

G. A. GOODSON.
PUZZLE.

No. 472,292.

Patented Apr. 5, 1892.

Fig 1

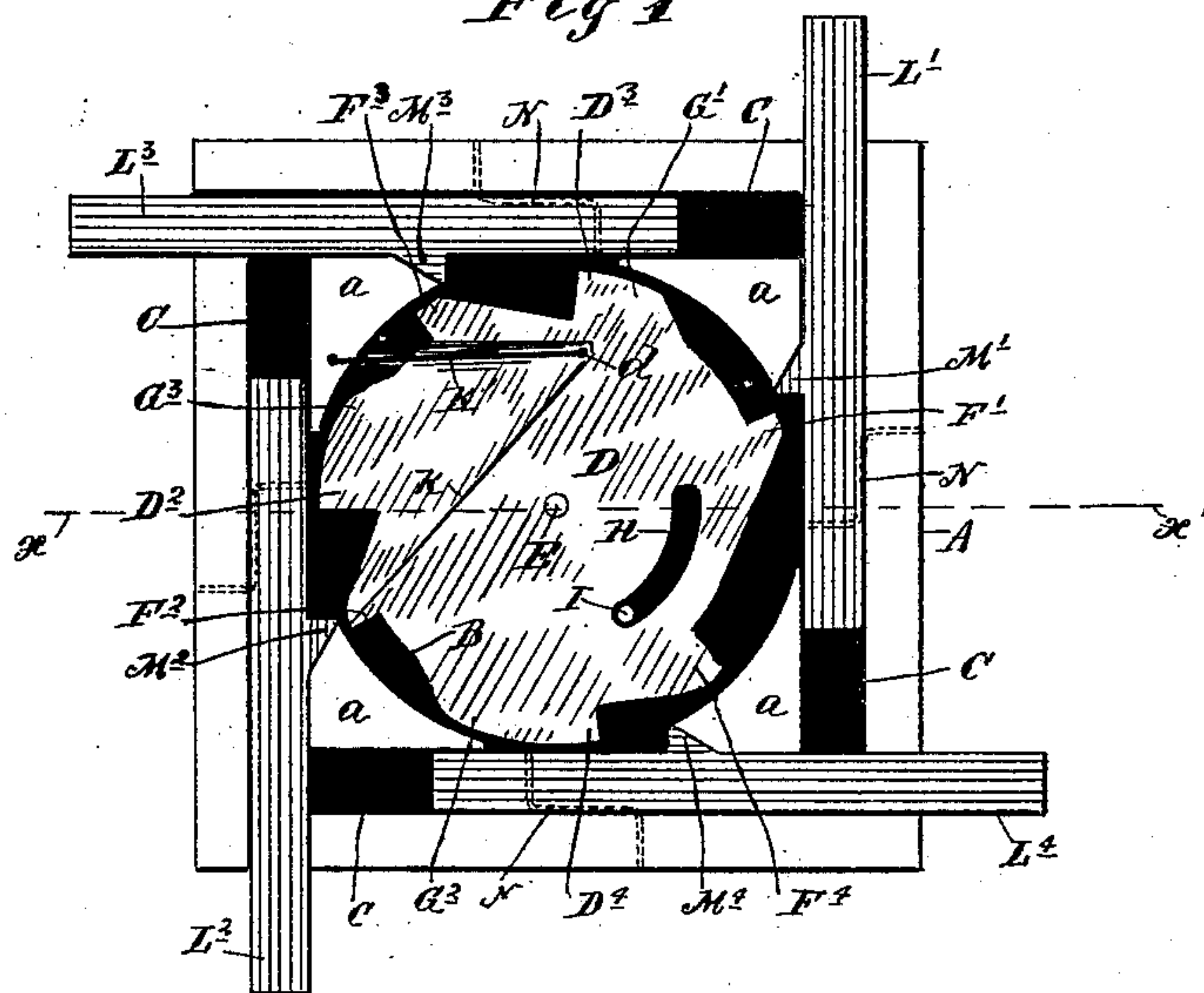


Fig. 5.

