L. F. COLL.

STEEL PLATE RIVET HOLE SPACING TABLE.

APPLICATION FILED JUNE 1, 1918.

1,325,191.

Patented Dec. 16, 1919.

4 SHEETS—SHEET 1.

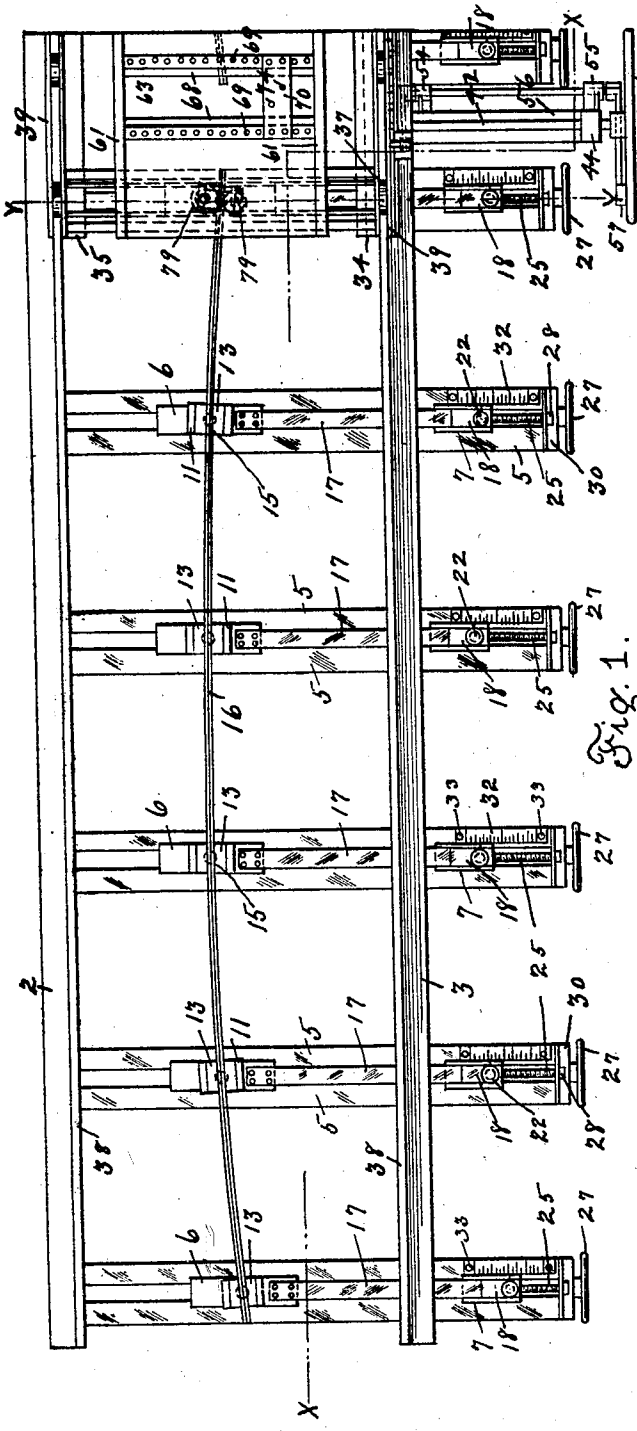


Fig. 1.

