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Patented Dec. 3, 1901.

M. BARR.

MAGNETIC HOLDING TABLE FOR METAL WORKING MACHINES.

(Application filed Aug. 6, 1900.)

(No Model.)

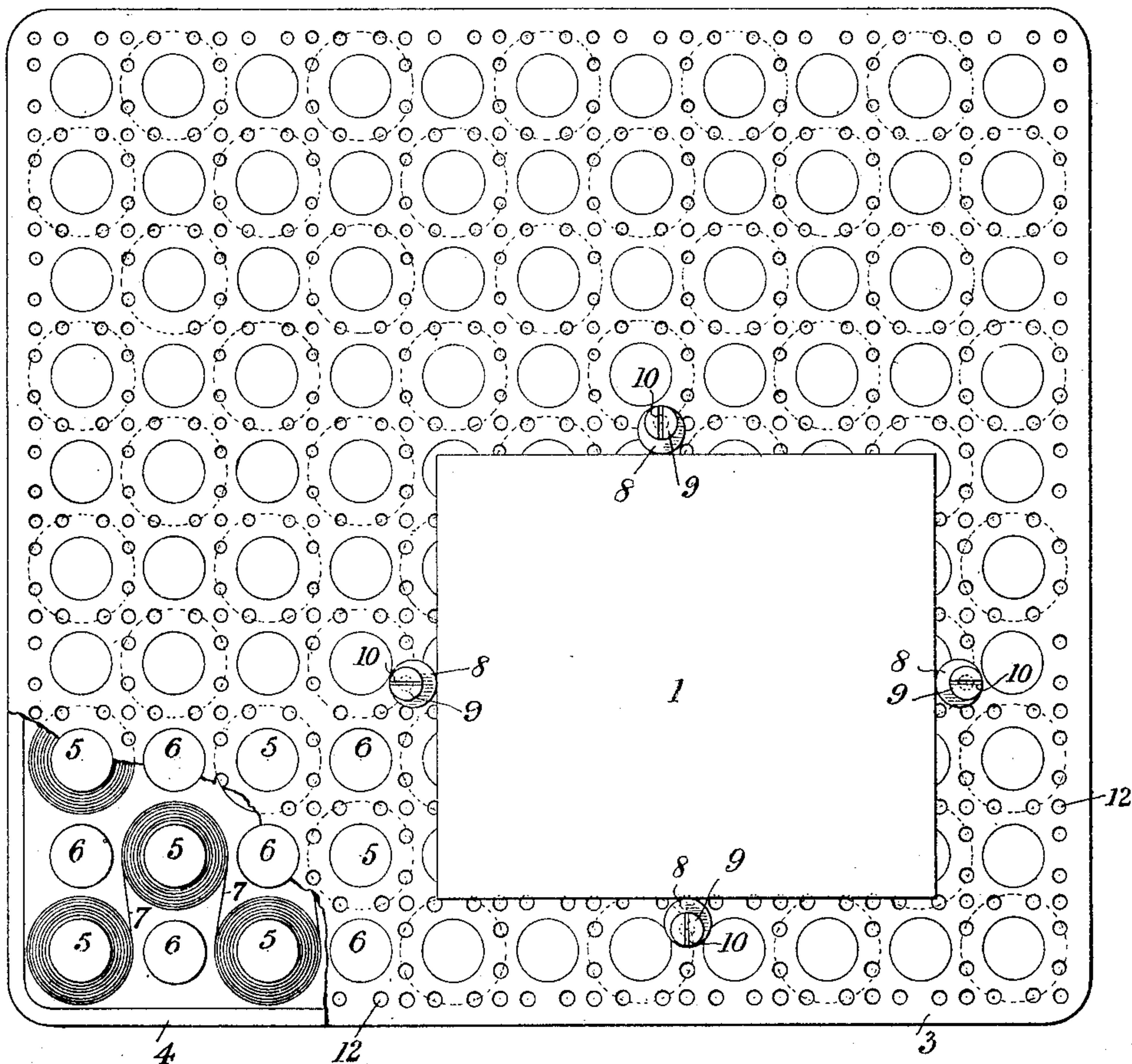


Fig. 1.

