

No. 777,744.

PATENTED DEC. 20, 1904.

R. PAUL.

APPARATUS FOR THE MANUFACTURE OF MEDICAL OR LIKE CAPSULES.

APPLICATION FILED MAY 10, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig.1.

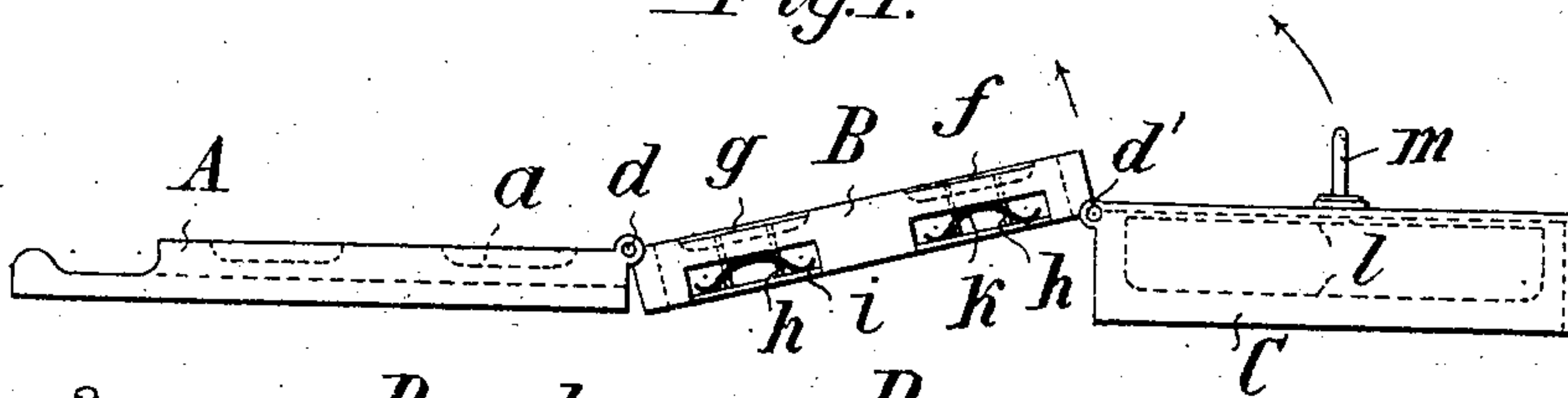


Fig.2.