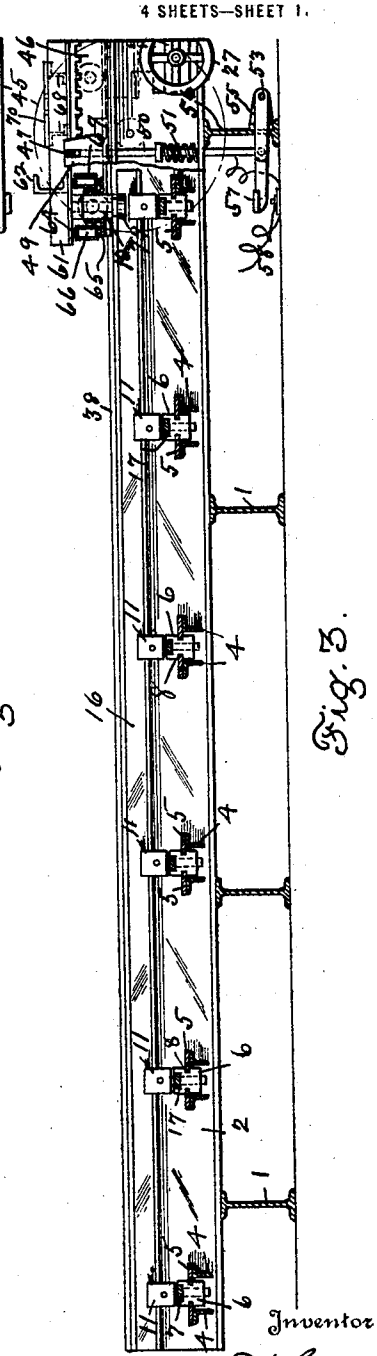


Fig. 3.

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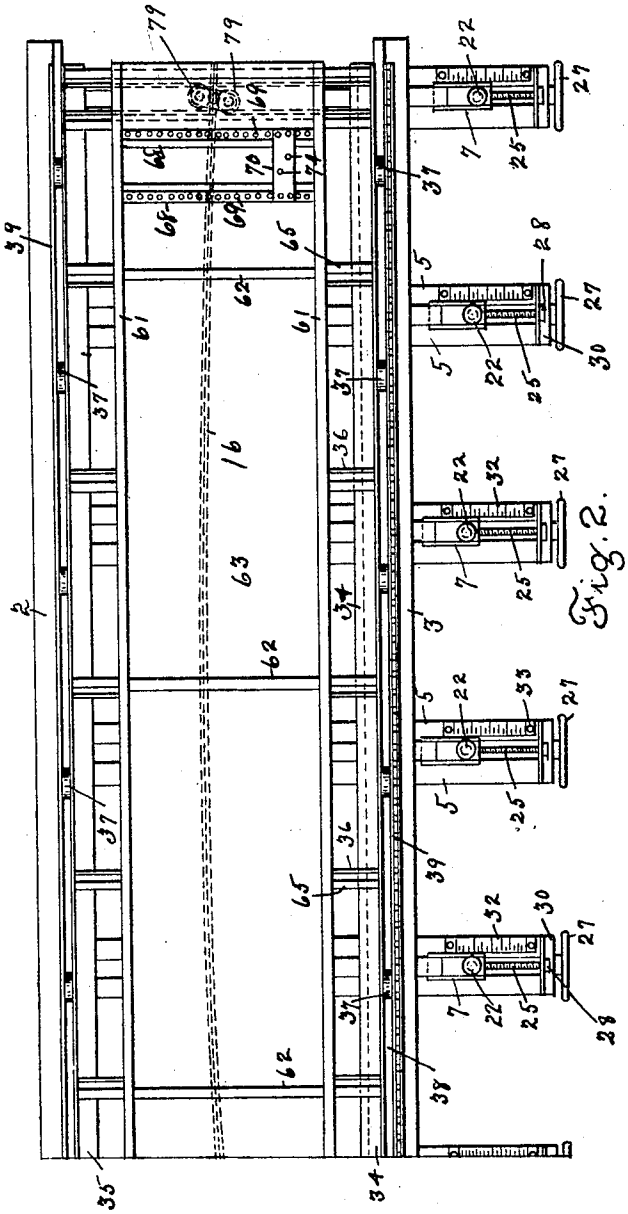


Fig. 2.