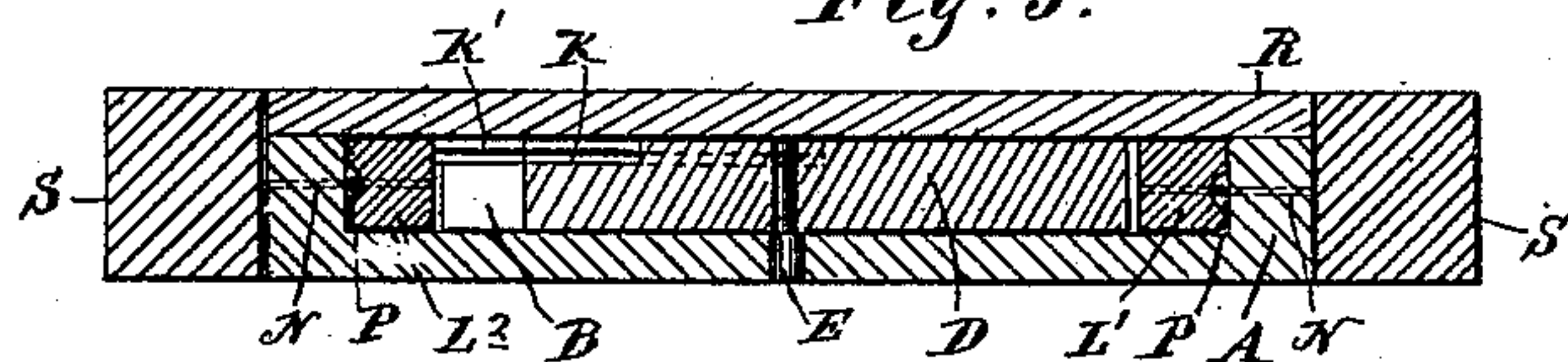
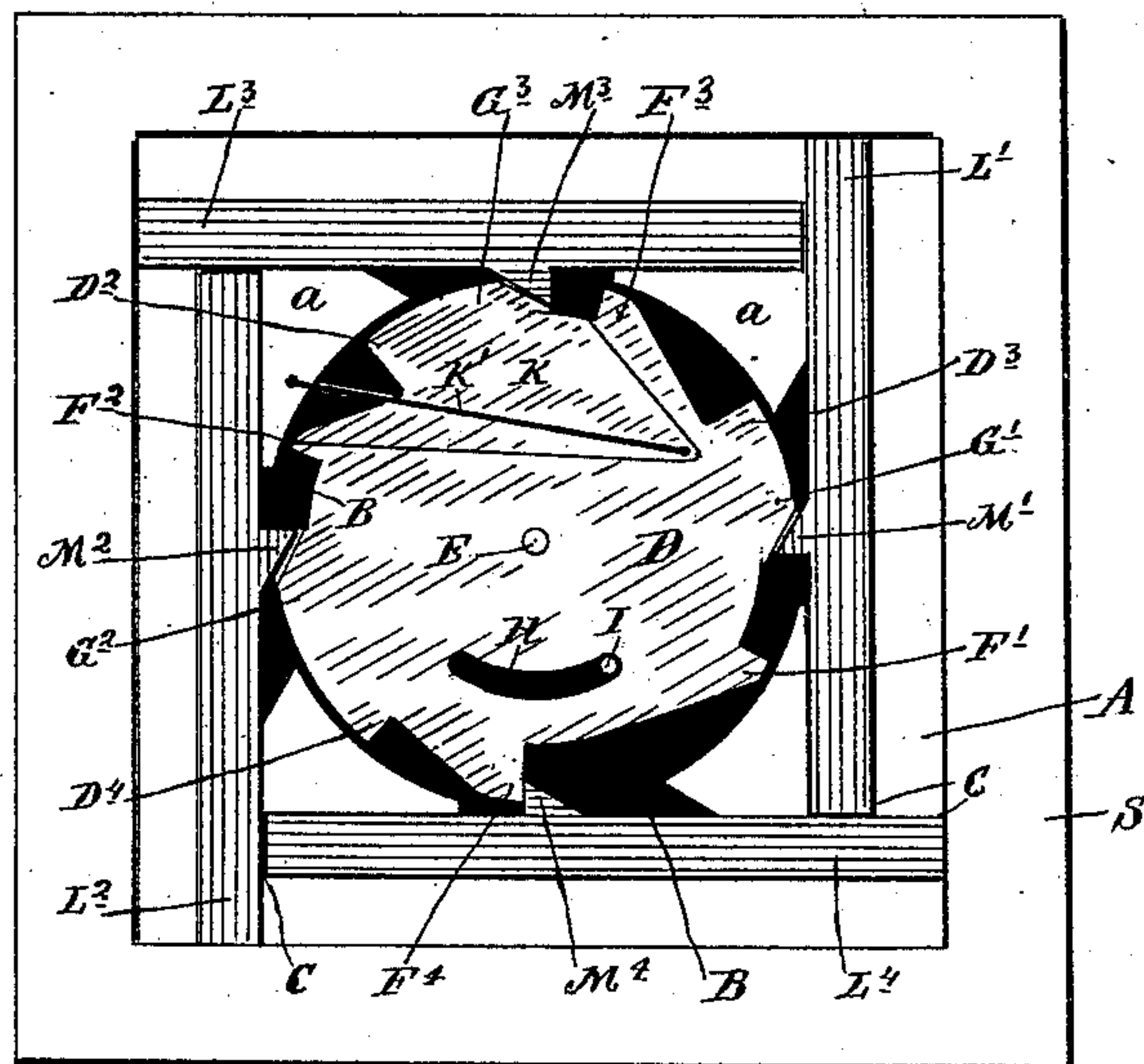


Fig. 4.



Witnesses

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(No Model.)

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Fig. 2.