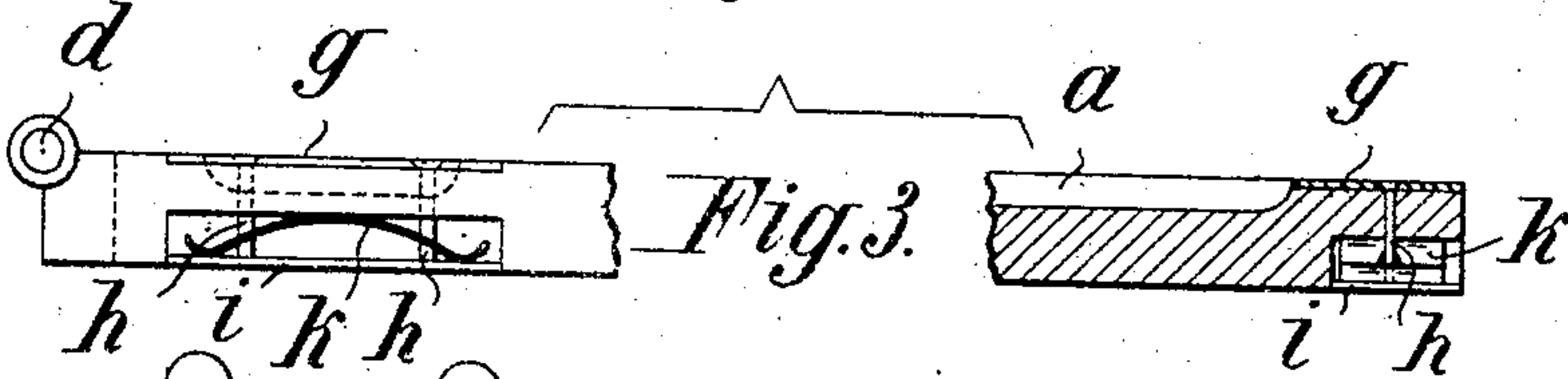
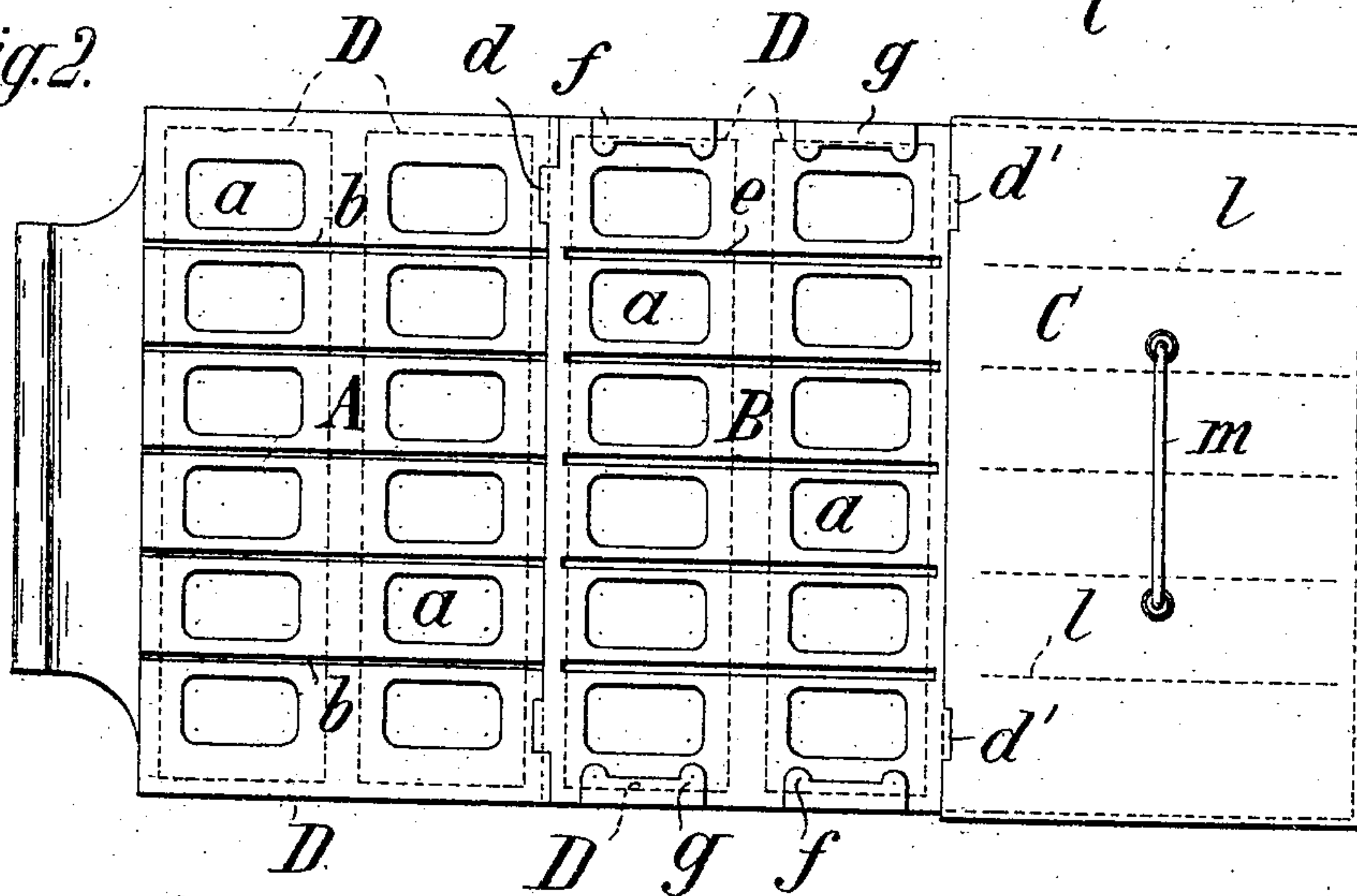


Fig.4.