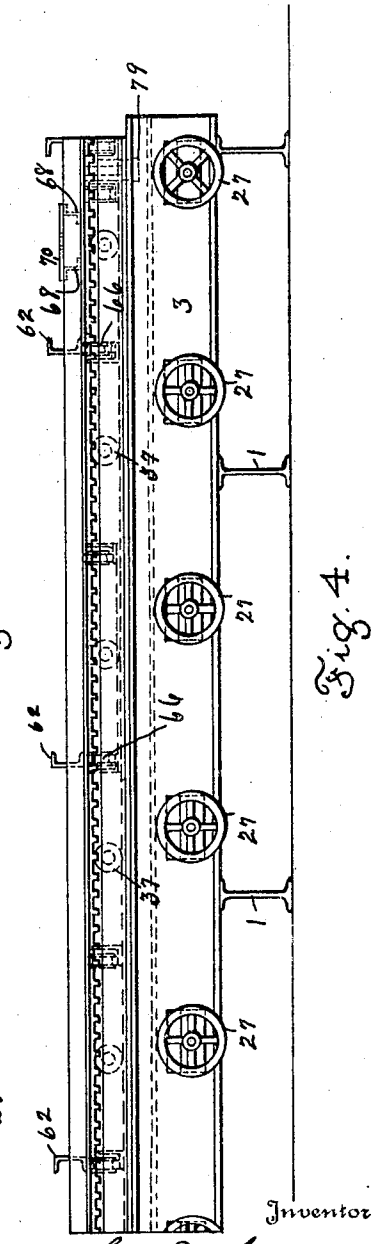


Fig. 4.

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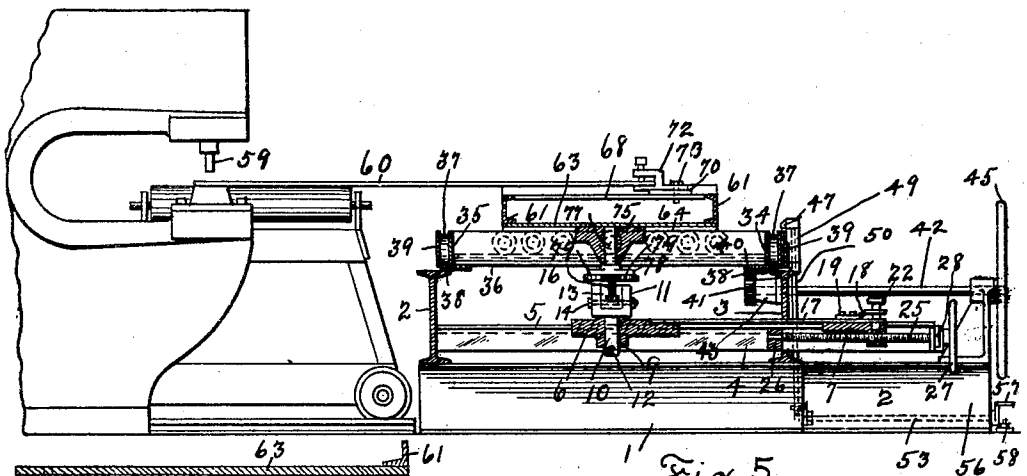


Fig. 5.

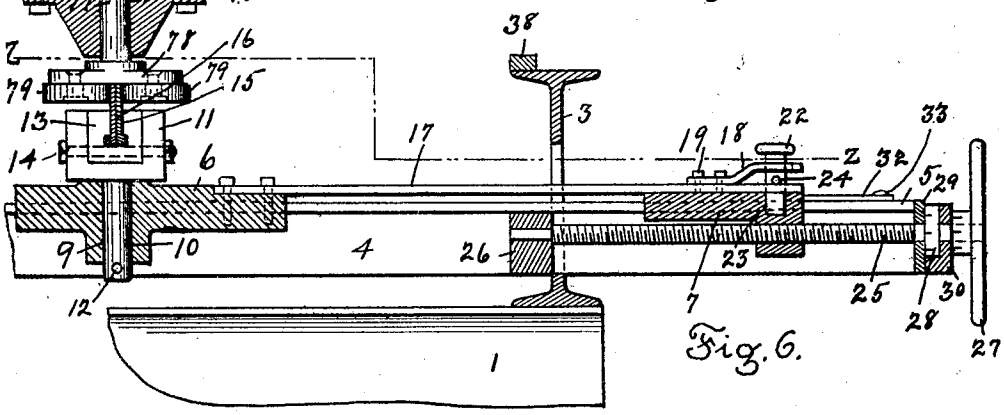


Fig. 6.

