R. L. FRINK.

GLASS CUTTING DEVICE.

APPLICATION FILED APR. 18, 1907.

921,652.

Patented May 11, 1909.

2 SHEETS—SHEET 1.

Fig. 1

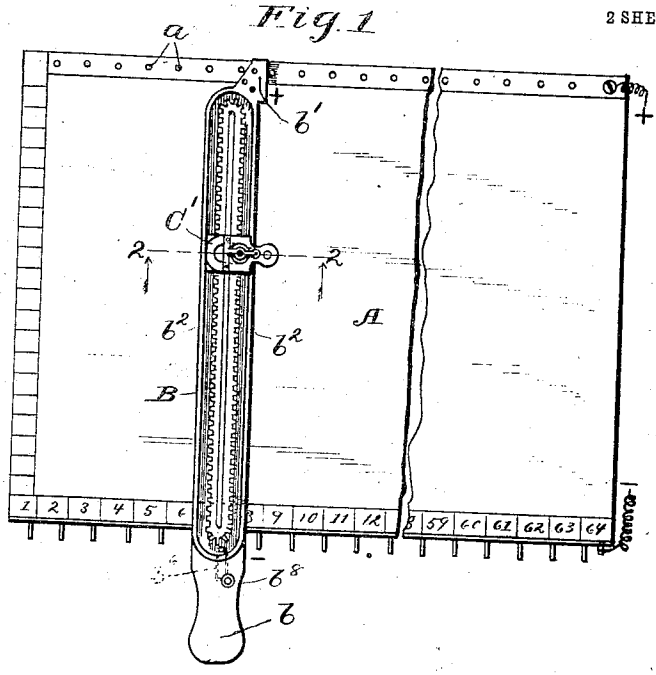
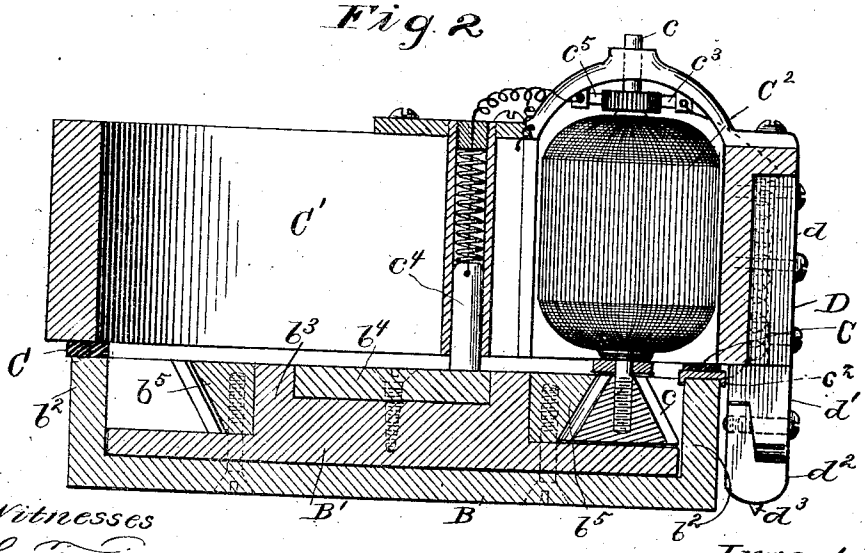


Fig. 2



Witnesses

J. C. Turner

Jno. F. Oberlin

Inventor.