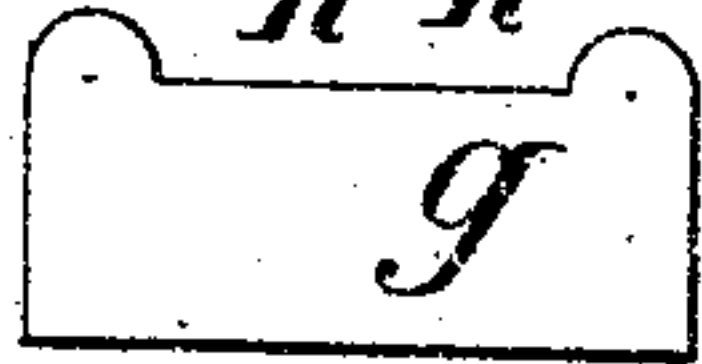
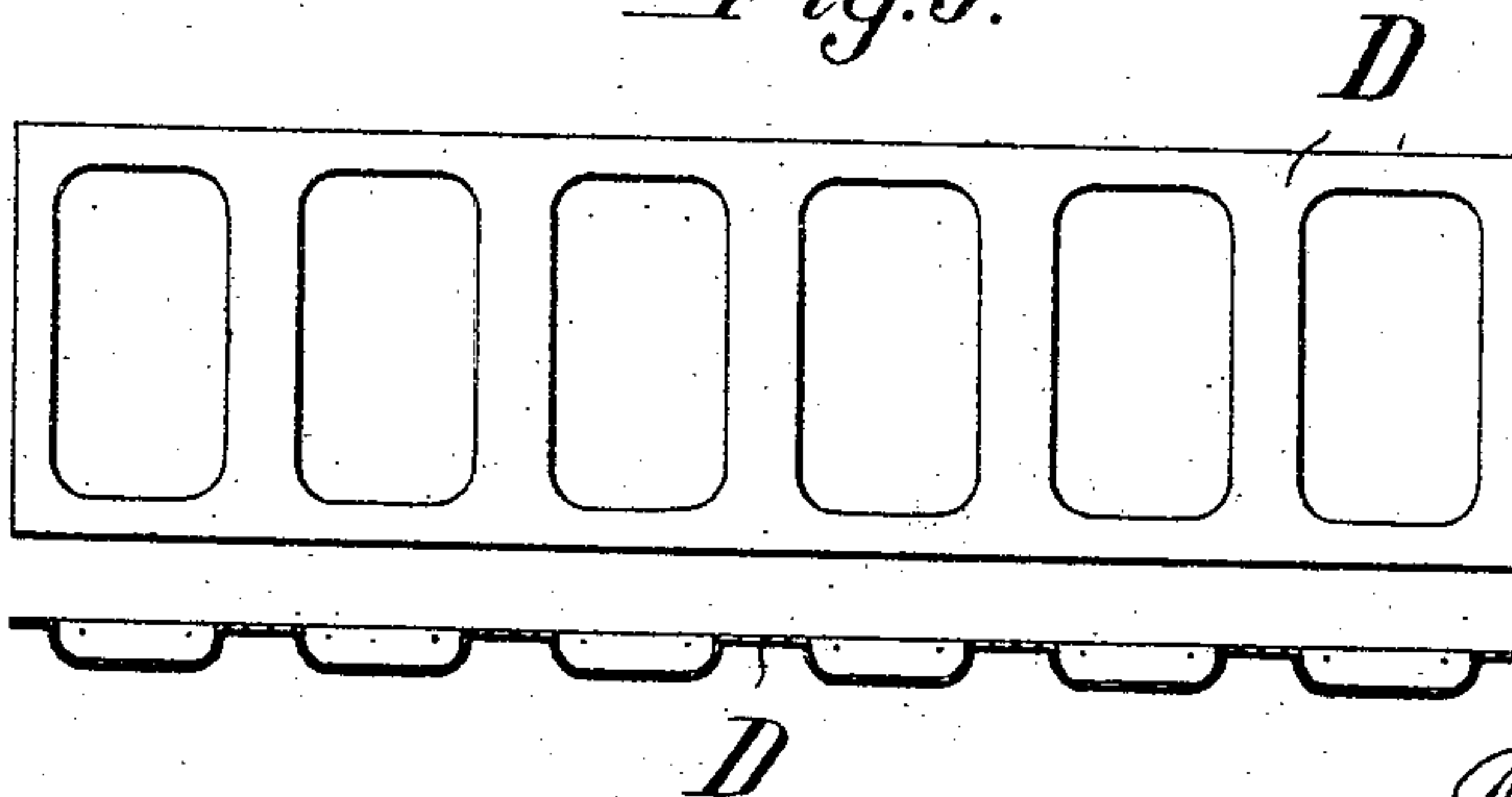


Fig.5.



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2 SHEETS—SHEET 2.

Fig. 6.