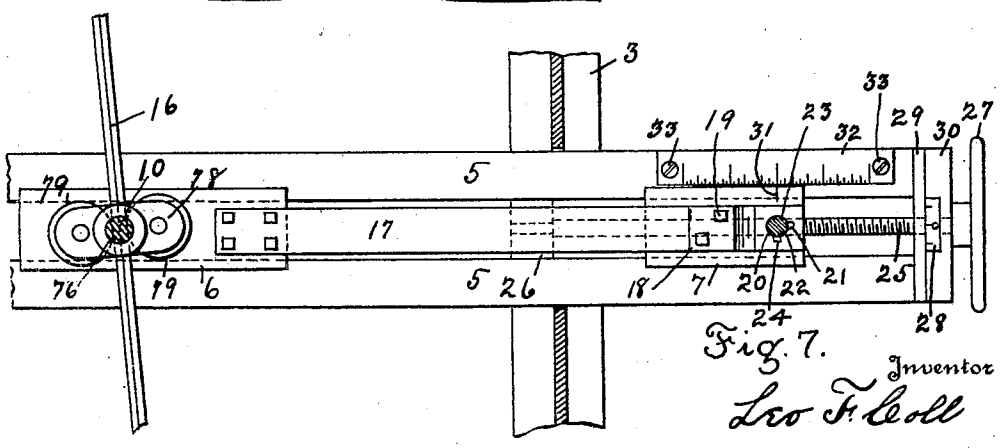


Fig. 7.

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4 SHEETS—SHEET 4.

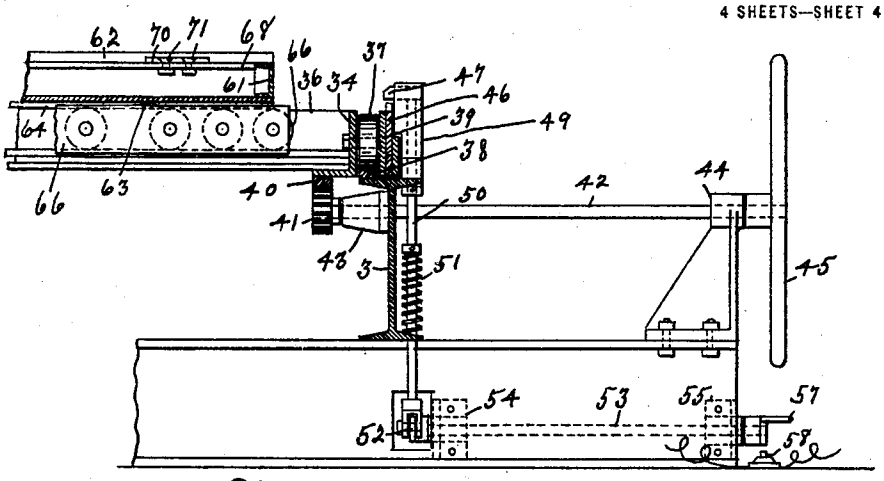


Fig. 8.

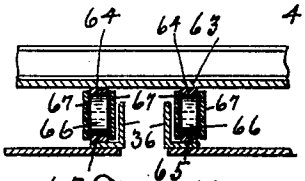


Fig. 11.