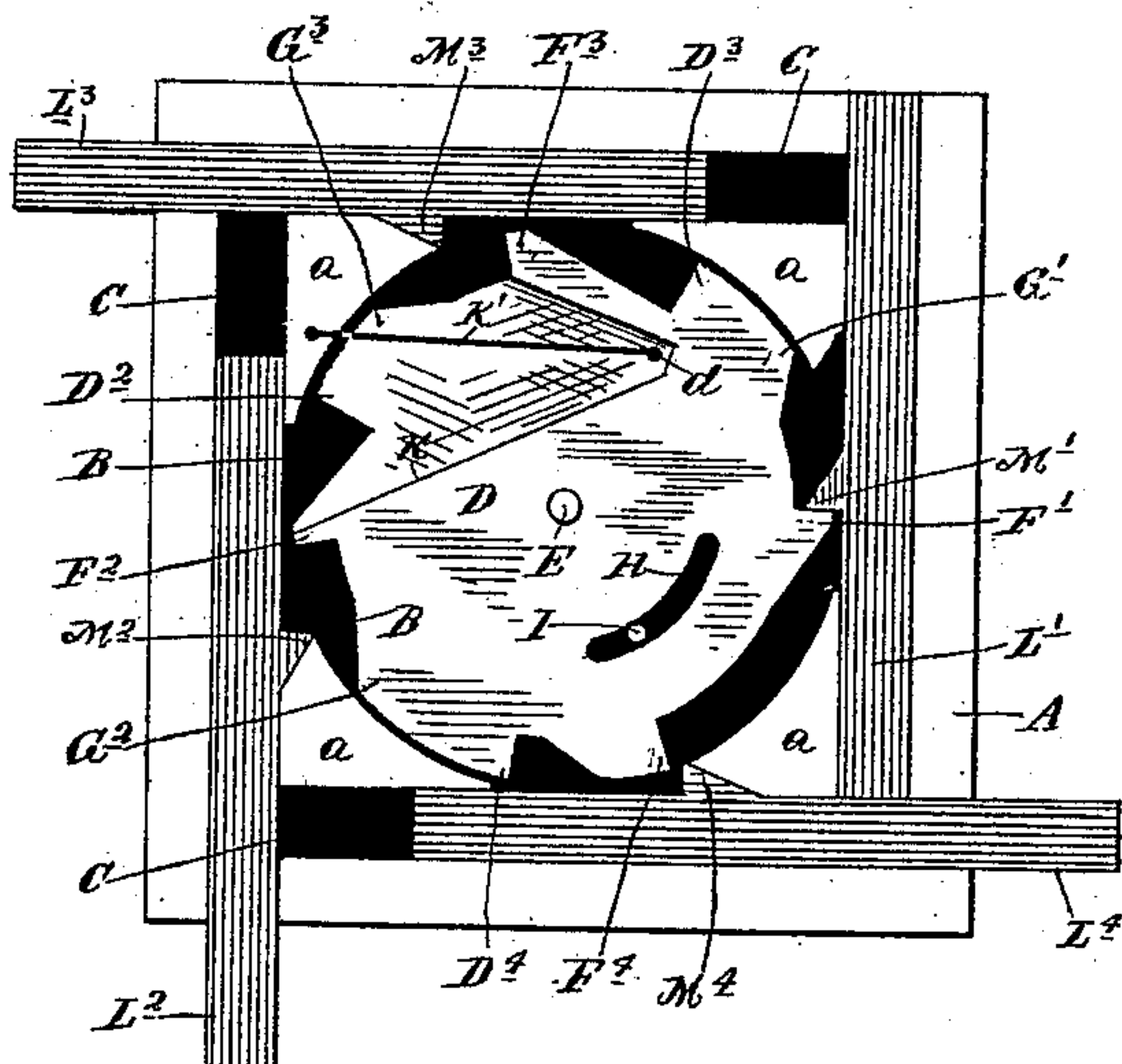
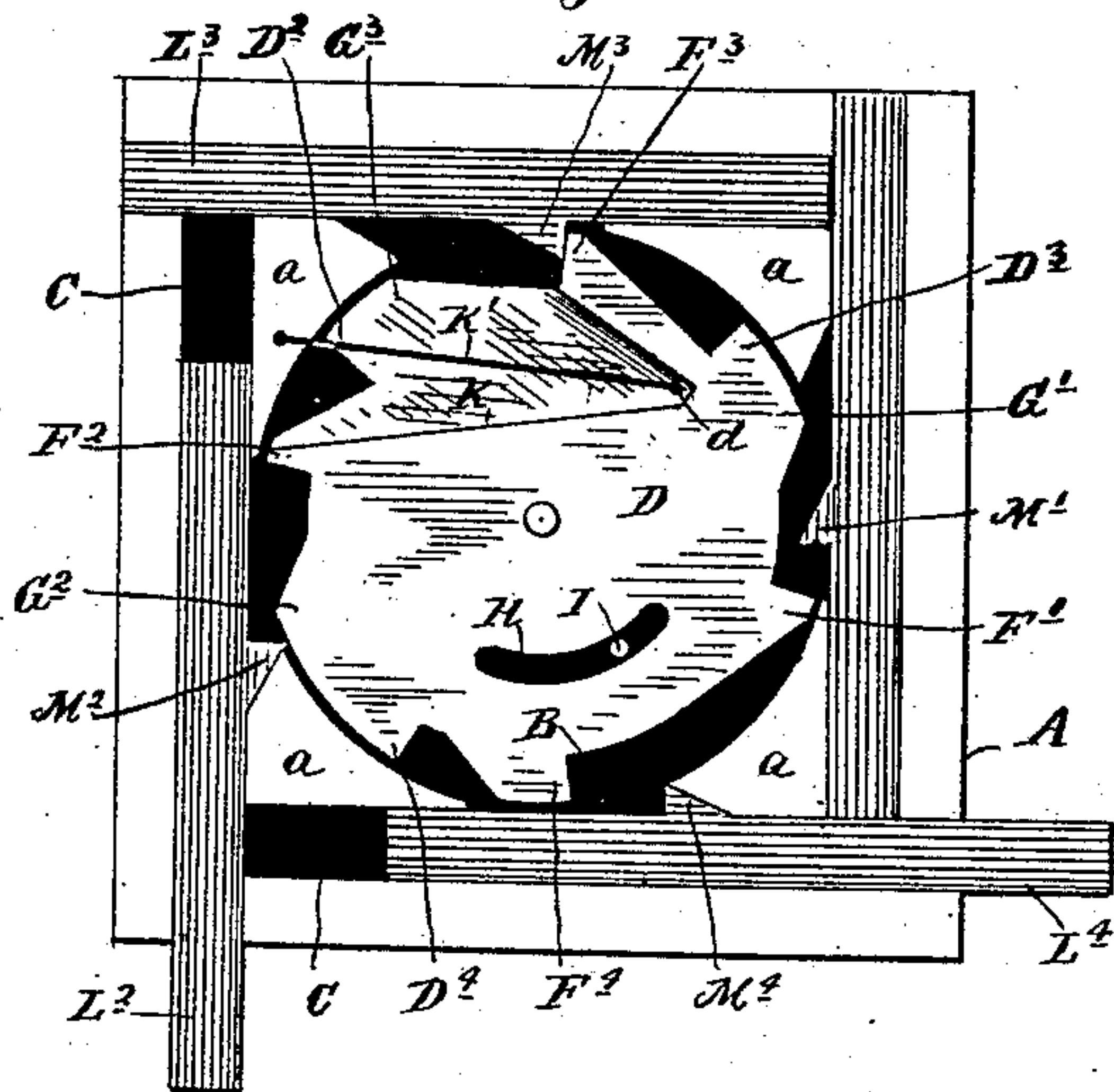