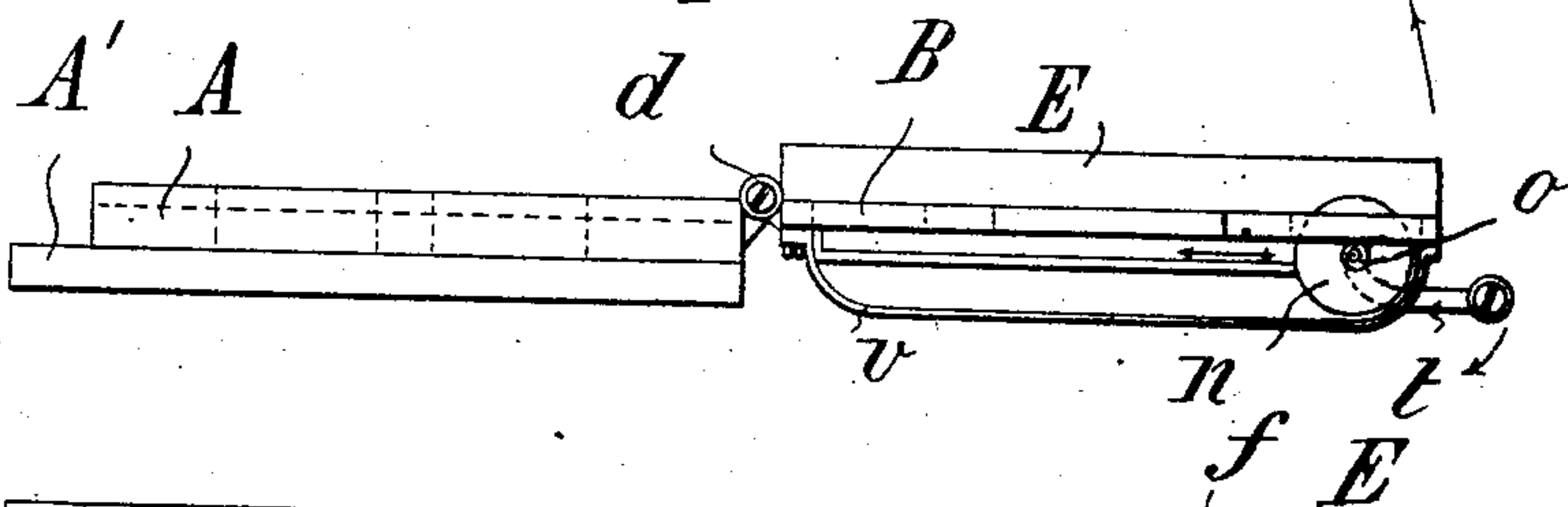


Fig. 7.