Robert L. Frink

by J. B. Fay

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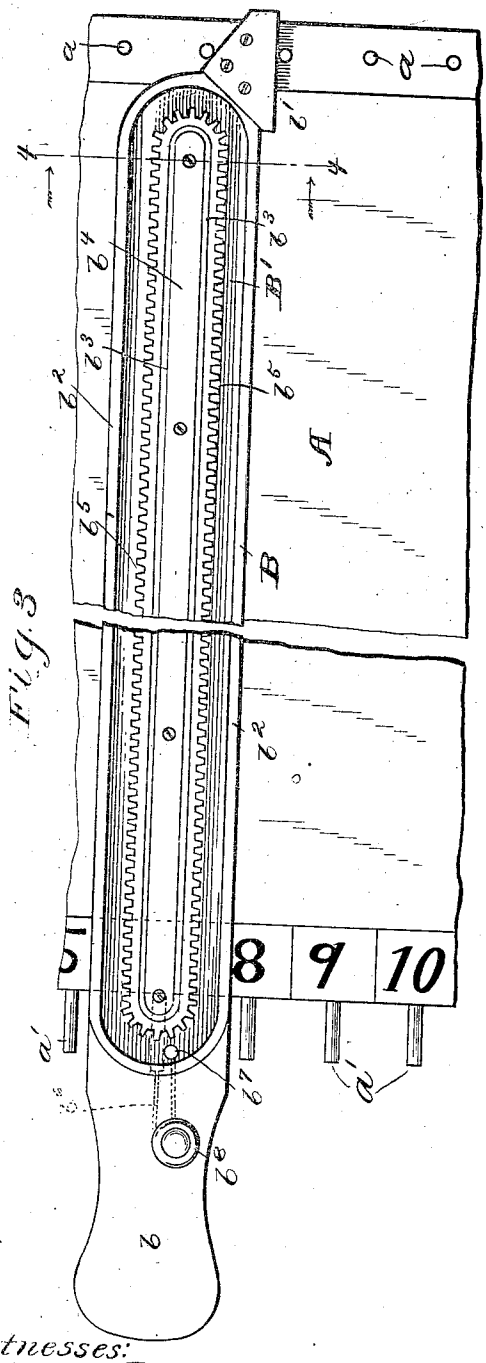


Fig. 3.

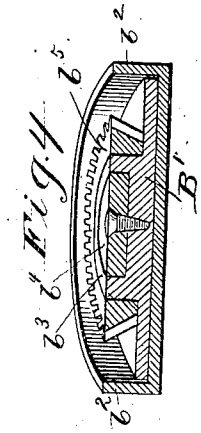


Fig. 4.

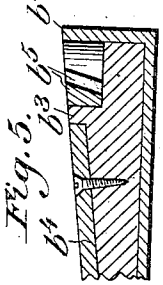


Fig. 5.

Witnesses:

J. C. Turner

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UNITED STATES PATENT OFFICE.

ROBERT L. FRINK, OF CLEVELAND, OHIO.

GLASS-CUTTING DEVICE.

No. 921,652. Specification of Letters Patent. Patented May 11, 1909.

Application filed April 18, 1907. Serial No. 368,844.

To all whom it may concern:

Be it known that I, ROBERT L. FRINK, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Glass-Cutting Devices, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates, as indicated, to glass cutting devices, that is to devices for cutting or squaring sheet glass as in the manufacture of window and plate glass.

Said invention has as its object the provision of means whereby the sheets may be much more rapidly cut while at the same time measurably decreasing the loss attendant to breakage and insuring the cutting of the sheets absolutely square or at least as square as the accuracy of the table and straight edge in use will permit.

To the accomplishment of these and related ends, said invention consists of means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain means embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a plan view of the glass table or board, such as is employed in this connection, together with a straight edge for use thereon, said straight edge embodying the improved construction constituting my invention; Fig. 2 is a vertical transverse cross-section of said straight edge and appurtenant parts taken on the line 2—2, Fig. 1; Fig. 3 is a plan view on an enlarged scale of the straight edge by itself with such appurtenant parts removed therefrom; Fig. 4 is a transverse cross-section of said straight edge taken on the line 4—4 of Fig. 3; and Fig. 5 is a fragmental section at right angles to that of Fig. 4.