Fig. 3.



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Fig. 6. Patented Apr. 5, 1892.

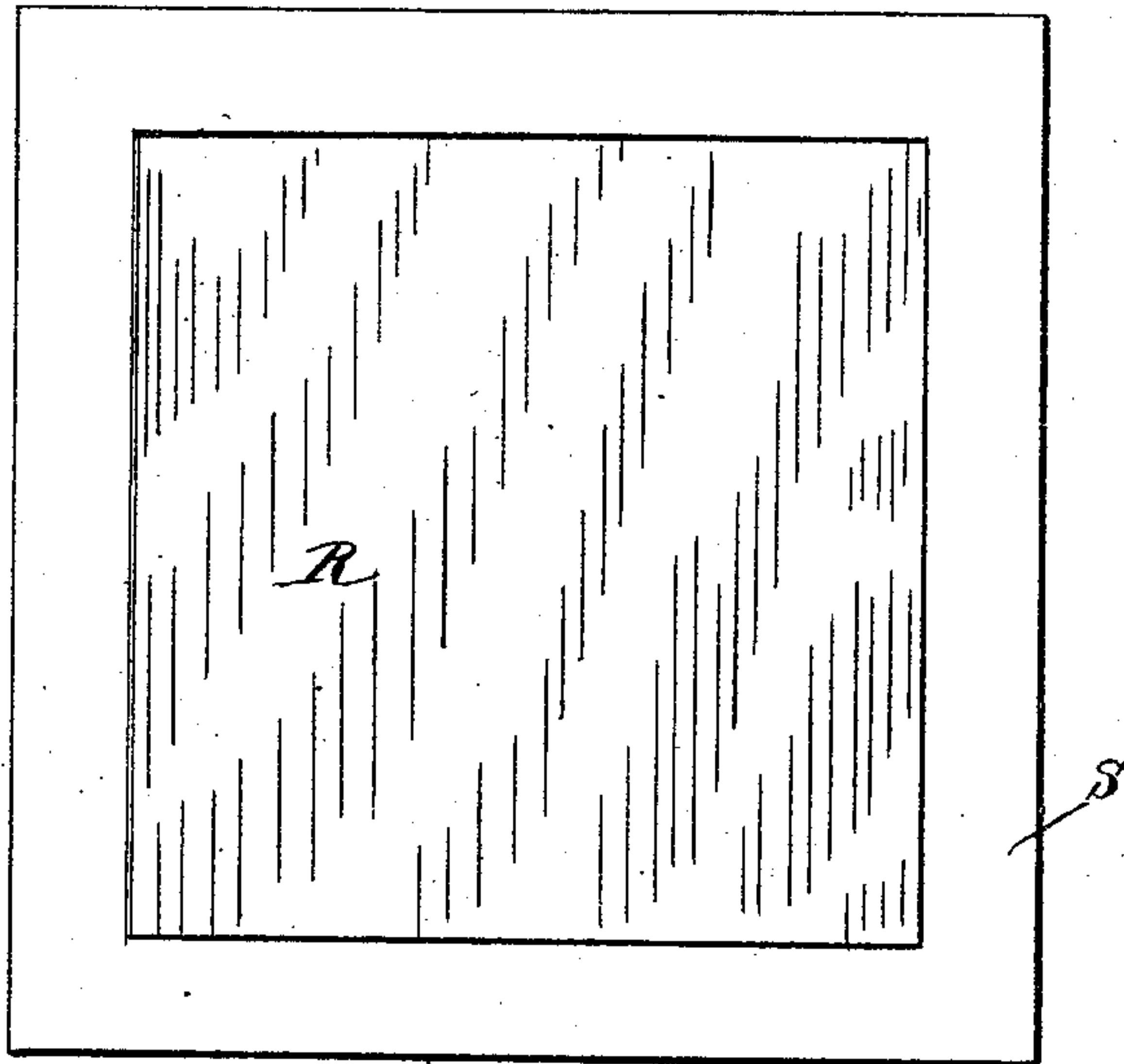


Fig. 8.

