

No. 691,828.

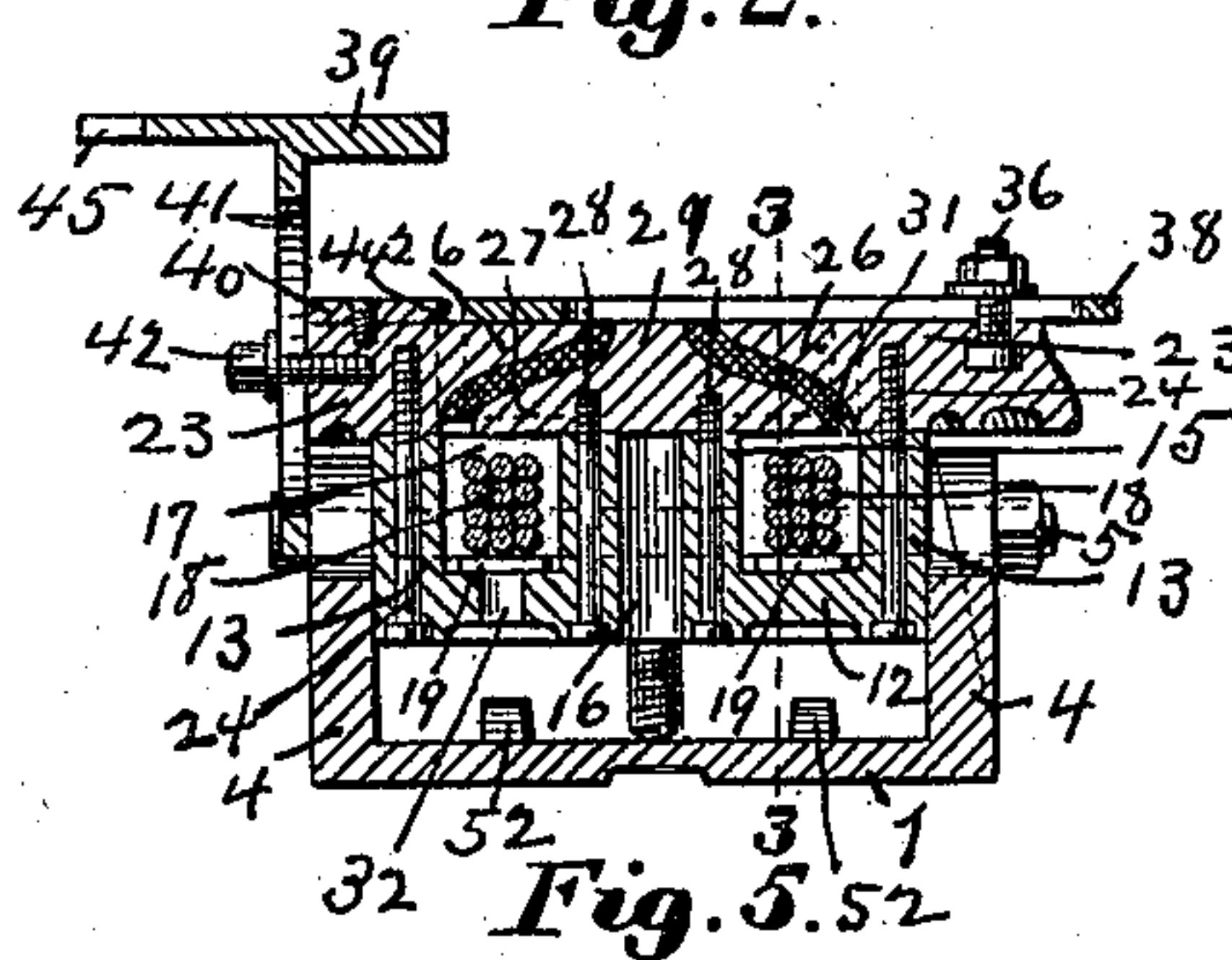
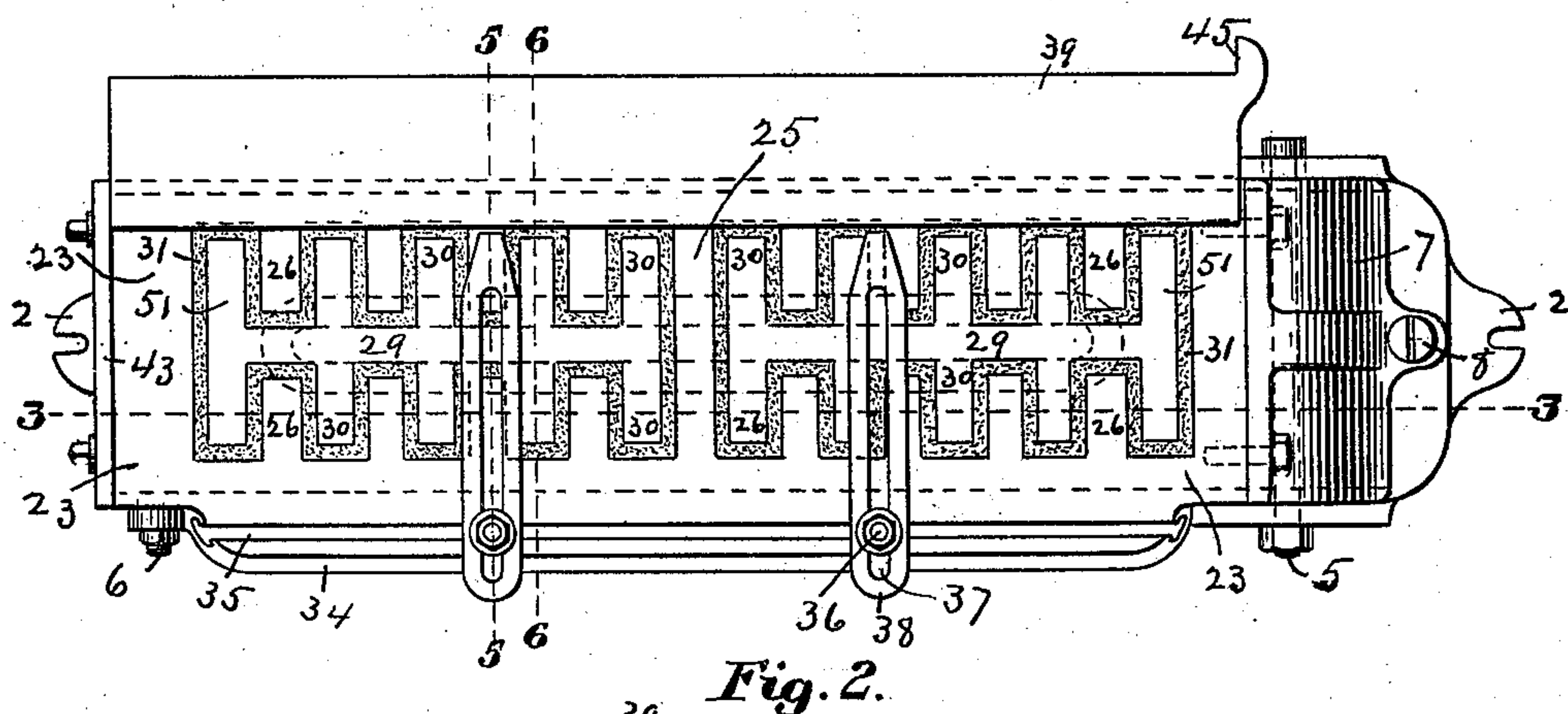