It is well known from the difficulties that are attendant upon the methods at present in vogue in glass factories for cutting the sheets of glass as they come from the flattening and annealing chambers, that such methods are lamentably deficient in certain particulars. In the first place the art of the glass cutter is one quite difficult to acquire since the knack of using the glazier's diamond properly and judging of the proper vertical angle at which it should be held requires considerable practice. And even in the practiced hand there is always the liability present of a slip or mis-cut that will ruin an entire sheet of glass or at least cause a material depreciation thereof in value. This liability is present not merely in the handling of the tool but in the holding of the straight edge which is utilized to guide said tool, not an infrequent cause of trouble with employees in the cutting department arising from controversy as to whether a sheet that fails to true up has been wasted owing to the employee's carelessness or because of an inaccurately built table and straight edge.

In the glass cutting device here presented I utilize a board or table A that in all essential particulars is the same as that commonly employed. Such table is ordinarily composed of well seasoned lumber, being made up of narrow strips so as to always remain true, and is ruled from side to side both ways, dividing the board into even inches or where desired into fractions of inches. At the top of the board is provided a series of perpendicular pins *a* one for each inch and at the bottom a corresponding series of horizontally projecting pins *a'*. For use upon such table or glass board there is provided a straight edge B to the details of construction of which particular attention is invited. In its general features, however, such straight edge B, alike with the table, resembles those heretofore employed in this connection. Thus its length is such as to adapt it to lie transversely of the board; it is provided at one end with a handle *b* permitting it to be readily grasped by the operator; and at the opposite end it bears a wedge shaped point *b'* preferably of metal that is designed to be inserted, between adjacent pairs of the series of perpendicular pins *a*. The other or handled end is provided with a depending lug not shown that is designed when such wedge-shape point is thus inserted to engage the corresponding horizontal pin *a'* on the lower side of the table. By engagement of the respective ends of the straight edge with such pins after the fashion described the proper alinement thereof is assured, that is so long as the operator retains the rule firmly in position on the pins. Obviously however, the slightest release of his grip on the handle,

while he is drawing the diamond along the edge of the rule, would be disastrous to the sheet being cut, and this is one of the difficulties which I am seeking to overcome.

In my improved rule I form the base thereof, of metal, preferably of aluminum for the sake of lightness. Such base is provided with a continuous upwardly turned flange b^2 along both edges and across its ends. Mounted on the upper side of the rule within such flange b^2 is a wooden strip B' Figs. 2 and 4, formed with a central raised portion b^3 that terminates short of the ends of the base B, or rule proper. Inset in such raised portion b^3 so as to lie flush with the surface of the same is a strip b^4 of copper or like conducting material, and secured to the outer edge of such raised portion is an endless rack b^5. The latter is preferably of the outwardly inclined or beveled form shown, Figs. 2 and 4. Slidably resting upon the aluminum base of the rule but insulated therefrom by a strip or shoe C of fiber or other suitable material is a permanent magnet C' between the poles of which is rotatably mounted an armature C^2 thus constituting the structure a small motor of the magnet type. Upon the lower end of the shaft c of such motor is mounted a bevel pinion c' that engages the rack b^5 above described as extending entirely about the central portion b^3 of the rule. A contact member c^2 mounted in the end of fiber strip C adjacent to the armature C^2 is designed to form electrical connection between one armature brush c^3 and the aluminum base of the rule. A second spring-pressed contact member C^4 suitably mounted on the opposite side of the armature is adapted to afford similar connection between the other armature brush c^5 and the conductor strip b^4. Securely attached to the frame structure provided by magnet C' and the motor bearings supported thereby, is the glass cutting tool, proper, D. This consists simply of a base member d vertically secured to such frame so as to overhang the edge of the rule. In the lower end of this member, pivoted about a vertical axis, is a second member d' to which in turn is pivoted on a transverse axis a member d^2. In the latter is mounted the diamond d^3. From this construction it will be seen that the cutting point of the diamond can be disposed so as to most effectively perform its function and at the same time the distance between such point and the edge of the rule can be regulated to cut a sheet of exactly the proper or desired width.