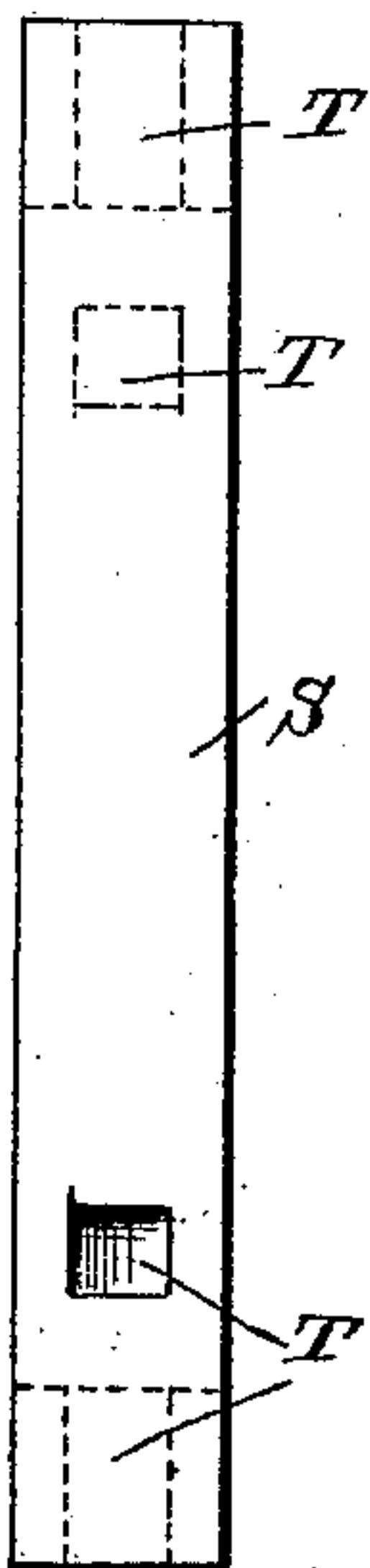
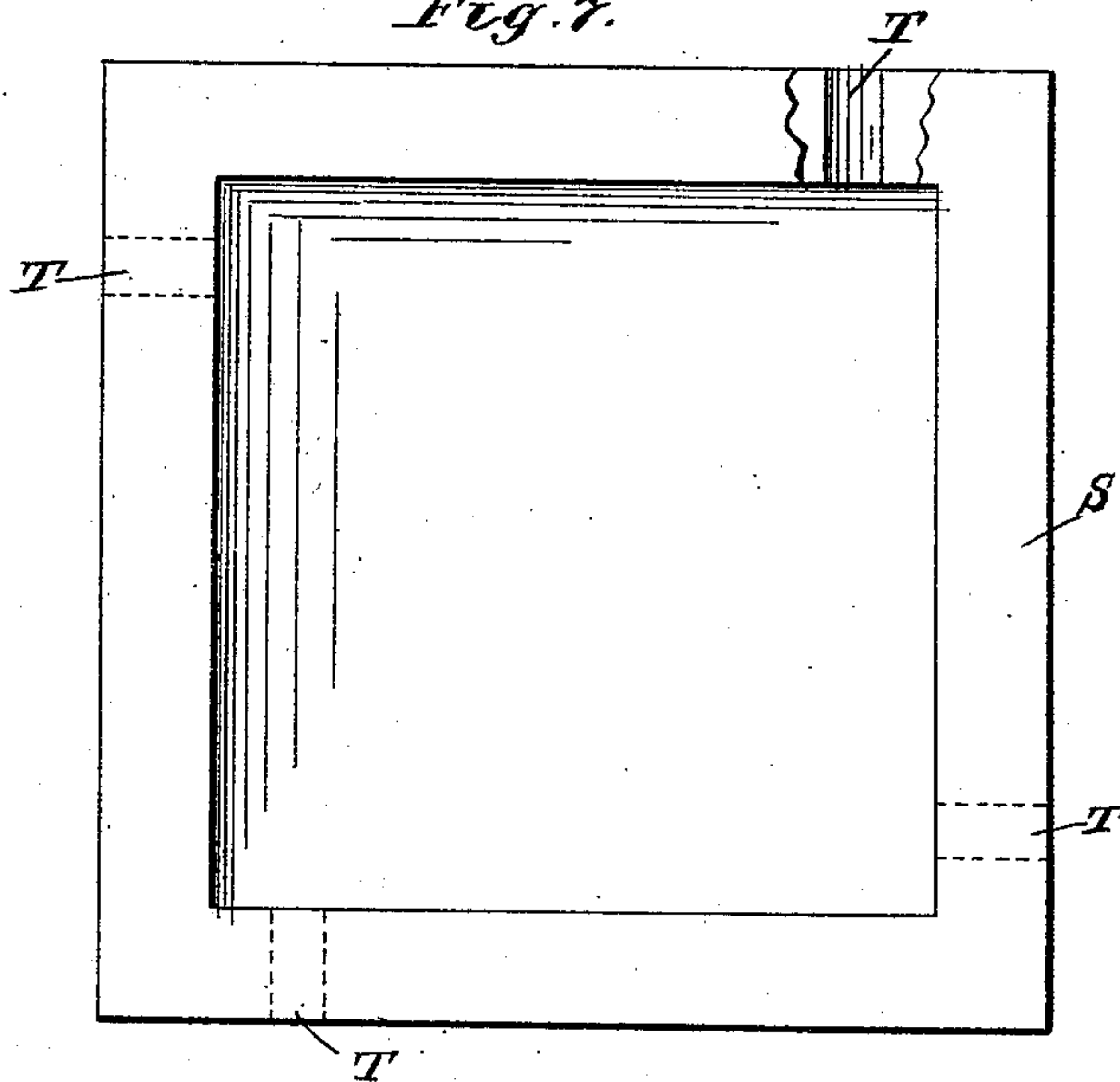


Fig. 7.