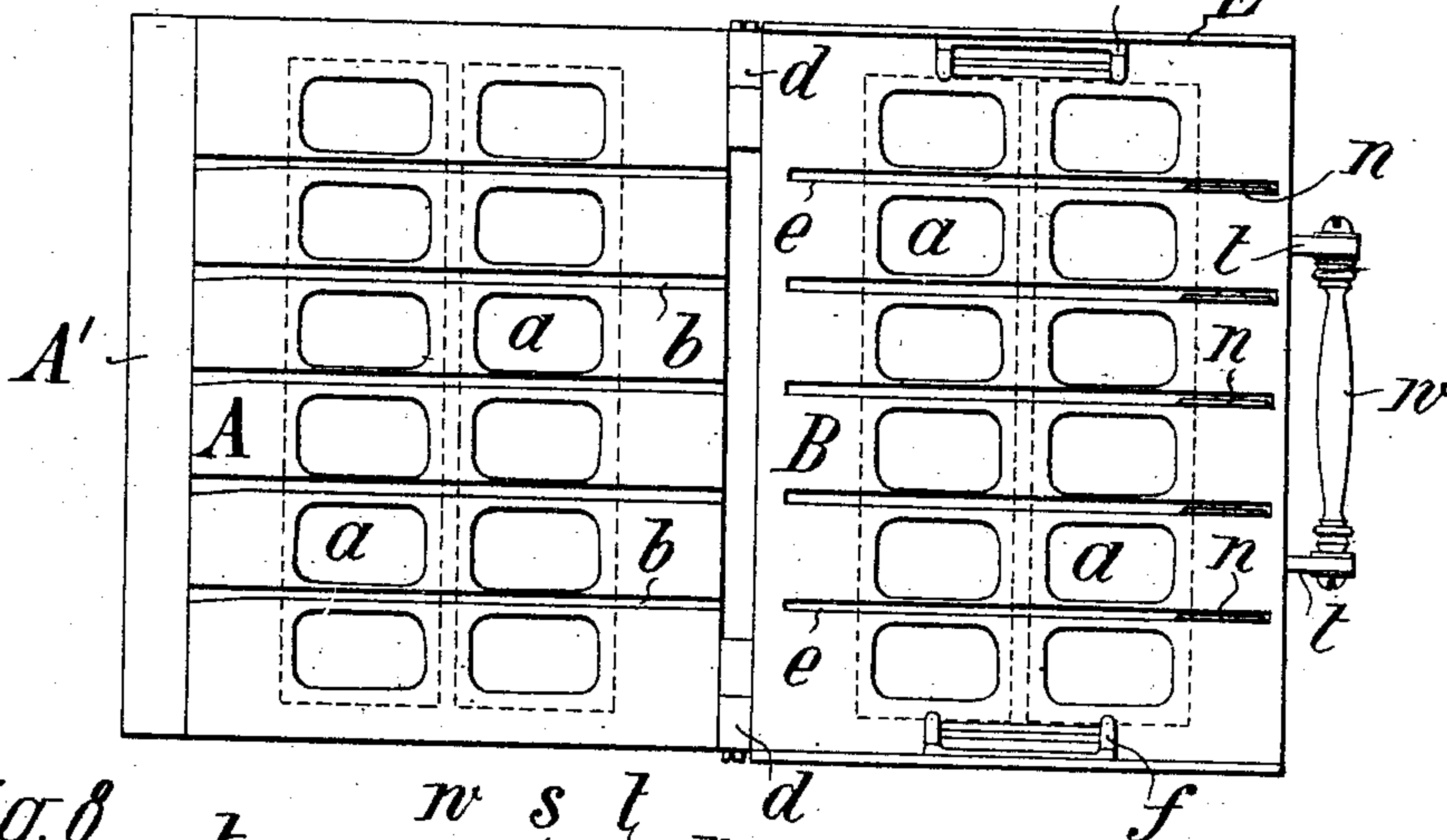


Fig. 8.

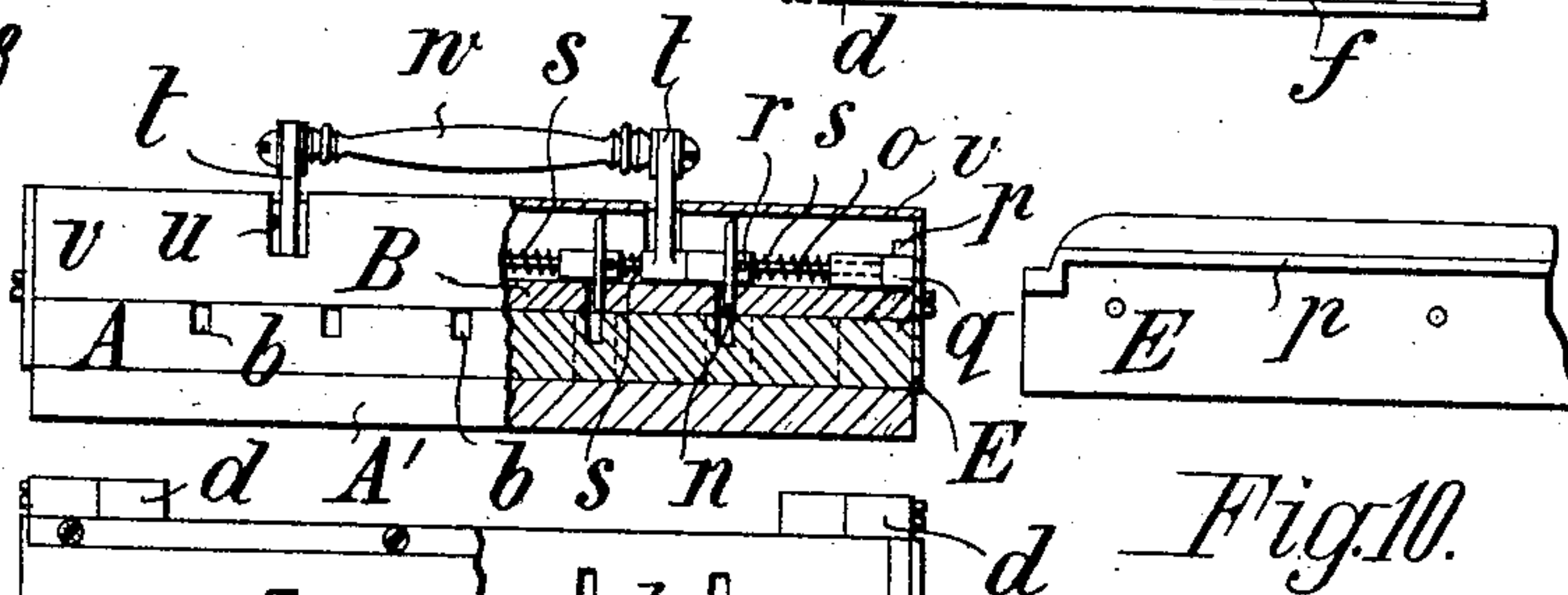


Fig. 9.