The motor C^2 is connected with a suitable source of electrical energy such as a battery through the connections in the rule partly described above and other suitable connections in the table now to be set forth. Thus electrical connection between the base of the rule, which is connected with one armature brush through contact member c^2, and one pole of the battery is had through wedge member d' and pins a which, inserted as they are in the insulating wooden top of the table, are nevertheless suitably connected together to form one lead or conductor from the battery. Strip b^4, which it will be remembered is connected with the opposite brush of the motor armature, is designed to be connected with the other pole of the battery through a conductor b^6 in the handle end of the rule that terminates in a contact member b^7 adapted to engage pins a', when the straight edge or rule is held properly in position upon the board but at no other time. Such pins a' are connected with the other pole of the battery in the same fashion as are pins a. Interposed in conductor b^6 is a circuit making and breaking device b^8, such as a push button of the ordinary type whereby independent control of the electrical connections for the motor is to be had. If desired, instead of employing a simple make and break device a reversing switch may be introduced and corresponding reversible operation of the motor thus had.

From the preceding description of the operative parts of my improved glass cutting device it will be seen that the upwardly turned flange b^2 of the straight edge base B forms in effect a track on which the supporting frame or magnet of the motor rests and along which it is adapted to glide as rack-engaging pinion c' is rotated. Thus the glass cutting tool D is drawn along the edge of the rule and parallel therewith. In order that this tool may be transferred from one side to the other of the rule as the motor frame swings around the respective ends of the rule upon completion of the straight away movement just described, the ends, or transversely disposed portions of the flange b^2 are raised above the level of the laterally disposed portions thereof, see Figs. 4 and 5. It should be here added that the rack b^5, as well as the pinion c of the motor that engages therewith, are desirably made of fiber thus conducing to the smooth and noiseless operation of the motor. The first named characteristic is particularly to be sought since upon it, and the steadiness with which the motor frame is guided, depends the success and accuracy of alinement of the cut being made by the diamond. Where a reversing switch instead of a simple circuit making and breaking device is employed a to and fro movement of the cutting tool along one side of the straight edge will be substituted for the continuous movement just set forth. Obviously, however, movement in one direction only will be effective in cutting glass, in either arrangement. From the preceding description of the electrical connections for the motor it will be seen that operation of the latter is to be had only when the straight edge is properly positioned upon the board for the mak-

ing of a straight and true cut, and this irrespective of the length of the sheet being handled. Furthermore, if, after the correct position has been once thus assumed, the straight edge is withdrawn accidentally or otherwise from such position, the electrical connection between the motor and the battery will be instantly broken and the cutting cease. With this device in use, in other words, the difficulties attendant upon the old method of cutting glass largely disappear, and with such disappearance is secured greater ease and rapidity of operation. The operator is not required to stretch himself in an uncomfortable position over the cutting table but can conduct the whole operation from his station at the handle end of the straight edge. The dependence of the manufacturer upon skilled labor now existing is likewise eliminated since a boy can obviously handle the device above described just as readily and with the same degree of accuracy as a practiced glass cutter.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. The combination with a suitable support, of a guide member for use thereon, and glass cutting means mounted upon said guide member, the operation of said means being dependent upon the position of said member.

2. The combination with a suitable support, of a guide member for use thereon, and self-propelling glass cutting means mounted upon said guide member, the operation of said means being dependent upon the position of said member.

3. The combination with a suitable support, of a guide member for use thereon, and electrically operable glass cutting means mounted upon said guide member, the operation of said means being dependent upon the position of said member.

4. The combination with a suitable support, of a guide member for use thereon, a glass cutting tool movably mounted upon said guide member, electrical means for actuating said tool, and connections for said actuating means, said connections being complete only when said guide member is properly alined upon said support.

5. The combination with a suitable support, of a guide member for use thereon, a glass cutting tool movably mounted upon said guide member, electrical means for actuating said tool, connections for said actuating means, said connections being complete only when said guide member is properly alined upon said support, and independent means for controlling said connections.

6. The combination of a glass table, a straight edge for use thereon, means on said table for properly alining said straight edge, a glass cutting tool movably mounted upon said straight edge, electrical means for actuating said tool, and connections for said actuating means, said connections being complete only when said straight edge is properly alined.