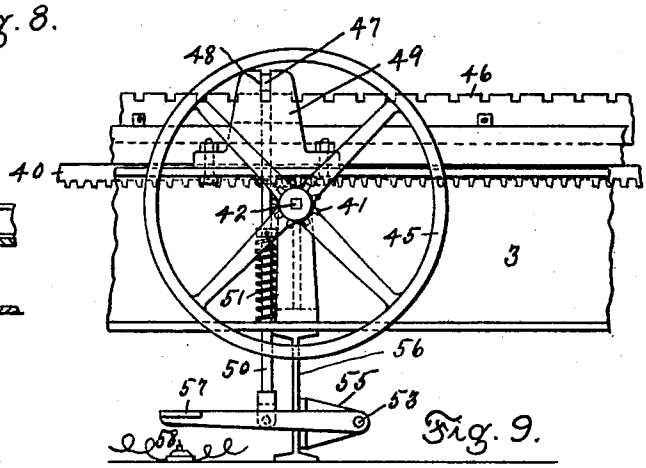


Fig. 9.

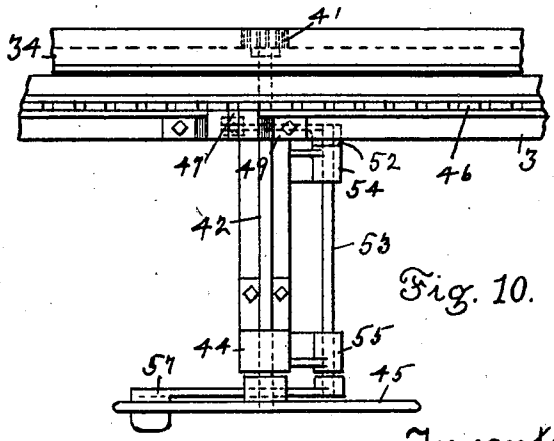


Fig. 10.

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UNITED STATES PATENT OFFICE.

LEO F. COLL, OF BALTIMORE, MARYLAND.

STEEL-PLATE-RIVET-HOLE-SPACING TABLE.

1,325,191. Specification of Letters Patent. Patented Dec. 16, 1919.

Application filed June 1, 1918. Serial No. 237,829.

To all whom it may concern:

Be it known that I, LEO F. COLL, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Steel-Plate-Rivet-Hole-Spacing Tables, of which the following is a specification.

This invention relates to improvements in steel-plate-rivet-hole spacing tables and is especially adapted for use in connection with the preparation of plates for ships.

The object of the invention is to provide a table of such a construction that the plates carried thereby may be fed to the die in such a manner that the rivet holes can be punched on a curve, a straight line, on any desired angle, or staggered, as desired.

The invention consists of the novel construction and arrangement of the parts and combination of parts hereinafter more fully set forth in the following specification and pointed out in detail in the appended claims.

In the accompanying drawings,—

Figure 1 is a plan view of my invention showing one end of the base and a part of the carriage and plate-table.

Fig. 2 is a continuation of Fig. 1 and shows the other end of the base, carriage and plate-table.

Fig. 3 is a vertical section of Fig. 1 taken on the line X—X thereof.

Fig. 4 is a front side elevation of Fig. 2.

Fig. 5 is a vertical section on the line Y—Y of Fig. 1 and shows the position of the plate as it is fed to the die.

Fig. 6 is an enlarged detail section of one of the screws, and its connecting mechanism, for adjusting the curvature or angle of the plate-table guide rails.

Fig. 7 is a sectional plan view of Fig. 6 taken on the line Z—Z.

Fig. 8 is an enlarged detail view of the wheel and mechanism for operating the carriage along the base.

Fig. 9 is a front elevation of Fig. 8, the plate-table being omitted.

Fig. 10 is a plan view of Fig. 9.

Fig. 11 is an enlarged detail view of the tracks and rollers at the ends of the plate-table.