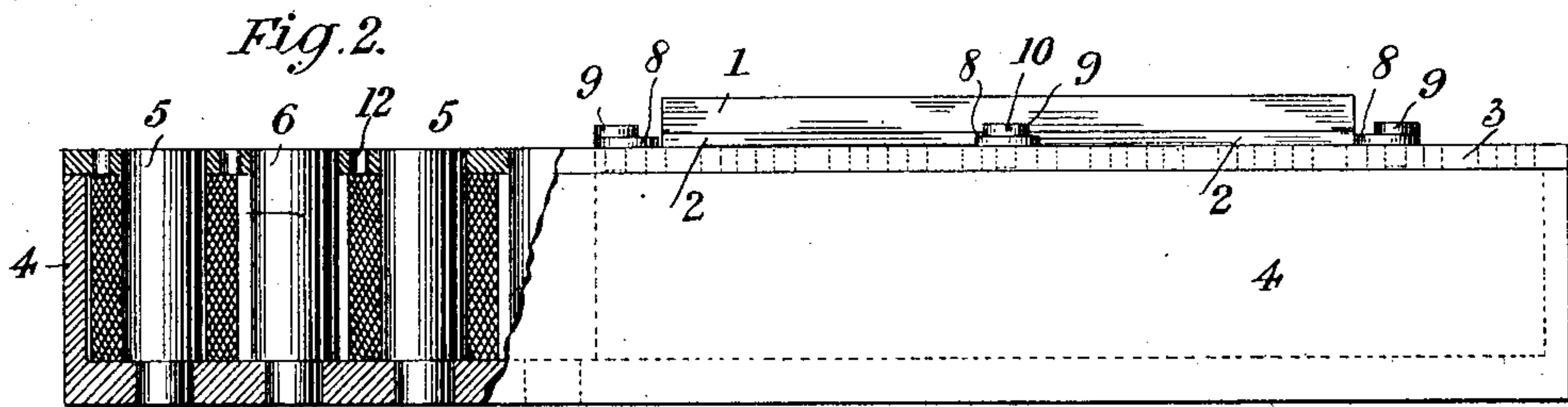
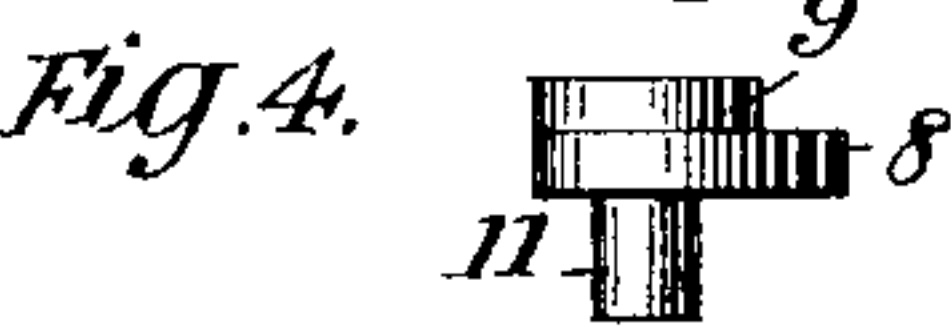
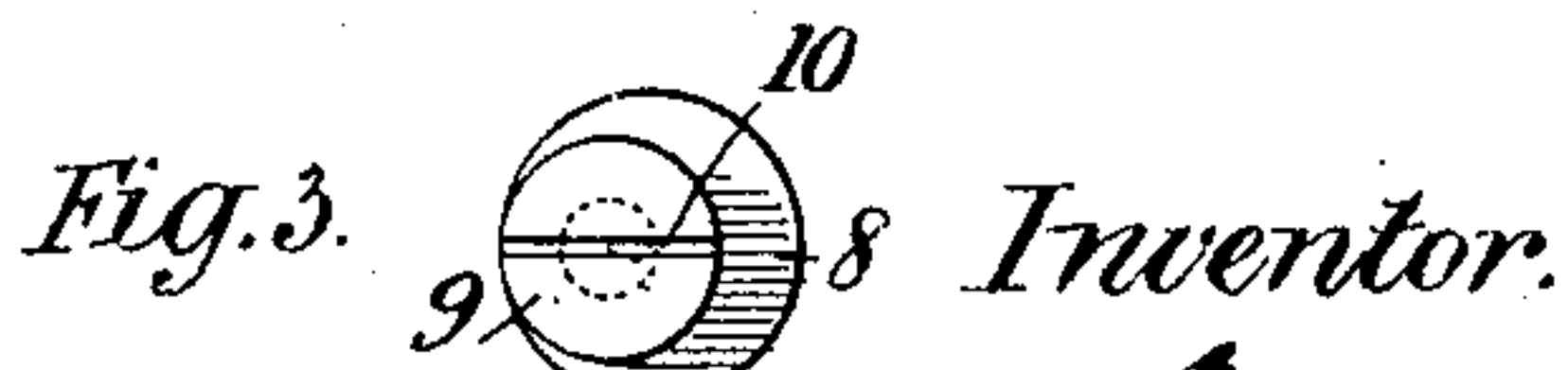


Fig. 2.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## MAGNETIC HOLDING-TABLE FOR METAL-WORKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 687,931, dated December 3, 1901.

