

(No Model.)

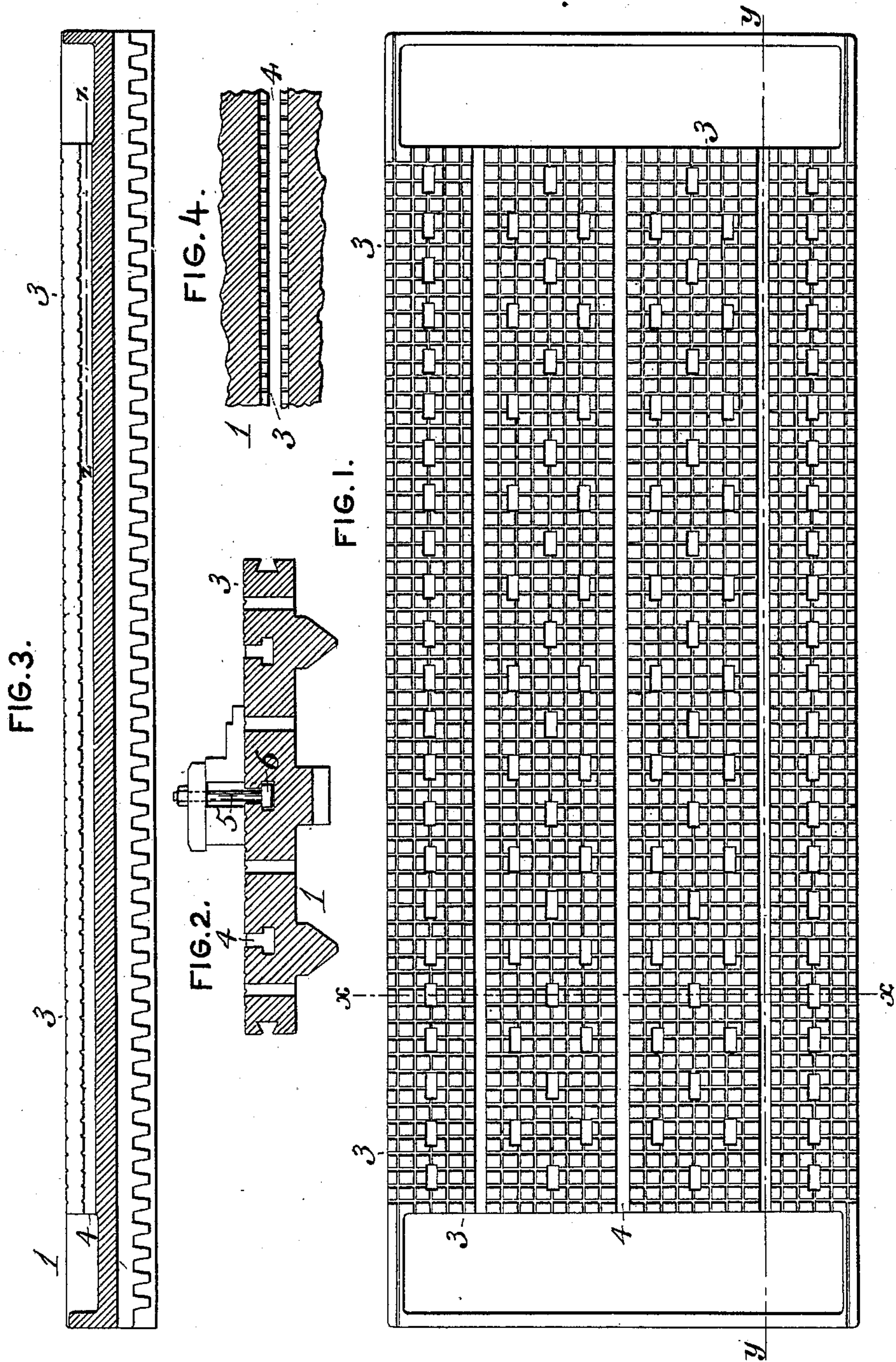
2 Sheets—Sheet 1.

F. W. TAYLOR.

METALLIC TABLE FOR MACHINE TOOLS.

No. 359,369.

Patented Mar. 15, 1887.



ATTEST.

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FIG. 10.