Referring to the accompanying drawings, forming part of this specification, and in which like reference numerals designate like parts throughout the several views thereof, 1 designates a number of I-beams upon which are secured two I-beams 2 and 3 at right angles thereto; said I-beans 1, 2 and 3 forming the base of the machine. Extending across the base at intervals are a number of angle-irons 4 the rear ends of which are secured to the I-beam 2 and the front ends project through the I-beam 3. Upon the upper surface of the angle-irons 4 are secured guide-plates 5 which serve as guides or rails for the blocks 6 and 7. The blocks 6 are provided with grooves 8 in each side into which the guide-plates 5 project, and are also provided with vertical apertures 9 through which the shafts 10 of the yokes 11 project; said shafts 10 being adapted to oscillate in the blocks 6 and are held therein by the pins 12. The said yokes 11 are each provided with a block 13 held therein by the bolt 14 and have a slot 15 extending down from the top thereof which is undercut on each side at the bottom for the reception of the guide-rails 16, which latter are made of two pieces each having its lower end bent at right angles to hold them in the slots 15. The impinging surfaces of the two pieces forming the guide-rails 16 are flat to allow them to slide against each other in the blocks 13 when the curvature or angle of said guide-rails 16 is being changed. The said guide-rails each have a flange at its lower end at one side to hold them in the blocks 13, and being formed of two pieces can be made very thin to give them greater flexibility.

The blocks 7 are forward of the I-beam 3 and are also provided with slots in each side thereof into which the guide-plates 5 project and are connected to the blocks 6 by the metal plates 17, the latter each being provided with a metal piece 18 riveted thereto at 19 and projecting upwardly at its front end and having an aperture 20 therethrough and a slot 21 extending forward from the aperture 20. The pin 22 projects through the piece 18 and the plate 17 and has its end resting in the aperture 23 of the block 7. The said pin 22 is provided with a small pin 24 at one side which passes through the slot 21 when the pin 22 is being passed through the aperture 20 and which prevents said pin 22 from coming out when placed in said aperture and turned, as shown in Fig. 6 of the drawings. The said blocks 7 are each mounted on a threaded shaft 25 the rear ends of which have their bearings in the blocks 26 back of the I-beams 3 and their front ends provided with a hand wheel 27.

