gages at the 30 rear side of the gang of dies and which maintain the back edge of the sheet of metal in the same position at every stroke of the die-punches; and two gages each in position adjacent an opposite end of said gang of dies 35 and adapted for each gage to govern the position of the end edges of the sheet of metal at alternate strokes of the die-punches.

2. In a gang of dies for cutting disks from 40 sheets the combination with a plurality of female die members, of a plurality of co-acting male die members; a gage at the rear side

of the gang of dies to maintain the back edge of the sheets in the same position at every stroke of the die-members; a gage at one end 45 of the gang dies for positioning the sheet to be cut by all the die members, and another gage at the opposite end of the gang dies for positioning the same sheet to be cut by a portion only of said die members. 50

3. In gang dies for cutting disks from sheets the combination with a plurality of female die-members, of a plurality of co-acting male die-members; gages at opposite 55 ends of the gang of dies,—the gage at one end being close to the gang of dies at said end,—and the gage at the other end being removed from the gang of dies at said latter end a space at least equal to the diameter of one die. 60

4. In gang dies for cutting tops and bottoms of tin-cans the combination with a bed plate and a head plate of a plural number of dies; a gage or stop at the rear side of those die-members which are secured to the bed- 65 plate to maintain the back edge of the sheets to be cut in the same position at every stroke of the die-punches; a second gage or stop adjacent one end of said bed-plate die-members and against which one end-edge of the 70 sheet will be placed when the die-punches make a stroke, and a third gage or stop adjacent the opposite end of said bed-plate die-members and positioned so as to permit the sheet to slide away from the second gage or 75 stop and bring the opposite end-edge of said sheet against the said third gage or stop when the die-punches make another stroke.

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

DANIEL P. ROBINSON.

Witnesses:

CHAS. B. MANN,
G. FERDINAND VOGT.