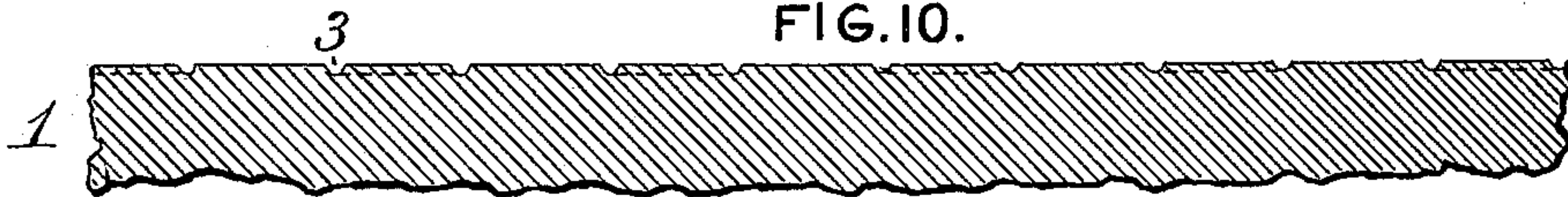


FIG. 9.

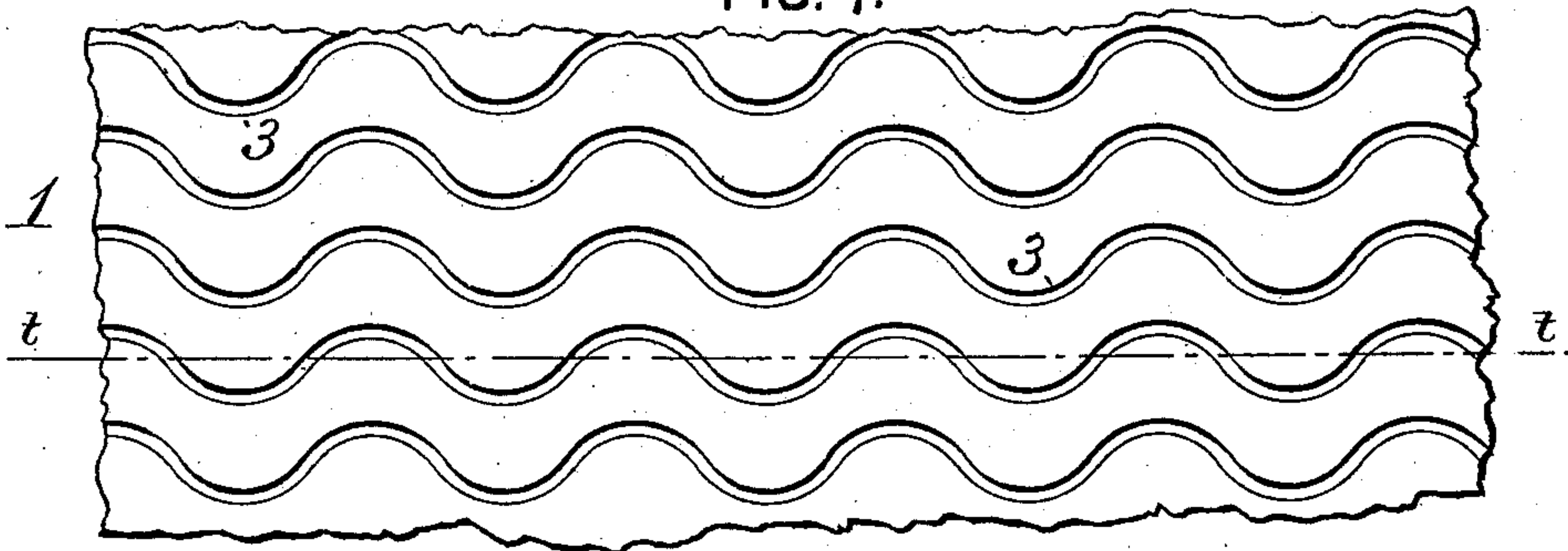


FIG. 8.