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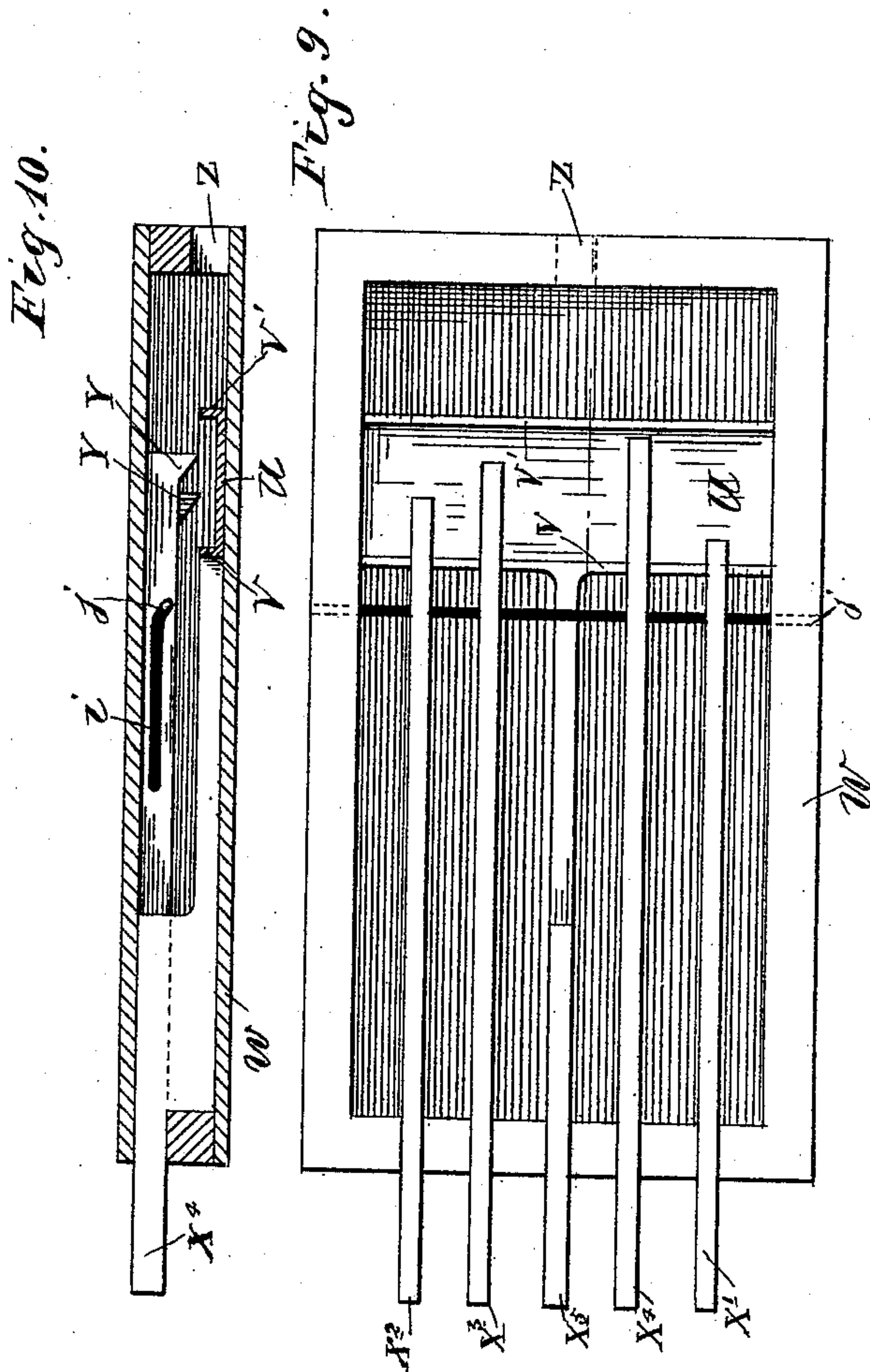
(No Model.)

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UNITED STATES PATENT OFFICE.

GEORGE A. GOODSON, OF MINNEAPOLIS, MINNESOTA.

PUZZLE.

SPECIFICATION forming part of Letters Patent No. 472,292, dated April 5, 1892.

Application filed May 12, 1891. Serial No. 392,480. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. GOODSON, a citizen of the Dominion of Canada, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Puzzles; 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.