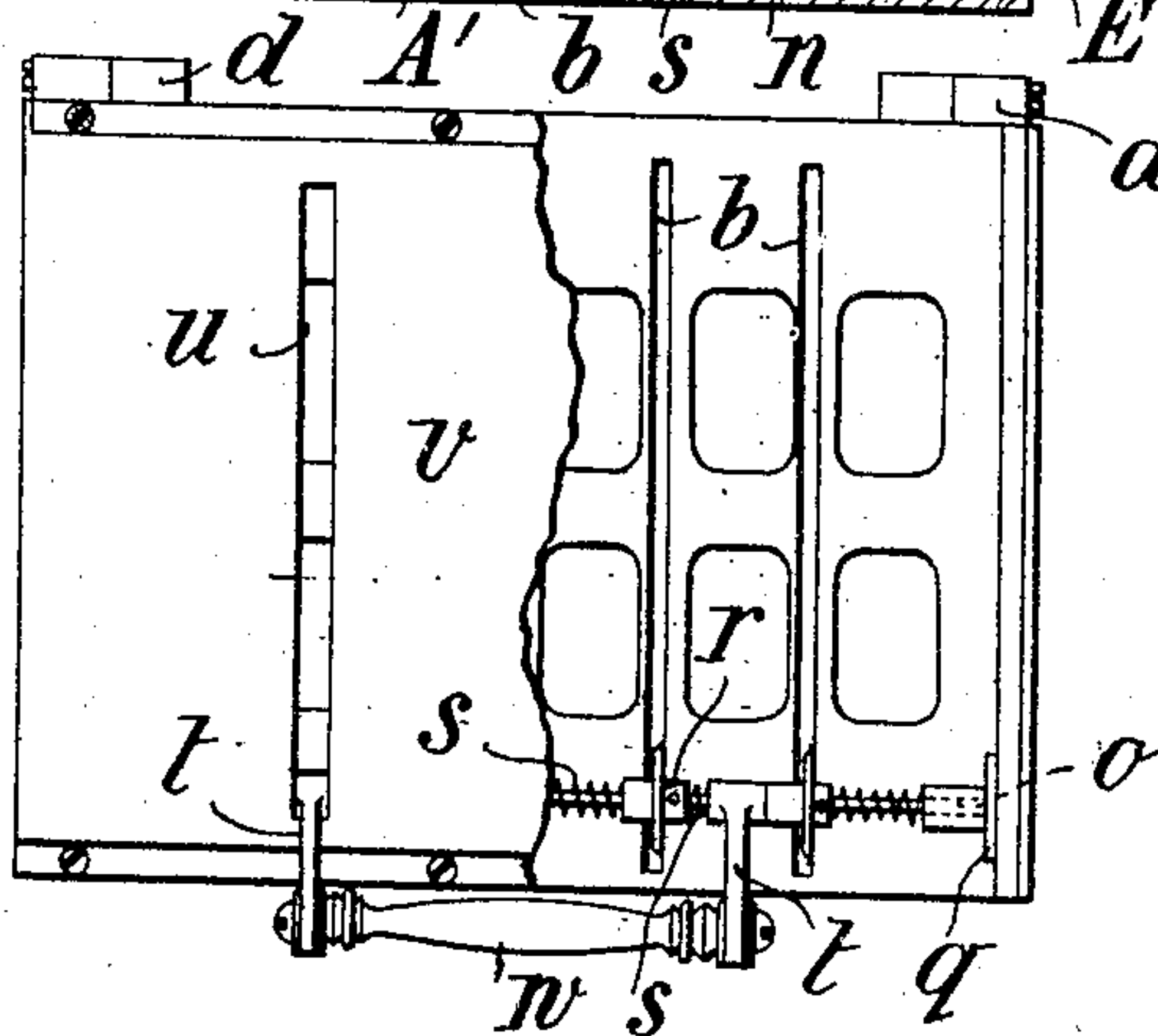


Fig. 10.



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# UNITED STATES PATENT OFFICE.

ROBERT PAUL, OF VIENNA, AUSTRIA-HUNGARY.

APPARATUS FOR THE MANUFACTURE OF MEDICAL OR LIKE CAPSULES.

SPECIFICATION forming part of Letters Patent No. 777,744, dated December 20, 1904.

Application filed May 10, 1904. Serial No. 207,289.

*To all whom it may concern:*

Be it known that I, ROBERT PAUL, a subject of the Emperor of Austria-Hungary, residing at Vienna, Austria-Hungary, have invented certain new and useful Improvements in Apparatus for the Manufacture of Medical or Like Capsules, of which the following is a specification.