The shafts 25 are each provided with a collar 28 between the plates 29 and 30 which latter are secured to the ends of the angle-irons 4. The turning of the hand-wheel 27 causes the blocks 7 and consequently the blocks 6 to move backward or forward for the purpose of adjusting the curvature or angle of the guide-rails 16. At the side of each of the blocks 7 is a line 31 on the upper surface thereof adapted to register with the gage 32 at the side of said blocks 7, said gages 32 being secured to the upper surface of the guide-plates 5 by means of the screws 33. The carriage is formed of two angle-irons 34 and 35 and a number of short transverse angle-irons 36 which rest upon and are secured to the inwardly-projecting flanges of the angle-irons 34 and 35. On the outer surfaces of the angle irons 34 and 35 are secured the rollers 37 which rest upon the rails 38 on the upper surface of the angle-irons 2 and 3. A metal strip 39 is provided at the outer surfaces of the rollers 37 and projects down over the sides of the rails 38. The said rollers 37 have their bearings in said strips 39 and the sides of the angle-irons 34 and 35, which latter also project down over the sides of the rails 38, thus preventing any sidewise movements of the carriage as it is moved along the rails. On the lower surface of the angle-iron 34 is secured a rack 40 in mesh with the gear-wheel 41 on the inner end of the shaft 42, the latter being mounted in the bearings 43 and 44 and is provided with a large hand wheel 45 on its outer end. By turning the said wheel 45 the carriage, through the medium of the gear-wheel 41 and rack 40, will be moved along the rails 38 to the right or left, as desired. Secured to the plate 39 at the front of the machine is a notched spacing bar 46 which travels with the carriage and coöperates with the dog 47 for spacing the rivet holes in the plate being punched. The said dog 47 operates vertically in the slot 48 in the upper end of the casting 49 bolted to the front of the I-beam 3 and prevents any lateral movement of said dog 47 and also holds it in perfect alinement. The said dog 47 is carried on the upper end of the rod 50 and is held normally out of engagement with the notches of the spacing bar 46 by the coiled spring 51. The lower end of the rod 50 is pivoted to the short lever 52 which latter is secured to the inner end of the shaft 53 mounted in the bearings 54 and 55 on the side of the I-beam 56 and provided with a treadle 57 on its outer end. When the foot of the operator is upon the treadle 57 the dog 47 will rest upon the upper edge of the spacing bar 46 and when the wheel 45 is turned the carriage, and consequently the spacing bar 46, will be moved along the rails until the next notch of the spacing bar 46 comes under the dog 47 when the pressure on the treadle 57 by the operator will cause the said dog 47 to fall into the notch and lock the carriage, at the same time causing the treadle 57 to strike the button 58 which closes the circuit and operates the punch 59. The treadle 57 is then released and the carriage advanced to the next notch by turning the wheel 45, when the same operation is repeated and continued until all the holes have been punched in the plate 60. When it is desired to change the spacing of the holes in the plate being punched, the spacing bar 46 is removed and another spacing bar inserted having notches the spacing of which corresponds to the spacing of the holes to be punched in the plate. The plate-table is composed of two channel-irons 61 connected by a number of short transverse channel-irons 62 which project above the channel-irons 61 and upon which the plate 60 rests, and a bottom plate 63 which extends the entire length of the said plate-table. The under side of the said plate-table is provided at intervals with transverse rails 64 directly above and in line with the rails 65 on the flanges of the angle-irons 36. The said rails at the end of the plate-table are closer together. Between the rails 64 and 65 are rollers 66 which have their bearings in the plates 67. These plates 67 travel back and forth with the rollers 66 and project beyond the rails 64 and 65 at the top and bottom and hold the said rollers thereon. The plate-table thus resting on the rollers 66 is adapted to be moved back and forth at right angles to the travel of the carriage in order that the plate may be punched on a curve or angle opposite to that described by the guide-rails 16. At each end of the plate-table are two Z-bars 68 the upper angles of which are provided with a number of apertures 69, and a short plate 70 which also has apertures in each end for the reception of the bolts 71 and is adapted to be adjusted along the Z-bars 68 to accommodate the varying widths of plates to be punched. The plate 60 to be punched rests upon the upper surface of the channel-bars 62 and is held by the screw-clamps 72 at each end which said clamps are each provided with a pin 73 adapted to fit into one of the apertures 74 in the plate 70. The said apertures 74 may be in line, or staggered, so that two lines of holes can be punched in line or staggered in the plate 60 by changing the pin 73 of the clamps 72 from one to the other of the holes 74 after one line of holes has been punched in the plate 60. Secured to the under surface of the plate-table at each end thereof is a bearing 75 having a central aperture 76 into which a shaft 77 projects, said shaft 77 being provided with a cross-head 78 on its lower end which rests upon the upper edge of the guide-rails 16. Two rollers 79 are revolubly secured to the lower surface of the cross-

head 78 and have their peripheries impinging against the opposite sides of the guide-rails 16 whereby the said plate-table and consequently the plate being carried thereby, will be caused to follow the curvature or angle of the guide-rails 16. There are two guide-rails 16 and they are both set at the same curvature or angle and one end of the plate-table is connected, as above described, to one guide-rail 16 and the opposite end to the other guide-rail 16, both of which guide-rails can be set to any curve or angle desired by turning the hand wheel 27 which operates the blocks 7 and 6 upon which latter the guide-rails 16 are carried. The line of holes punched in the plate 60 as it is fed to the die will have a curvature or angle of the same degree but opposite to that described by said guide rails 16. The guide-rails 16 are each formed of two pieces so that they may readily yield when being adjusted the flat impinging surfaces of said two pieces being adapted to slide against each other during the adjustment of said guide-rails 16