My invention has for its object to provide an interesting and amusing puzzle. To this end I employ a series of independently-movable pieces and one or more movable blocking-surfaces engageable therewith. The relative arrangement of the independently-movable pieces and the movable blocking-surfaces are such that the said pieces can only be all brought to a final position by moving the same in a definite predetermined order. In other words, if the movable pieces be manipulated in the proper order the body carrying the blocking-surfaces will be moved forward step by step by each successive piece and permit all the pieces to be brought to the final position. If, however, the movable pieces be manipulated in any other than the proper order, the body carrying the blocking-surfaces will be moved to bring one or more of the blocking-surfaces into the path of one or more of the pieces, so that the said pieces will be blocked in their movement and cannot be brought into the final position. In my preferred construction the independently-movable pieces are in the form of plungers and the body carrying the blocking-surfaces is in the form of a disk having, in addition to the blocking surfaces or teeth, a set of working surfaces or teeth, and also an intermediate set of what may be called "deceiving surfaces" or "teeth." The disk and the plungers are mounted in suitable seats or guides within a box or block. The relations of the engageable surfaces of the disk to the plungers are such that by successively moving the plungers into engagement therewith, according to the designed order of manipulation, the disk will be moved by each a step in advance, and all of the plungers may thus be brought to the designed final positions; but if the plungers be moved in any other order the engageable surfaces of the disk and the engaging

portions of the plungers will be moved so as to intercept and block the movements of some one or more of the other plungers and prevent them from being brought to their final positions. The plungers which are to be moved successively are placed in an irregular order. The working of the puzzle consists in discovering this order and moving the plungers in accordance therewith from their normal to their final positions.

The device is preferably so constructed that the plungers in their normal positions protrude from the box and in their final positions, after the puzzle has been worked, lie wholly within the box. To add another element to the puzzle, a frame may be provided into which the box may be inserted or from which it may be removed only when the plungers are all in their final or innermost positions.

The invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout the several views—

Figures 1, 2, 3, and 4 are plan views of the device, the cover or top of the box being removed, of which views Fig. 1 shows the parts in their normal positions. Fig. 2 shows the positions of the parts after the first plunger has been moved in its correct order. Fig. 3 shows the positions of the parts after the first plunger has been moved in the correct order and succeeded by the plunger which should have been moved third in order; and Fig. 4 shows all of the parts in the designed final position, the puzzle having been worked and inserted into the frame. Figs. 5 and 6 are respectively a central sectional elevation and a plan view of the entire device. Figs. 7 and 8 are respectively a plan view and side elevation of the entire device with a modified construction of the frame, and Figs. 9 and 10 are views in plan and sectional elevation of modified construction of the entire device.

A is a block-like box cut below its surface to form a central disk-seat B, and a series of open-ended plunger-seats C in communication therewith, leaving the corner-pieces *a* in the angles between the plunger-seats and the disk-seat.

D is the disk pivotally secured in the disk-seat B on a pivot-pin E, projecting from the

bottom of the box A. The periphery of this disk is cut to form working teeth $F' F^2 F^3 F^4$, blocking-surfaces $G' G^2 G^3$, and intermediate or deceiving teeth $D^2 D^3 D^4$.

5 H is a slot cut through the disk, engaging a stop-pin I, projecting from the bottom of the box A for limiting the movement of said disk. This disk is also cut down below its face at K to give clearance for an elastic cord
10 K' , which is secured at one end to the disk at d and at the other to one of the corner-pieces a . This cord tends to keep the disk drawn into its normal position, stopped by the stop-pin I, engaging one of the extremities of the
15 slot H, as shown in Fig. 1.

$L' L^2 L^3 L^4$ are plungers movably seated in the plunger-seats C, provided, respectively, with engaging projections $M' M^2 M^3 M^4$.

20 N are elastic cords located in grooves P cut in the backs of the plungers, each of which is secured at one end to one of the plungers and at the other to the box A. The elastic cords tend to keep the plungers in their normal or outermost positions, stopped by the
25 corner-pieces a , as shown in Fig. 1.

R is the cover or top of the box.

S is the open frame fitting the outside of the box A, into which the latter is insertible when the plungers are in their innermost po-
30 sitions.

In the modification shown in Figs. 7 and 8 the frame is provided with perforations T, which will register with the ends of the plungers when the box is inserted into the frame and permit the said plungers to be thrown out-
35 ward into engagement therewith by the elastic cords N, thus securing the box and frame together. The designed order of manipulation of the plungers in this construction is
40 successively $L' L^2 L^3 L^4$, which will bring the engaging projections $M' M^2 M^3 M^4$ of said plungers successively and respectively into engagement with the working teeth $F' F^2 F^3 F^4$ of the disk D. When thus worked, each
45 engaging projection forces its engaged working tooth ahead and moves the disk a step in advance, thus permitting all of the plungers to be brought in succession to their final positions wholly within the box. It will be no-
50 ticed that in the normal position of the parts shown in Fig. 1 the working tooth F' alone stands in advance of the engaging projection M' of the plunger L' . Hence it should be moved first, as shown in Fig. 3. If this be
55 done all of the working teeth will stand in advance of the projections from the plungers, with which they must engage to effect the sought result; but suppose that instead of succeeding plunger L' by plunger L^2 , as would
60 be proper, plunger L^3 is next moved, as shown in Fig. 3, then the blocking-surface G^2 will be turned into the forward path of the projection M^2 of the plunger L^2 and block its inward movement. By succeeding plunger L'
65 with plunger L^4 the blocking-surfaces G^2 and G^3 , respectively, will be thrown into the forward paths of the projections M^2 and M^3 and