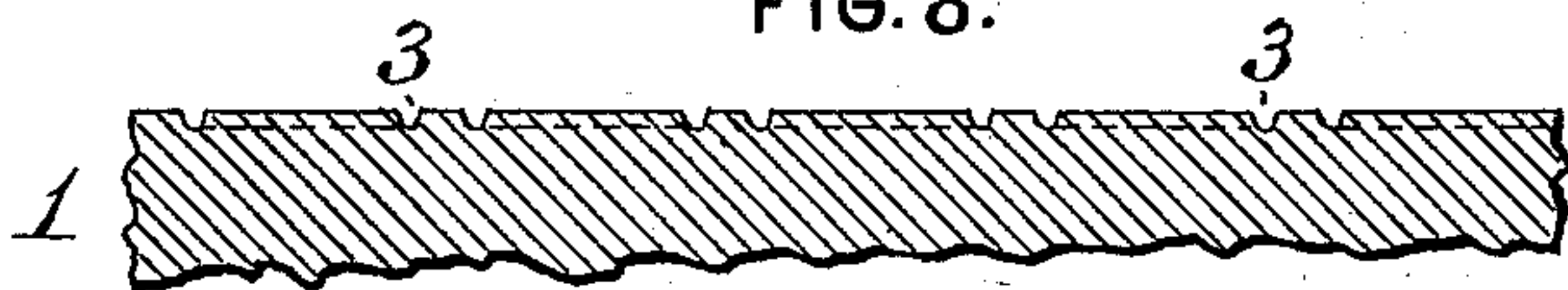


FIG. 7.