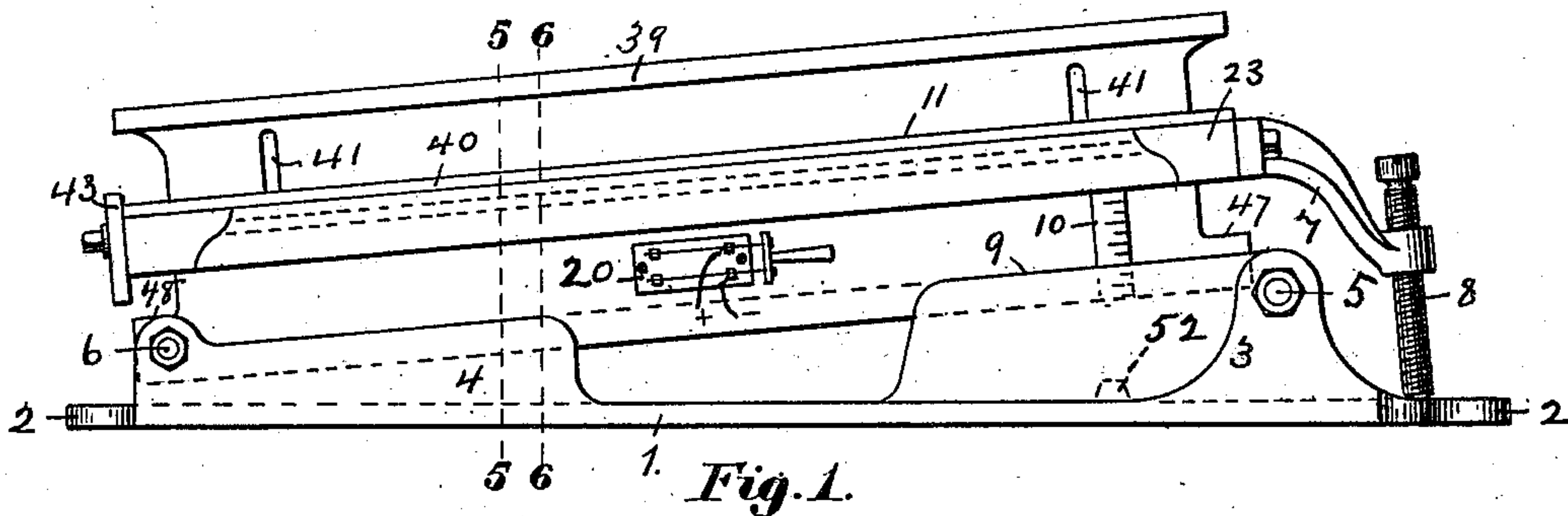
Patented Jan. 28, 1902.