7. The combination of a glass table, a straight edge for use thereon, means on said table for properly alining said straight edge, a glass cutting tool movably mounted upon said straight edge, an electric motor for actuating said tool, connections for said motor, said connections being complete only when said straight edge is properly alined, and independent means for controlling said connections.

8. The combination of a suitable support, a straight edge for use thereon, a frame movable along said straight edge, a glass cutter borne by said frame, and self-propelling means for said frame adapted thus to move the same.

9. The combination of a suitable support, a straight edge for use thereon, a frame movable along said straight edge, a glass cutter borne by said frame, and an electric motor mounted in said frame and coöperative with said straight edge thus to move said frame.

10. The combination of a suitable support, a straight edge for use thereon, said straight edge bearing a rack, a frame mounted upon said straight edge and movable therealong, a glass cutter borne by said frame, and an electric motor mounted in said frame and engaging said rack thus to move said frame.

11. The combination of a glass table, a straight edge for use thereon, said straight edge bearing a rack on its upper face, means on said table for properly alining said straight edge, a frame mounted upon said straight edge and movable longitudinally therealong, a glass cutter borne by said frame, and an electric motor mounted in said frame and engaging said rack to move said frame.

12. The combination of a glass table, a straight edge for use thereon, said straight edge bearing a rack on its upper face, means on said table for properly alining said straight edge, a frame mounted upon said straight edge and movable longitudinally therealong, a glass cutter borne by said frame, an electric motor mounted in said frame and engaging said rack to move said frame along said straight edge, and electrical connections on said table and straight edge for said motor, said connections being complete only when said straight edge is properly alined.

13. The combination of a glass table, a straight edge for use thereon, said straight edge bearing a rack on its upper face, means on said table for properly alining said straight edge, a frame mounted upon said straight edge and movable longitudinally therealong, a glass cutter borne by said frame, an electric motor mounted in said frame and engaging said rack to move said frame along said straight edge, electrical connections on said table and straight edge for said motor, said connections being complete only when said straight edge is properly alined, and means borne by the latter for independently controlling said connections.

14. The combination of a glass table, a straight edge for use thereon, said straight edge bearing an endless rack on its upper face, means on said table adapted to engage said straight edge to properly aline the same, a frame comprising a permanent magnet mounted upon said straight edge and movable longitudinally therealong, a glass cutter borne by said frame, a motor armature rotatably mounted in said frame and provided with a pinion engaging said rack, electrical connections in said table and straight edge for said motor armature, said connections being complete only when said straight edge is properly alined, and means borne by the latter for independently controlling said connections.

15. The combination of a glass table, a straight edge for use thereon, a member mounted upon said straight edge so as to be movable therealong, and a glass cutting tool borne by said member, said tool being pivotal about a substantially vertical axis and about an axis angular thereto.

16. The combination of a glass table, a straight edge for use thereon, a member mounted upon said straight edge so as to be movable therealong, and a glass cutting tool borne by said member, said tool being rotatable about a substantially vertical axis and being angularly adjustable with respect to such axis.

17. The combination of a glass table, a straight edge for use thereon, said straight edge bearing a rack on its upper face, means on said table for properly alining said straight edge, a frame mounted upon said straight edge and movable longitudinally therealong, a glass cutter borne by said frame, and driving means borne by said frame and engaging said rack to thus move said frame.

18. A glass-cutting device, comprising a straight edge, a member movable therealong, a glass cutter borne by said member, and self-propelling means for said member adapted thus to move the same.

19. A glass-cutting device, comprising a straight edge, a member movable therealong, a glass cutter borne by said member, and an electric motor mounted on said member and coöperative with such straight edge thus to move said member.

20. A glass-cutting device, comprising a straight edge bearing a rack, a member mounted upon such straight edge and movable therealong, a glass cutter borne by said member, and an electric motor mounted on said member and engaging said rack thus to move said member.

Signed by me this 4th day of April 1907.

ROBERT L. FRINK.

Attested by—

D. T. DAVIES,

JNO. F. OBERLIN.