Hitherto in the manufacture of concealers or capsules for powders, drugs, and the like perforations have been provided either between the recesses or pockets which are intended to receive the separate doses and which are previously formed in a sheet of paper or the like and also at the corresponding places in a sheet of paper or the like, which is stuck on and is intended to serve as the means of closing said recesses, or a large number of connected capsules are formed by suitably compressing two sheets of dough or other plastic material. The first method has the disadvantage that the closing of the paper pockets by a firm and uniform pressing of the covering-sheet thereon must be effected by hand with great care and consequent loss of time and also that the subsequent separating of the capsules one from the other is effected by hand by tearing the material along the lines of the perforations, whereby the consequent and unavoidable shaking of the capsule-cases is very liable to cause some of the covering-sheets to come open unintentionally, and thus cause the contents of the capsule to be spilled. The second method has the disadvantage that the several capsules must first be separated slowly and carefully by means of scissors or the like at the places where the two sheets of dough are adhering to each other. Now these disadvantages are avoided according to this invention by the fact that neither the joining together of the two parts of the capsule nor the separating of the finished capsules one from the other is effected by hand, but is effected quickly and surely by means of a mechanical apparatus. With the aid of this apparatus strips of suitable material, provided with previously-formed recesses for the reception of powders, drugs, medicines, or other substances in measured quantities, are stuck over and closed by means of a second similar strip and are simultaneously

cut up into a number of closed capsules. With the aid of this apparatus it is possible to manufacture rapidly at one time a large number of such capsules without the otherwise necessary manipulations, which are either tedious or unsuitable from a hygienic point of view, such as more particularly the blowing or inflating of the capsules.

In the accompanying drawings, Figures 1 to 5 represent one form of execution of the invention, and, viz., Fig. 1 is a side elevation, and Fig. 2 is a plan, of an apparatus for filling, closing, and separating capsules in position ready for filling. Figs. 3 and 4 illustrate one of the clamping devices employed in this connection for a strip shown in Fig. 5, intended for the formation of the capsules. Figs. 6 to 10 represent a modified form of the apparatus forming subject-matter of the invention. Fig. 6 shows a side elevation, and Fig. 7 a plan of the apparatus in its opened position, while Figs. 8 and 9 represent, respectively, a front elevation, partly in section, and a plan of the modified apparatus in its closed position. Fig. 10 shows a detail view of the lateral wall of the apparatus.

The improved apparatus shown in Figs. 1 to 5 comprises a bed-plate A, provided with pockets *a*, arranged in rows, and with slots or grooves *b*, also arranged in rows between these rows of pockets. The plate A is connected, by means of hinges *c*, to a cover-plate B, which is similarly provided with pockets *a* and slots *e*, corresponding with the slots *b*. This plate B is connected, by means of hinges *c'*, to a plate C, which is provided on its upper side with a handle *m* and on its lower side with knives *l*, arranged to correspond with the slots *e* and slots *b*. The middle plate B is provided at its ends with the clamping devices *f*, which serve to hold fast on the plate B strips D, of paper or other suitable material, formed with pockets. They may consist of clamping-plates *g*, mounted on guide-pins *h*, these plates being adapted to be drawn, by means of springs *k* acting upon press-plates *i*, that are also mounted on the pins *h*, into corresponding recesses in the upper side of the plate B. They are also adapted to be raised by pressing up the press-plates *i* for the purpose of



inserting the strips D. The described clamping device may be replaced by any other clamping device. The strips D are pasted on their borders and between the pockets with  
 5 an adhesive substance.

The modified form of the apparatus shown in the Figs. 6 to 10 differs from the above-described form of the apparatus principally by the arrangement of the cutting device.  
 10 Instead of the knives *l*, affixed to the plate C, the modified apparatus is provided with circular cutters *n*, rotatable round the axis *o*, which can be displaced in longitudinal direction of the slots. Upon a wooden support A'  
 15 is affixed the plate A, which is connected with the plate B also by means of hinges *d*. To the plate B are affixed on both sides lateral walls E, which are provided each with a ledge *p*, projecting to the inward, the said ledges *p*  
 20 and the upper face of plate B forming between them guide-grooves for the sliding blocks *q*, in which the cutter-shaft *o* is journaled. The cutters *n*, which are rotatably arranged on the shaft *o*, are on the one hand  
 25 secured against lateral displacement by the annular stops *r*, while on the other hand they are pressed against these stops *r* by the spiral springs *s*, so that when the apparatus is closed the cutters *n* are constantly pressed against  
 30 the cutting edges of the slots *b* of the plate A. The shaft *o* is carried by two arms *t*, which pass through slots *u* of the plate *v*, provided for the protection against the cutters, said arms *t* being connected together by means  
 35 of the transverse bar *w*. In this manner the two arms *t* and the transverse bar *w* form a handle by means of which the shaft *o*, together with its sliding bearings, can be moved  
 40 along the guide-grooves formed between the ribs or ledges P and the upper face of plate B, above referred to, as is indicated by the horizontal double arrow in Fig. 6.