O. S. WALKER.
MAGNETIC CHUCK.

(Application filed Jan. 10, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

Walter C. Lombard
A. T. Murphy

Inventor:

Oakley S. Walker
by Rufus B. Fowler
Atty.

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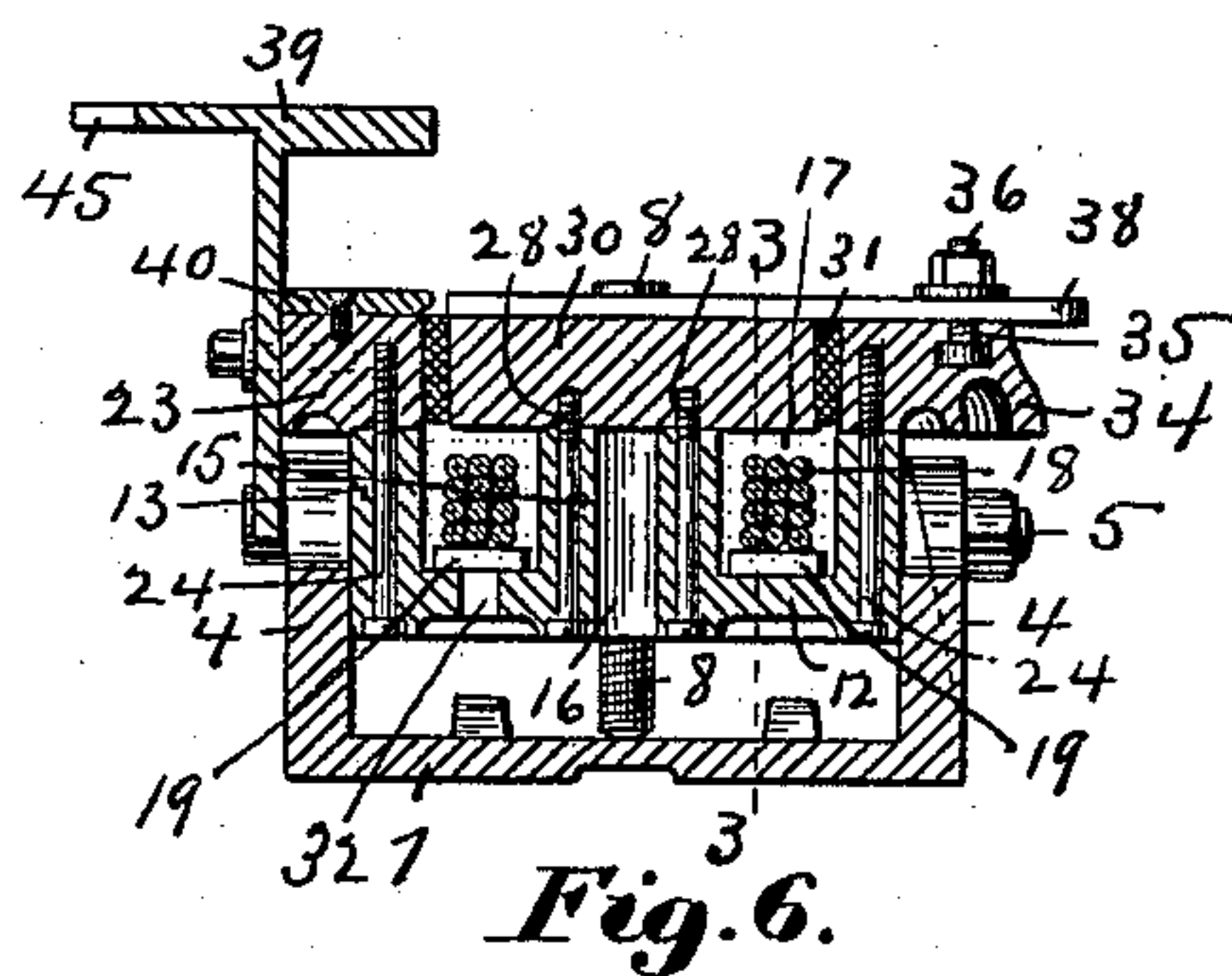
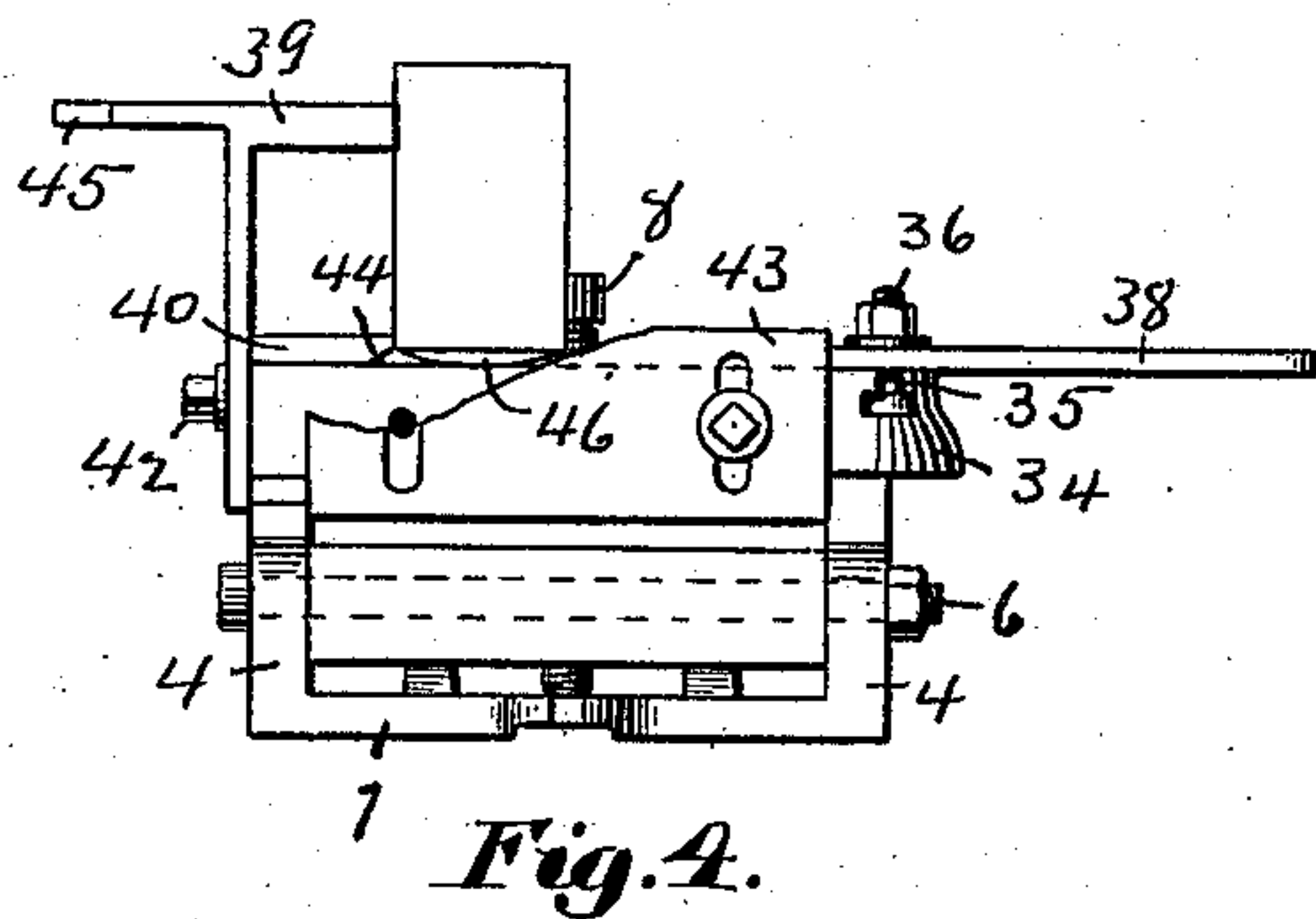