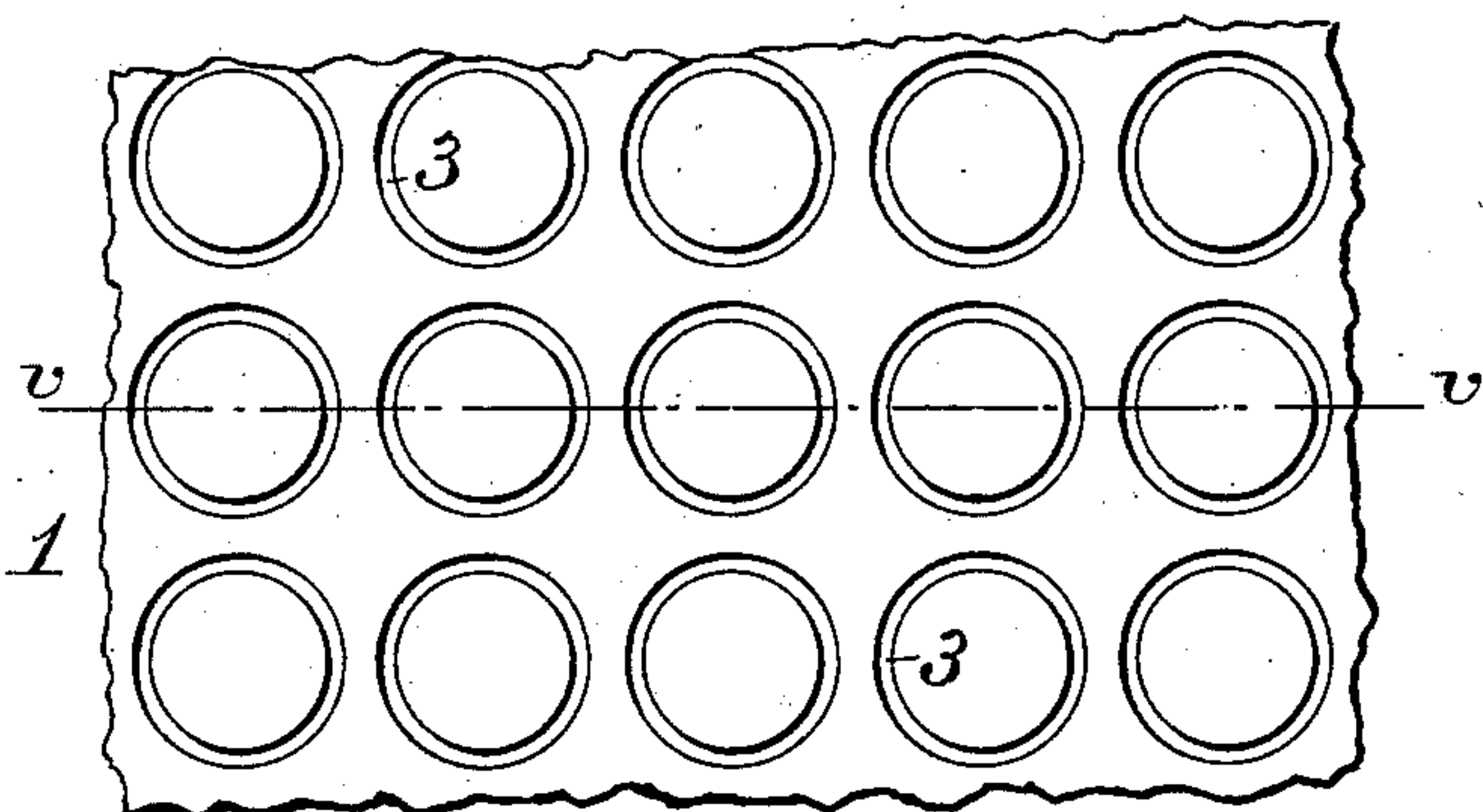
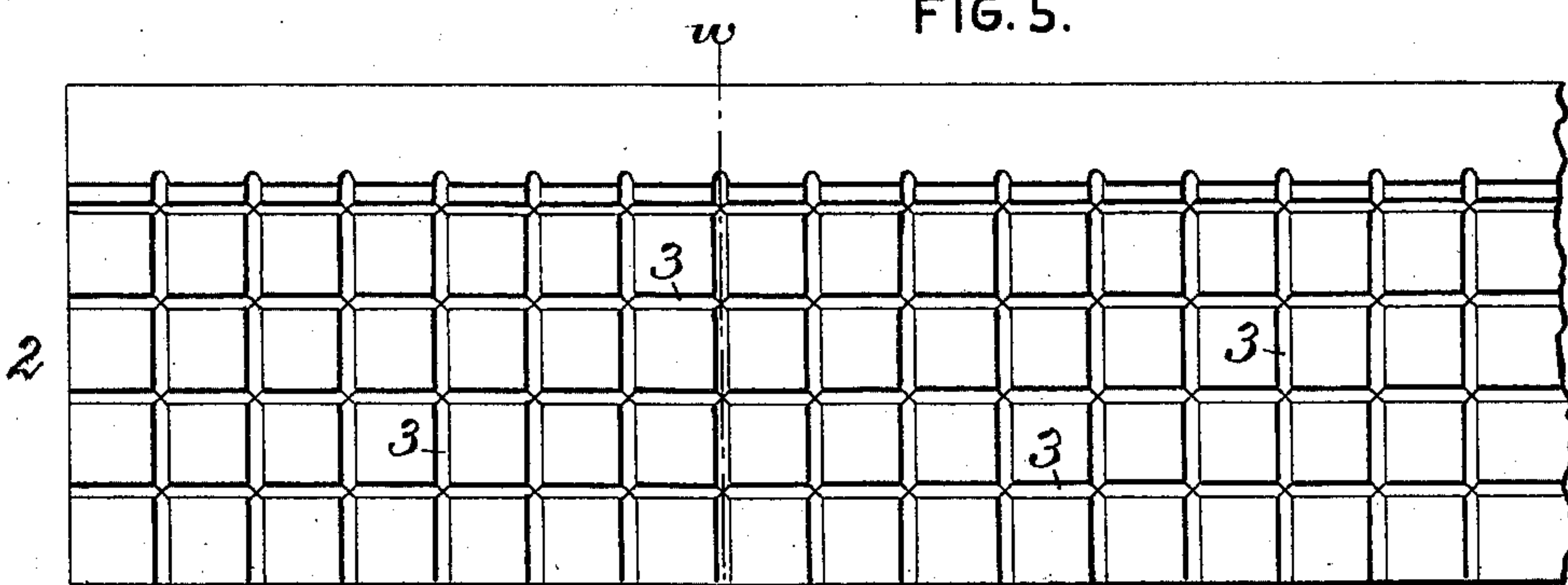


FIG. 6.



FIG. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK W. TAYLOR, OF PHILADELPHIA, PENNSYLVANIA.

METALLIC TABLE FOR MACHINE-TOOLS.

SPECIFICATION forming part of Letters Patent No. 359,369, dated March 15, 1887.