The operation of these apparatuses is as follows: Strips D are placed upon the plate  
 45 A and upon the plate B, as shown in Figs. 1 and 2 and in Figs. 6 and 7, respectively, and the strips situated on the plate B are held fast thereon by having their ends tucked under the clamping device *f*. Then after having  
 50 introduced the powders, drugs, or the like into the pockets of the strips on the plate A the flat portions of the strips held upon the plate B, which have been provided with an adhesive, are moistened, and the plate C being grasped  
 55 by its handle is raised and moved in the direction of the arrow, Figs. 1 and 6, in such a manner as to turn the plate B down upon the plate A, and thus cause the gummed moistened edges of the strips which are situated on the  
 60 plate B to come onto the border or edges of the strips on plate A, thereby closing the filled pockets *a* of the strips lying upon the plate A. During this operation when working with the first form of execution of the appa-  
 65 ratus shown in Figs. 1 to 5 the plate C comes

over the plate B in such a manner that as it is pressed down upon the latter its knives *l* pass through the slots in the plate B until they enter the grooves in the plate A, and thus sever the adhering strips between every two  
 70 contiguous rows of filled pockets. Then on opening the apparatus the closed capsules lie separated from one another on the plate A. In the modified construction of the apparatus shown in Figs. 6 to 10 the cutting of the  
 75 strips is effected by means of the circular cutters *n*, to which a rolling motion along the slots *b* is imparted by the handle *w*.

I claim—

1. Apparatus such as described, comprising  
 80 a bed-plate provided with one or more rows of suitably-spaced cavities and with grooves intersecting the space between two cavities of a row of such, a cover-plate provided with corresponding cavities and with slots inter-  
 85 secting the space between two cavities of a row of such; in combination with cutters movable in said slots and grooves, for the purpose set forth.

2. Apparatus such as described, comprising  
 90 a bed-plate provided with one or more rows of suitably-spaced cavities and with grooves intersecting the space between two cavities of a row of such, a cover-plate provided with corresponding cavities and with slots inter-  
 95 secting the space between two cavities of a row of such and a clamping device at each end of a row or rows of cavities in said cover-plate; in combination with cutters movable in said slots and grooves, for the purposes set  
 100 forth.

3. Apparatus such as described, comprising a bed-plate provided with one or more rows of suitably-spaced cavities and with grooves intersecting the space between two cavities of  
 105 a row of such, a cover-plate hinged to said bed-plate and provided with corresponding cavities and with slots intersecting the space between two cavities of a row of such; in combination with revoluble cutters projecting  
 110 through the slots in the cover-plate into the grooves of the bed-plate and means to move the cutters to and fro along said slots and grooves, for the purpose set forth.

4. Apparatus such as described, comprising  
 115 a bed-plate provided with one or more rows of suitably-spaced cavities and with grooves intersecting the space between two cavities of a row of such, a cover-plate hinged to said bed-plate, provided with corresponding cavi-  
 120 ties and with slots intersecting the space between two cavities of a row of such and a clamping device at the ends of the row or rows of cavities consisting of a clamping-plate, a stud or studs secured thereto and ex-  
 125 tending into recesses in the upper face of the cover-plate, a plate *i* secured to the free end of said stud or studs and a spring interposed between the plate *i* and the bottom of the re-  
 130 cess; in combination with cutters movable in



the slots of the cover-plate and grooves in the bed-plate, for the purpose set forth.

5. Apparatus such as described, comprising a bed-plate provided with one or more rows of suitably-spaced cavities and with grooves intersecting the space between two cavities of a row of such, and a cover-plate having corresponding cavities and slots intersecting the space between two cavities of a row of such; in combination with a cutter-shaft slidable along the cover-plate, discoidal cutters revolubly mounted on said shaft and projecting through

the slots in said plate into the grooves of the bed-plate and means to move the cutter-shaft to and fro along the cover-plate, for the purpose set forth. 15

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT PAUL.

Witnesses:

JOSEF RÜBRESCH,  
ALVESTO S. HOGUE.