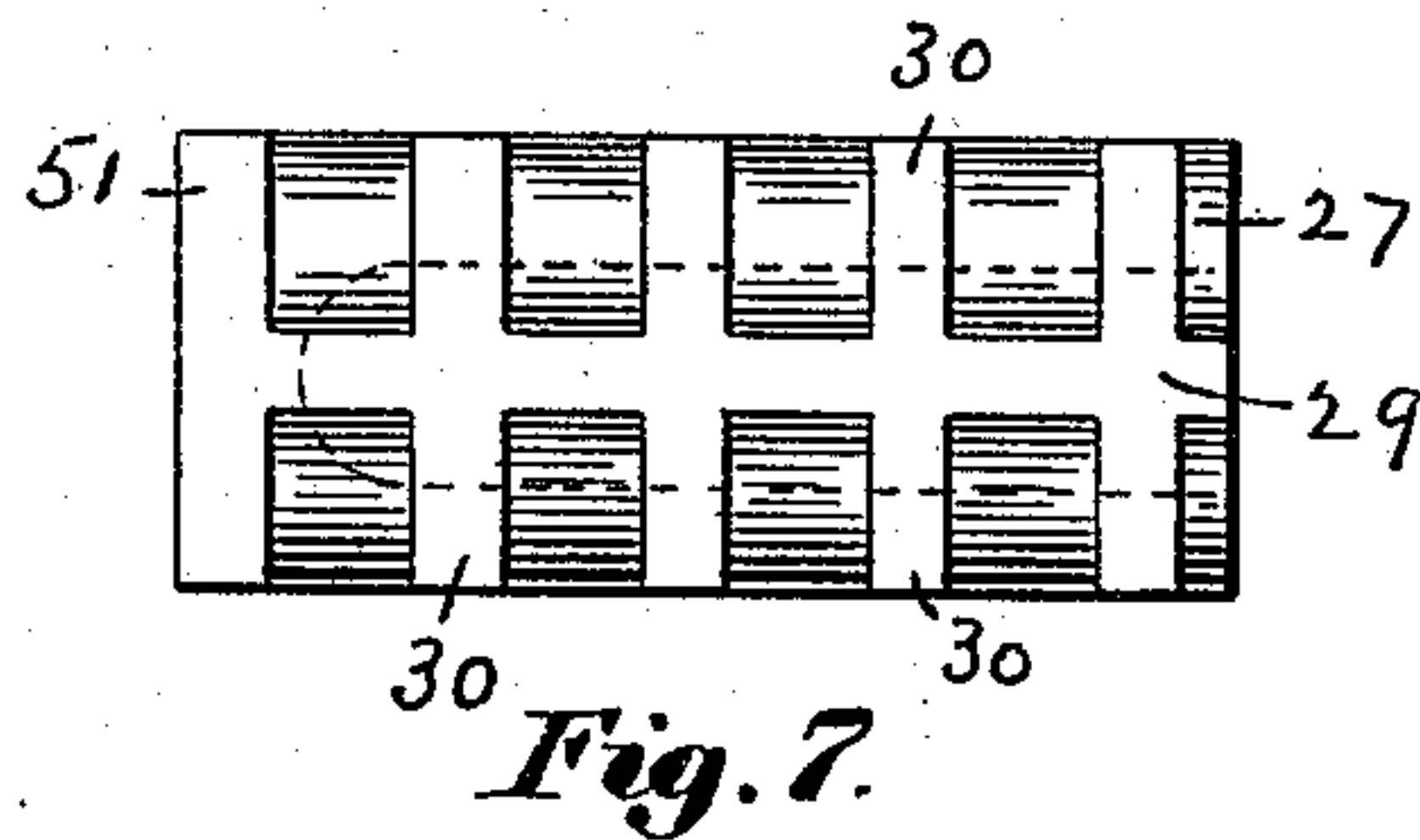
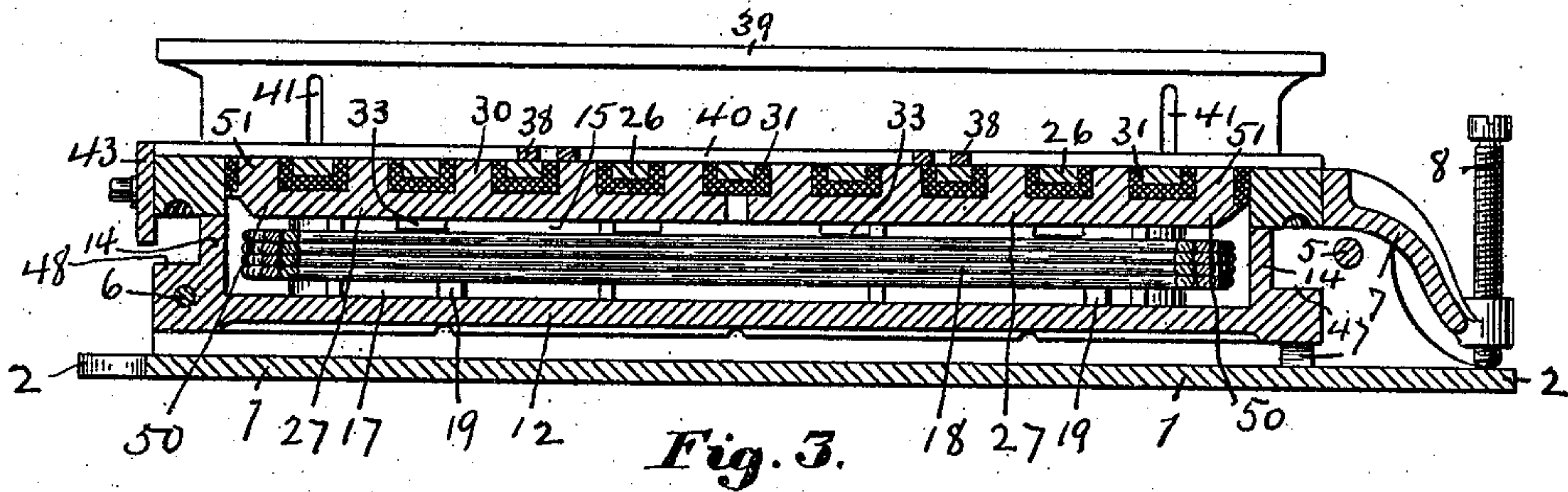
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2 Sheets—Sheet 2.