Application filed July 7, 1886. Serial No. 207,341. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. TAYLOR, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain
5 new and useful Improvement in Metallic Tables or Face-Plates for Machine-Tools, &c., of which improvement the following is a specification.

My invention relates to tables, face-plates,
10 and other plane surfaces to which the work or piece of metal to be acted on by an appropriate tool is fastened in planing-machines, drill-presses, slotting, boring, or turning machines, and other machine-tools, as well as to straight-
15 ening or surface plates for holding metals while being straightened by hammering with sledges or mallets.

The object of my invention is to prevent the surfaces of said tables or plates from curving
20 or arching upwardly under the action of the tool applied in working the metal held thereon.

To this end my invention, generally stated, consists in a metallic table or plate for holding metal, having the whole or any desired portion
25 of its surface on which the work rests, or against which clamping-bolts abut, traversed by a series of grooves or channels, which are located in any desired number and relation upon the surface of the table or plate, or of
30 the bolt-slots therein, (which surfaces have heretofore been smooth plane surfaces,) in such manner that one or more of said grooves shall be closely adjacent to any part of the table or plate with which it is possible for the work or
35 piece of metal operated on, or a bolt holding the same, to be in contact.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is
40 a plan or top view of a planer-table, illustrating the application of my invention; Fig. 2, a transverse section through the same at the line *x x* of Fig. 1; Fig. 3, a longitudinal section through the same at the line *y y* of Fig. 1;
45 Fig. 4, a partial horizontal section at the line *z z* of Fig. 3; Fig. 5, a plan view of a straightening-plate embodying my invention; Fig. 6, a transverse section through the same at the line *w w* of Fig. 5; Figs. 7 and 9, plan views of portions of tables or plates, illustrating different
50 modifications of my invention; Fig. 8, a lon-

gitudinal section at the line *v v* of Fig. 7, and Fig. 10 a similar section at the line *t t* of Fig. 9.

In operating on metal by tools of different
55 descriptions—as in planing, drilling, slotting, &c.—the piece of metal which is acted on must be held upon and supported by a proper table or plate, and the action of the tool transmits, through the work or piece of metal operated
60 on to the table or plate on which it rests, a series of shocks or blows more or less minute, depending upon the nature of the work being done and the greater or less degree of chattering of the piece. The effect of such minute
65 blows on the surface of the table is topeen or stretch it in the same manner as though it had received a series of blows from the peen of a hammer, and the stretching of the surface of the table or plate induced thereby causes
70 the whole table or plate to arch or curve upwardly, so that its surface assumes a convex form. The surfaces of straightening-plates are peened or stretched in a similar manner, so that the plates arch or curve upwardly into
75 convex form by the action of the blows from the mallets or sledges which are transmitted to the plates through the pieces which are straightened upon them. A further cause of the peening or curving of face-plates and
80 tables is the pressure of the heads of the bolts by which the work is held against the surfaces of the slots or grooves in the table in which said bolts fit, said pressure stretching such surfaces and causing the table to arch or curve.
85

In the peening or curving above referred to, not only are the molecules of metal on the surface of the table or plate caused to assume new positions with relation to one another, by the
90 action of the series of blows which they receive, but also a permanent change is effected in the relative positions of the molecules to a greater or less depth below the surface; or, in other words, the metal below the surface “flows” to a certain depth. The distance below the
95 surface to which this molecular displacement extends will depend upon the character of the work performed upon the piece of metal which is supported on the table or plate in question. Thus, for example, in heavy slotting-machines,
100 in which each cut of the tool transmits a comparatively heavy blow to the table, the perma-