Application filed August 6, 1900. Serial No. 26,074. (No model.)

*To all whom it may concern:*

Be it known that I, MARK BARR, of Broadheath, in the county of Chester, England, have invented certain new and useful Improvements in Magnetic Holding-Tables for Metal-Working Machines; 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.

The present invention relates to improvements in magnetic holding-tables for metal-working machines, and is especially applicable to holding flat metal articles down upon such tables.

It consists in certain novel improvements which make the table simpler, more efficient, and cheaper than those hitherto known, which improvements are hereinafter described at length and claimed.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is a plan of an improved table after a corner of its top has been broken away to show the interior, having a flat brass plate held down upon it; Fig. 2, a sectional side elevation corresponding with Fig. 1; Fig. 3, a plan, and Fig. 4 a side elevation, of a holding-cam.

1 is the article to be held. It may be of any material, shape, or size; but it must be firmly mounted upon a flat iron or steel plate 2 of an area not smaller than its own and thick enough for the holding-cams to bear against. The plate 2 is preferably flat to rest evenly upon the table-top 3, for the flatter it is the greater will be the number of holding-points between it and the said top. It is of iron or steel, because of the superior magnetic properties of these metals. The table-top 3 is flat and of brass, because that metal is not magnetic. It fits down upon a box 4. The material of this box is iron or steel, because of the magnetic properties of these metals. Within the box 4 are arranged two series of magnetic poles 5 6 in such a way that each pole of one series—say series 5—is N to all the poles of the other series 6, which are consequently S to it. Accordingly only alternate poles 5 are wound, the poles of the other series 6 being unwound. It is a mat-

ter of indifference whether the poles of the series 5 are wound in parallel or series so long as the winding 7 is continuous throughout the series. The pole-pieces of both series are screwed or otherwise made fast in the bottom of the box 4 without being insulated therefrom, standing up straight within the said box, as shown in Fig. 2, and presenting their top ends through the brass table-top 3, with the top surface of which they are flush, as shown.

As soon as the current is switched into the windings 7 the coils 5 are energized, and magnetic currents pass from each pole 5 to each pole 6 or from each pole 6 to each pole 5, according to the direction of winding and current, and as the poles 5 and 6 alternate each other in directions parallel with the sides and ends of the box the magnetic flux is of equal intensity in every direction. When the plate 2 is laid upon the top 3, it will touch a certain number of pole-pieces 5 and 6 and so form a part of a corresponding number of magnetic circuits, which will hold it down upon the said top 3 accordingly. At the same time the plate 2 can be moved over the top 3 in any direction, and to prevent such motion when it is not wanted holding-cams 8 are provided. A cam 8 has a head 9, with a notch 10 across it on the top side of it and a pin projecting from the bottom side of it. 12 12 are a series of holes in the table-top 3 clear of the poles 5 and 6, in which the cam-pins 11 can fit and turn. These holes 12 are preferably in rows between the rows of poles, as shown in Fig. 1, and the cams 8 of a sufficient eccentricity to bear against the edge of the plate 2 when they are turned on their pins toward it by a screw-driver inserted in the notches 10.

I claim—

1. The hereinbefore-described combination of box of magnetic material; cover of non-magnetic material; series of wound pole-pieces electrically connected with the box; series of unwound pole-pieces electrically connected with the box and both flush with the top surface of the box-cover; and continuous winding on all the wound pole-pieces.

2. The hereinbefore-described combination of box of magnetic material; cover of non-magnetic material; series of wound pole-

pieces electrically connected with the box; series of unwound pole-pieces electrically connected with the box, both flush with the top surface of the box-cover, a wound pole alternating an unwound one in every direction and  
5 a continuous winding on all the pole-pieces.  
In testimony that I claim the foregoing as

my invention I have signed my name in presence of two subscribing witnesses.

MARK BARR.

Witnesses:

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