Witnesses:
Walter E. Lombard
Ava T. Murphy.

Inventor:
Oakley S. Walker
by Rufus B. Fowler
Atty.

UNITED STATES PATENT OFFICE.

OAKLEY S. WALKER, OF WORCESTER, MASSACHUSETTS.

MAGNETIC CHUCK.

SPECIFICATION forming part of Letters Patent No. 691,828, dated January 28, 1902.

Application filed January 10, 1900. Serial No. 939. (No model.)

To all whom it may concern:

Be it known that I, OAKLEY S. WALKER, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Magnetic Chucks, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, in which—

Figure 1 represents a side elevation of a magnetic chuck embodying my invention, with the body of the chuck shown in a tilted position. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal sectional view on line 3 3, Fig. 2. Fig. 4 is an end view. Fig. 5 is a transverse sectional view on line 5 5, Fig. 2. Fig. 6 is a transverse sectional view on line 6 6, Fig. 2; and Fig. 7 is a detached view of one of the tie-plates and interlocking teeth integral therewith, which are attached to the central core of the chuck.

Similar reference-figures refer to similar parts in the different views.

The object of my present invention is to increase the power, efficiency, and utility of a magnetic chuck; and it consists in the construction and arrangement of parts, as hereinafter described, and set forth in the annexed claims.

In the accompanying drawings I have represented a magnetic chuck adapted to be used upon the bed of a metal-planing machine, with the body of the chuck pivoted upon a base-plate or shoe adapted to be fastened upon the platen of a planer, with means for tilting the body of the chuck so as to vary the face of the chuck upon which the work is held from a horizontal position parallel to the platen of the planer to an inclined position, in which the face of the chuck is placed at an angle to the surface of the platen.

Referring to the drawings, 1 denotes a base-plate or shoe adapted to rest upon the platen of a metal-planing machine and provided with lugs 2, by which it is attached thereto. The base-plate or shoe is provided with sides 3, which are united by a tie-bolt 5, and with sides 4, which support a bolt 6, on which the body of the chuck is pivoted near the bottom of one end, allowing the body of the chuck to be raised or lowered in order to vary the posi-

tion of the face of the chuck. To the opposite end of the chuck-body I attach a curved plate 7, carrying an adjusting-screw 8, which rests upon the base-plate or shoe and serves to vary the inclination of the chuck. The upper edge 9 of the sides 3 coincide with a line passing through the center of the pivotal bolt 6 and serves as an indicator in connection with a graduated scale 10 on the body of the chuck to show the inclination of the face 11 of the chuck.