5 nent displacement of the molecules will extend
 to a greater depth below the surface than in
 the case of a light planing-machine, the table
 of which is subject to correspondingly lighter
 10 blows. The effect of this peening or curving
 is to stretch the surface subject to its action
 so that it finally assumes a more or less con-
 vex form, according to the thickness of metal
 beneath the part acted on and the extent of the
 15 peening action, the actual result being that
 the table or plate becomes bent so that the
 side opposite that acted on is concave. To
 prevent such curvature, by affording means of
 admitting of the displacement of the molecules
 20 of metal under the surface action of the tool,
 I form in the surface of the tables or straight-
 ening-plates, by planing, chipping, drilling,
 coring, or any other suitable and known man-
 ner, a series of grooves or channels, extending
 25 in any number, position, form, and relation over
 the surface of that part of the table or plate, or of
 the bolt-slots therein which is subject to such
 peening action, and which I wish to prevent
 from curving. The molecules of metal adja-
 30 cent to these grooves when the surface of the
 table is stretched through the above-men-
 tioned peening action, flow out into the grooves
 and so prevent the whole table from being put
 under a strain, which would cause it to arch
 35 or curve. The exact form of such grooves is
 immaterial; but it is necessary, in order to
 wholly prevent arching or curving, that they
 shall extend to a sufficient depth below the
 surface of the table or plate to be beneath the
 40 lowest point to which a permanent molecular
 displacement or flow of the metal of the ta-
 ble or plate under the action of the tool ex-
 tends, the depth of the grooves and their dis-
 tances apart varying with the thickness of the
 table or plate and the character of the work
 performed upon the piece of metal resting
 upon it.

The grooves may be rectilinear, circular, or
 45 curved, and should be located with sufficient
 closeness to insure that a portion of one or
 more of them shall be included in the area of
 that portion of the table or plate on which
 the smaller as well as the larger pieces of
 50 work will rest in operation. The grooves in
 the bolt-slots, when the same are employed,
 extend into the two surfaces, against which the
 head of the holding-bolt presses when drawn
 to a proper bearing for securing the work to
 the table.

55 Referring to the drawings, Figs. 1 to 4 illus-
 trate the application of my invention in a
 planer-table, 1, which is otherwise of the ordi-
 nary construction. The table is provided, as
 usual, with longitudinal slots 4, which receive
 60 the heads 6 of the clamping-bolts 5, by which
 the work or piece of metal to be placed is se-

cured to the table. A series of shallow grooves
 or channels, 3, is formed (either by being
 cored or cut out) in the surface of the table on
 which the work is supported, said grooves ex- 65
 tending both longitudinally and transversely
 throughout the same, in such proximity one to
 another that a portion of one or more of them
 shall be within the area covered by or closely
 adjacent to any piece of work fixed upon the 70
 table. Similar grooves or channels are formed
 in the surfaces of the slots 4, against which the
 heads of the clamping-bolts bear, as shown in
 Figs. 3 and 4.

My invention is shown in Figs. 5 and 6 as 75
 applied in a straightening-plate, 2, the body
 and side flange of which are each provided
 with shallow rectilinear surface grooves or
 channels 3, similar to those of the planer-ta-
 ble before described. 80

In the modifications illustrated in Figs. 7 to
 10, inclusive, the surface-grooves 3 are located,
 as before, in close proximity one to another,
 but without intersecting, as in the former
 cases, being in circular form in Figs. 7 and 8, 85
 and in adjacent curvilinear form in Figs. 9 and
 10, their specific arrangement and form being,
 as before stated, immaterial.

I claim as my invention and desire to se- 90
 cure by Letters Patent—

1. A metallic table or plate for holding 95
 metal while being operated on by a tool, hav-
 ing its surface traversed by a series of grooves
 or channels in any desired form, number, and
 relation, in such manner that one or more of
 said grooves may be closely adjacent to a part
 of the table or plate which receives the contact
 of the work or piece of metal operated on,
 substantially as and for the purpose set forth.

2. A metallic table or plate for holding 100
 metal while being operated on by a tool, pro-
 vided with slots for clamping or holding down
 bolts, said slots having a series of grooves or
 channels in their surfaces, against which the
 heads of said bolts abut when clamped in po- 105
 sition for holding work upon the table, sub-
 stantially as and for the purpose set forth.

3. A metallic table or plate for holding 110
 metal while being operated on by a tool, hav-
 ing its surface traversed by a series of grooves
 or channels, as described, and being provided
 with slots for clamping or holding down bolts,
 having a series of grooves or channels in their
 surfaces, against which the heads of said bolts
 abut when clamped in position for holding 115
 work upon the table, substantially as and for
 the purpose set forth.

FREDERICK W. TAYLOR.

Witnesses:

GEORGE C. KERWIN,
 JOS. WHITEHOUSE.