block the plungers L' and L^2 . As will be observed, the portions of the disks which are cut away to form the deceiving-teeth $D^2 D^3 D^4$ 70 might have been left solid therewith and the working of the puzzle could still be effected only in the given order of manipulation; but in that case in the normal positions of the parts plunger L' would be the only one that 75 could be moved inward. Hence the order of manipulation would be more easily detected, as no other than the right start could be made. The deceiving-teeth are provided to remove this means of readily detecting the proper 80 start, and are so located that any one of the plungers $L^2 L^3 L^4$ if moved first in order will bring its engaging projection, respectively, into engagement with one of the deceiving-teeth D^2, D^3 , or D^4 , moving the disk and per- 85 mitting the said plunger to be moved to its innermost position. When so moved, however, the projection from the plunger moved will be stopped in the path of the working tooth of the disk with which to effect the final 90 position (shown in Fig. 4) it should have engaged. Thereby the further movement of the disk and of one or more of the other plungers will be blocked, so that the entire set cannot be brought to their final posi- 95 tions. It is also obvious that by moving all of the plungers simultaneously one or more of the engaging projections of the plungers would be thrown ahead of and into the forward path of its engageable working tooth on 100 the disk and cause a blocking of the parts, as just pointed out in the preceding case. The work of the puzzle consists, as stated, in bringing all the plungers to their final positions wholly within the box and inserting it into 105 the frame T.

In the modification shown in Figs. 7 and 8 a double operation is required—one to get the box within the frame and the other to get it out, or vice versa. 110

In the modification shown in Figs. 9 and 10 the body U, carrying the blocking-surface V and the working surface V' , is movable in a straight line within the box W, and the plungers X', X^2, X^3 , and X^4 will engage the work- 115 ing surface in succession when worked in the proper order and move the same one step in succession until all the plungers are brought to their final position wholly within the box; but if any break be made in the proper order 120 by a wrong start or improper sequence in manipulating the plungers the projection Y of some one or more of the plungers will face in front of the blocking-surface V, and be thereby prevented from movement to their 125 final position. The body U is also provided with a plunger X^5 , formed integral therewith, which must be worked last. If otherwise worked it will throw the body from some one or more of the plungers and block their move- 130 ment. This particular plunger X^5 , together with a punch-hole Z in the rear end of the box, serves as the means for retracting the plungers. The loose plungers X', X^2, X^3 , and

X⁴ are guided and lifted clear of the body U at the proper points in their outward movement by cam-shaped slots *i*, properly located therein, engaging a transverse rod *j*. A frame (not shown) might be added, as in the other construction. This modified form of the puzzle has been shown and described simply to give some idea of the range and diversity of which the principle is capable without departing from the spirit of my invention.

It will be understood, of course, that a greater or less number of plungers might be employed to increase or diminish the number of permutations offered and the difficulty of working the puzzle.

It will be also understood that the plungers or movable pieces and the blocking-surfaces might be so arranged that the puzzle might be worked in more than one way. In other words, there may be more than one predetermined order of manipulation.

This puzzle has the distinctive merit of presenting something to do which is apparently extremely simple and easy, but which when attempted is found to require many experiments to successfully work. The problem is an inviting and fascinating one to many classes of minds, and the repeated futile efforts of the operator attempting to solve the same is a source of much amusement to the onlookers.

The word "plunger" or "plungers" as used in this specification and claims was intended to cover and include any form of movable piece, whether it be of straight or curved form, and the word "box" as herein used is intended to cover any form of support for the movable parts. The plungers are designed to be manipulated by hand. The blocking and working surfaces may be on the plungers themselves. In other words, the plungers may be so constructed and arranged that some one or more of the same will permit or block the movement of some one or more of the others, according to whether or not the plungers are moved in the proper order.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A puzzle comprising a series of movable plungers and a movable body having working and blocking surfaces engageable with said plungers, the relative arrangement of the parts being such that when the plungers are moved in the proper order the movable body will be moved one step at a time to per-

mit all the plungers to come to a final desired position, but if in any other order the body will be moved more than one step and cause the blocking-surfaces to intercept one or more of the plungers, substantially as described.

2. A puzzle comprising a supporting-box, a series of movable plungers normally projecting from the box and of a length to lie wholly within the box when in their innermost positions, and a blocking device within the box adapted to intercept one or more of the plungers when manipulated in any other than a predetermined order to prevent the same from being pushed to their innermost position.

3. The combination, with the supporting-box, of plungers normally projecting from the box and movable wholly within the same only when manipulated in a predetermined order, and an open frame for receiving the box only when the plungers are wholly within the same.

4. The combination, with a supporting-box, of plungers under spring-tension and normally projecting therefrom and movable to lie wholly within the same only when manipulated in a definite order, and an open frame having holes registrable with said plungers, whereby the box can neither be inserted in nor taken from the frame until the plungers have been properly manipulated.

5. The combination, with the supporting-box, of the pivotally-mounted disk and the movable plungers under spring-tension therein, the said disk being provided with working and blocking surfaces, and the said plungers with projections for engaging therewith, substantially as and for the purpose set forth.

6. The combination, with the box, of the pivotally-mounted disk and the sliding plungers therein, the elastic cords attached to the movable parts and to the box for placing the movable parts under spring-tension, the said plungers being provided with projections and the said disk having working teeth, blocking-teeth, and deceiving-teeth engageable by said projections, substantially as and for the purpose set forth.

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

GEORGE A. GOODSON.

Witnesses:

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E. F. ELMORE.