The chuck proper consists of a rectangular shell or box having a bottom 12, sides 13, ends 14, and a central core 15, all cast in a single piece, with a central opening 16 extending through the core, said opening corresponding to the shape of the core, so that the mass of metal around the central opening will be of uniform thickness. The space 17 between the central core 15 and the outer sides of the chuck forms a space for a coil of insulated wire 18, resting upon wooden blocks 19, with preferably an air-space surrounding the coil. The coil of wire 18 is electrically connected by means of a switch 20, Fig. 1, with wires 21 and 22, which communicate with a dynamo and form part of an electric circuit, by which the core 15 becomes magnetized, forming an electromagnet. The top of the box or shell is provided with a cover formed in the present instance of three parts. The first part consists of a plate 23, which is attached to the outer sides of the box or shell by means of bolts 24. The plate 23 is considerably larger than the box or shell and overhangs it upon its sides and ends and is provided with a central opening, which is divided into two parts by a cross-bar 25, and projecting into the central opening upon each side are a series of teeth 26. The second and third parts of the cover consist of duplicate plates 27, attached by bolts 28 to the central core and provided with a central rib 29, and projecting from each side of the rib 29 are a series of teeth 30, the teeth 30 and rib 29 being cast integrally with the plate 27, which serves as a tie-plate. The rib 29 is placed midway between the ends of the projecting teeth 26, and the teeth 30 interlock with the teeth 26, which are reduced in thickness at their free ends and project over the edges of the tie-plate 27. A space is left between

those portions of the cover which are attached to the core 15 and that portion of the cover which is attached to the outer sides 13, which space is preferably filled with Babbitt metal 5 31 or some non-magnetic material.

The cover, constructed as above described, is placed upon the box or shell and attached by bolts to the sides 13 and the central core 15, forming an inclosed chamber 17 around 10 the central core 15, in which is placed the coil of wire 18. The necessary ventilation of the coil-chamber 17 is secured by means of a series of small openings through the bottom, one of which is shown at 32, Fig. 5, and by a 15 central opening 16 in the core, which communicates with the coil-chamber 17 by means of several small openings at the top of the core, as shown at 33, Fig. 3, thereby providing for a free circulation of air through the 20 coil-chamber 17. The cover overhangs the sides 13, so that soda-water or other liquid applied to the cutting-tool of the planer will flow off the face of the chuck and outside the shoe, and one side of the cover has a projec- 25 tion 34, which extends over the switch 20, and is provided on its upper surface with a T-slot 35 to receive the heads of bolts 36, which pass through slots 37 in adjustable fingers 38 38, which are adapted to be brought 30 against the side of the work held upon the face of the chuck and hold it in contact with a side rest 39 and with the edge of a steel strip 40, attached to the face of the chuck. The side rest 39 is T-shaped and provided 35 with slots 41 to receive clamping-bolts 42, by which it is attached to the side of the cover, and is vertically adjustable thereon. Upon one end of the chuck is attached a vertically- 40 adjustable plate 43, which serves as an end stop to hold the work from longitudinal movement. The edge of the strip 40 is preferably undercut, as at 44, in order that dirt and chips, which would interfere with the contact 45 of the work with the strip 40, may be cleared away. The side rest is provided on one edge with a projecting shoulder 45, adapted to receive the end thrust of the work when the side rest is turned end for end from the position shown in Figs. 1 and 2. When work 50 of considerable thickness is to be planed, I support the work upon a thin segmental strip or rocker 46, Fig. 4, in order to allow the side of the work to bear equally against the strip 40 and the side rest 39. The opposite ends of the box or body portion of the 55 chuck are provided with shoulders 47 48, so that the chuck may be removed from the shoe and clamped by the shoulders 47 48 upon the platen of the planer, and the opposite ends 60 of the cover are made to project as far as the shoulders 47 48 in order to allow two or more chucks to be removed from their shoes and placed upon the platen of the planer end to end, with the ends of the covers in contact 65 with the faces of the chucks continuous, so they may be used as a single chuck. When

the chuck is to be used in a horizontal position, as shown in Fig. 3, the adjusting-screw 8 may be withdrawn, allowing the chuck to rest upon spurs 52, projecting upwardly from 70 the base-plate or shoe.