The operation of the device is as follows: The guide-rails 16 having been set to the proper curvature or angle, through the mechanism heretofore described, the plate 60 to be punched is secured in position on the plate-table. The operator then turns the wheel 45 causing the carriage to move toward the other end of the base carrying the plate-table and plate with it and as the next notch of the spacing bar 46 comes under the dog 47 the treadle 57 is pressed down locking the said carriage and at the same time causing the treadle to strike the button 58 closing the circuit which causes the die to punch the plate 50. The treadle 57 is then released and the carriage moved forward another notch when the same operation is repeated and continued until one line of holes has been punched in the plate 60. At the same time the carriage is moving along the rails on the base the plate-table is caused to follow the curvature or angle of the guide-rails 16 through the mechanism described, thereby causing the punching of the plate 60 to be done at the same degree of curvature or angle but opposite to that of the guide-rails 16.

When the guide-rails 16 have been set for the punching of any particular or standard pattern or design, or for a certain size ship, a record of the same may be kept in accordance with the gages 32 so that the same design or pattern may be reproduced at any time.

Having thus described my invention, what I claim is:

1. A steel-plate rivet-hole spacing table comprising a carriage, stationary rails upon which said carriage travels, guide rails between said stationary rails and each composed of two pieces the impinging faces of which are adapted to slide against each other, means for changing the curvature of said guide rails, and a plate table mounted on said carriage and having connection with the guide rails, whereby when the carriage is traveling the plate table will follow the curvature of said guide rails.

2. A steel-plate rivet-hole spacing table comprising a carriage, stationary rails upon which said carriage travels, guide rails between said stationary rails each composed of two pieces the impinging surfaces of which are adapted to slide against each other and each provided with a flange at its lower end and at one side, means to change the curvature of said guide rails, and a plate table mounted on said carriage and having connection with the guide rails, whereby when the carriage is traveling the plate table will follow the curvature of the guide rails.

3. A steel-plate rivet-hole spacing table comprising a base, a carriage mounted upon said base and adapted to travel thereon, curved guide-rails mounted on said base, means for changing the curvature of said guide-rails, a plate-table mounted on said carriage and adapted to move back and forth at right angles to the travel of the carriage, and two wheels revolubly mounted at each end of the plate-table and having their peripheries impinging against the opposite sides of the guide-rails, whereby when the carriage is moved the plate-table will follow the curvature of the guide-rails.

4. A steel-plate rivet-hole spacing table comprising a base, a carriage mounted upon said base and adapted to travel thereon, blocks slidably mounted on said base, guide-rails carried by said blocks, means for moving said blocks back and forth on said base to change the curvature of the said guide-rails, a plate-table mounted on said carriage and adapted to move thereon at right angles to the travel of the said carriage, and means connecting the plate-table with the guide-rails, whereby when the carriage is moved along the base the plate-table will follow the curvature of the guide-rails.

5. A steel-plate rivet-hole spacing table comprising a base, a carriage mounted on said base, a plate-table mounted on said carriage and adapted to move thereon at right angles to the travel of the said carriage, curved guide-rails, means for changing the curvature of said guide-rails, means connecting the plate-table with the said guide-rails whereby when the carriage is moved the plate-table will follow the curvature of the said guide-rails, two bars at each end of said plate-table each having apertures therein, a short plate resting upon said bars and having apertures in each end adapted to register with the apertures in said bars and two apertures at or near the

center thereof, a plate-clamp at each end of the table and having a pin adapted to fit into the apertures at the center of the said short plate.

6. A steel-plate rivet-hole spacing table comprising a carriage, guide rails each composed of two pieces the impinging faces of which are adapted to slide against each other, means for changing the curvature of said guide rails, and a plate-table mounted on said carriage and having connection with the guide rails, whereby when the carriage is traveling the plate-table will follow the curvature of said guide-rails.

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

LEO F. COLL.

Witnesses:
C. MILTON DICKERSON,
CHAPIN A. FERGUSON.