It is not broadly new to construct a magnetic chuck with interlocking teeth having spaces between them filled with Babbitt or other non-magnetic metal and adapted to be 75 spanned by the work placed upon the face of the chuck; but such chucks have usually been made with the top integral with the body portion of the chuck, leaving the bottom open for the admission of Babbitt metal to the 80 spaces between the interlocking teeth of the chuck and also to admit the coil of insulated wire. This method of construction makes it inconvenient to swage the non-magnetic 85 metal into the gaps or spaces between the interlocking fingers. By my improved construction I cast the bottom integral with the sides and make the cover removable, which affords ample access for the introduction of the Babbitt metal, and I make those portions of the 90 cover which are attached to the core considerably wider than the core, so they will extend beneath the fingers 26, thereby increasing the magnetic action of the chucks at the sides or near the outer edges of the face. 95 That portion of the cover formed by the tie-plates 27 is made in sections, two such sections being shown in the chuck represented in the accompanying drawings, so that the teeth of each section may be made to register 100 more accurately with the interlocking teeth 26 by independently adjusting each section to compensate for any irregularity due to unequal shrinkage in casting, and each of the tie-plates 27 projects beyond the end of the 105 core, as at 50, Fig. 3, in order to support the teeth 51 over the core-chamber.

I provide the base-plate or shoe with spurs 52, beneath the free end of the chuck, of the proper height to support the free end of the 110 chuck, with the face 11 in a horizontal position when the base-plate or shoe is placed upon the platen of the planer.

What I claim as my invention, and desire to secure by Letters Patent, is— 115

1. In a magnetic chuck the combination with a box or shell containing a central core forming a part of said box or shell and provided with an intervening space between the 120 outer walls of said box or shell and the central core for a coil of wire, a coil of wire contained in said space and forming part of an electric circuit, and a removable cover made in separate magnetic parts with intervening spaces between said parts, one of said parts 125 being magnetically connected with said central core and the other with the outer walls of said box or shell, substantially as described.

2. In a magnetic chuck, the combination of a box, or shell, having a central core, a cover 130 removably attached thereto and consisting of a plate attached to the outer walls of said box,

or shell, and provided with a central opening, a tie-bar uniting the opposite sides of said plate and dividing said central opening and plates inserted in said central opening on opposite sides of said tie-bar and attached to said core with an intervening gap, or space, between the plates attached to the core and the plate attached to the walls of said box, substantially as described.

3. In a magnetic chuck, the combination with a box, or shell, having a central core and a removable cover comprising a plate attached to the walls of said box, or shell, and provided with a central opening, two or more plates attached to said core and held in said central opening, said plates having interlocking teeth separated by an intervening gap, or space, substantially as described.

4. In a magnetic chuck, the combination with a box, or shell, having a central core, of a tie-plate attached to said central core and projecting upon opposite sides of said core, laterally-projecting teeth integral with said tie-plate, a plate attached to the outer walls of the box, or shell, and a series of teeth integral with said plate, said teeth projecting over the edges of said tie-plate and alternating with said tie-plate teeth, substantially as described.

5. In a magnetic chuck, comprising a box, or shell, having a central core, a plate attached to said central core and projecting longitudinally beyond the end of said core, and a pair of teeth supported by the projecting end

of said plate and extending laterally in opposite directions, substantially as described.

6. In a magnetic chuck, the combination of a box, or shell, having a central core, a cover consisting of a plate magnetically connected with said box, or shell, and provided with an opening and a series of inwardly-projecting teeth having rectangular ends, a plate magnetically connected with said central core and provided with a central longitudinal rib and a series of laterally-projecting teeth provided with rectangular ends and interlocking with said inwardly-projecting teeth, with an intervening non-magnetic space between said interlocking teeth, that at the sides of the teeth being at right angles to said central rib and that at the ends of the teeth being parallel therewith, substantially as described.

7. In a magnetic chuck, the combination of a box, or shell, containing a chamber for a coil of wire, a coil of wire held in said chamber and forming part of an electric circuit and a central core forming a part of said box, or shell, and having a central opening communicating with said coil-chamber, substantially as described.

In testimony whereof I have signed my name to this specification, in presence of two subscribing witnesses, this the 5th day of January, 1900.

OAKLEY S. WALKER.

Witnesses:

RUFUS B. FOWLER,
AVA T. MURPHY.