

Oct. 7, 1930.

H. F. HITNER

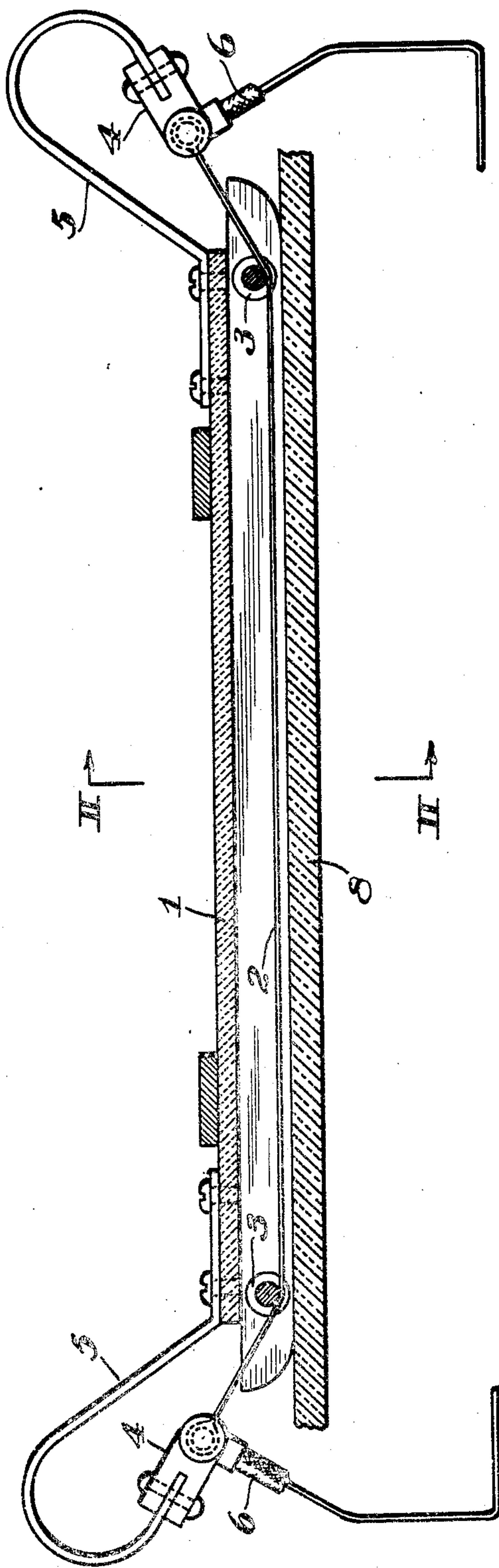
1,777,644

APPARATUS FOR SEVERING GLASS SHEETS

Filed Dec. 22, 1928

2 Sheets-Sheet 1

Fig. 1.



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2 Sheets-Sheet 2

Fig. 2.

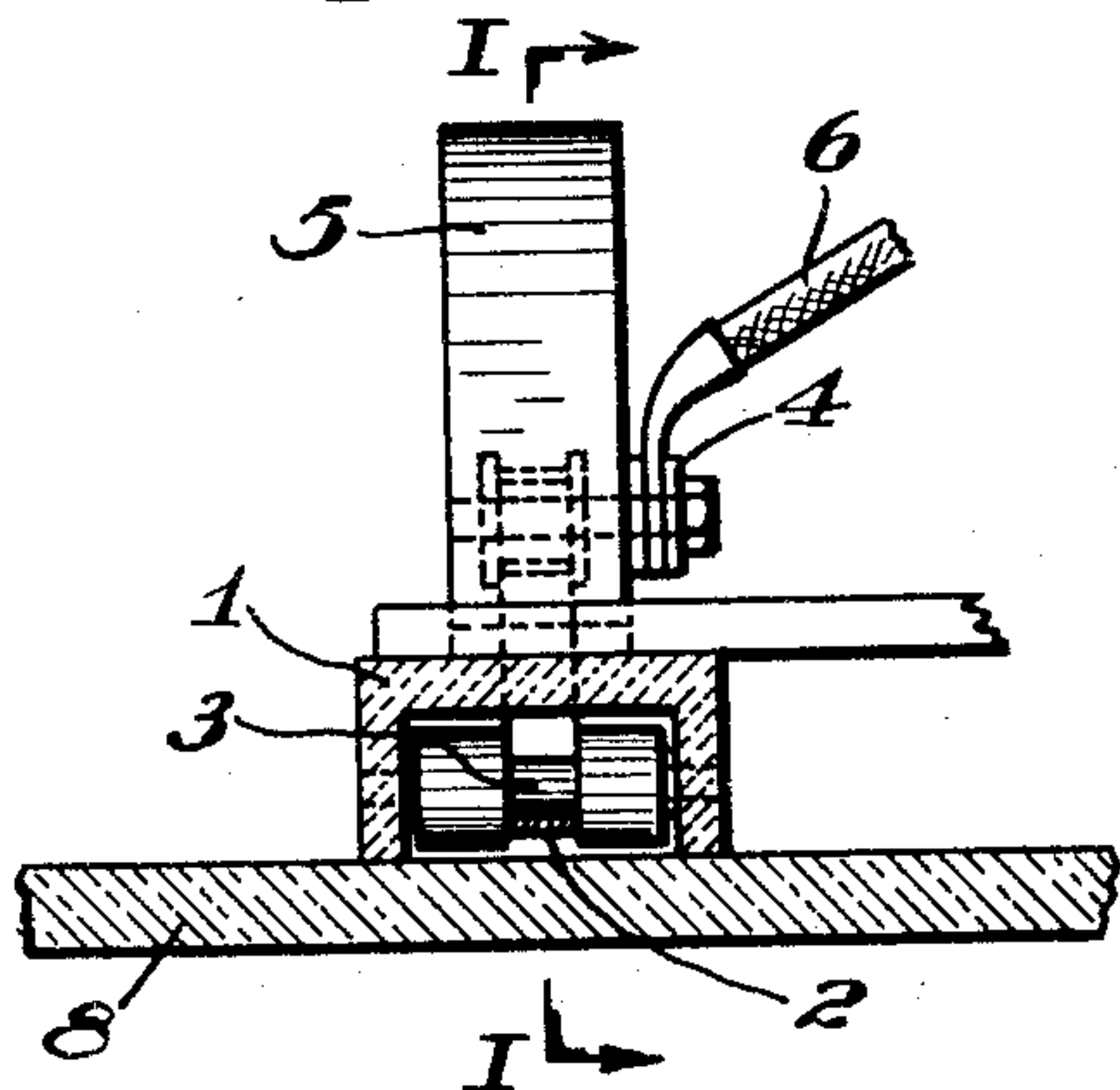


Fig. 3.

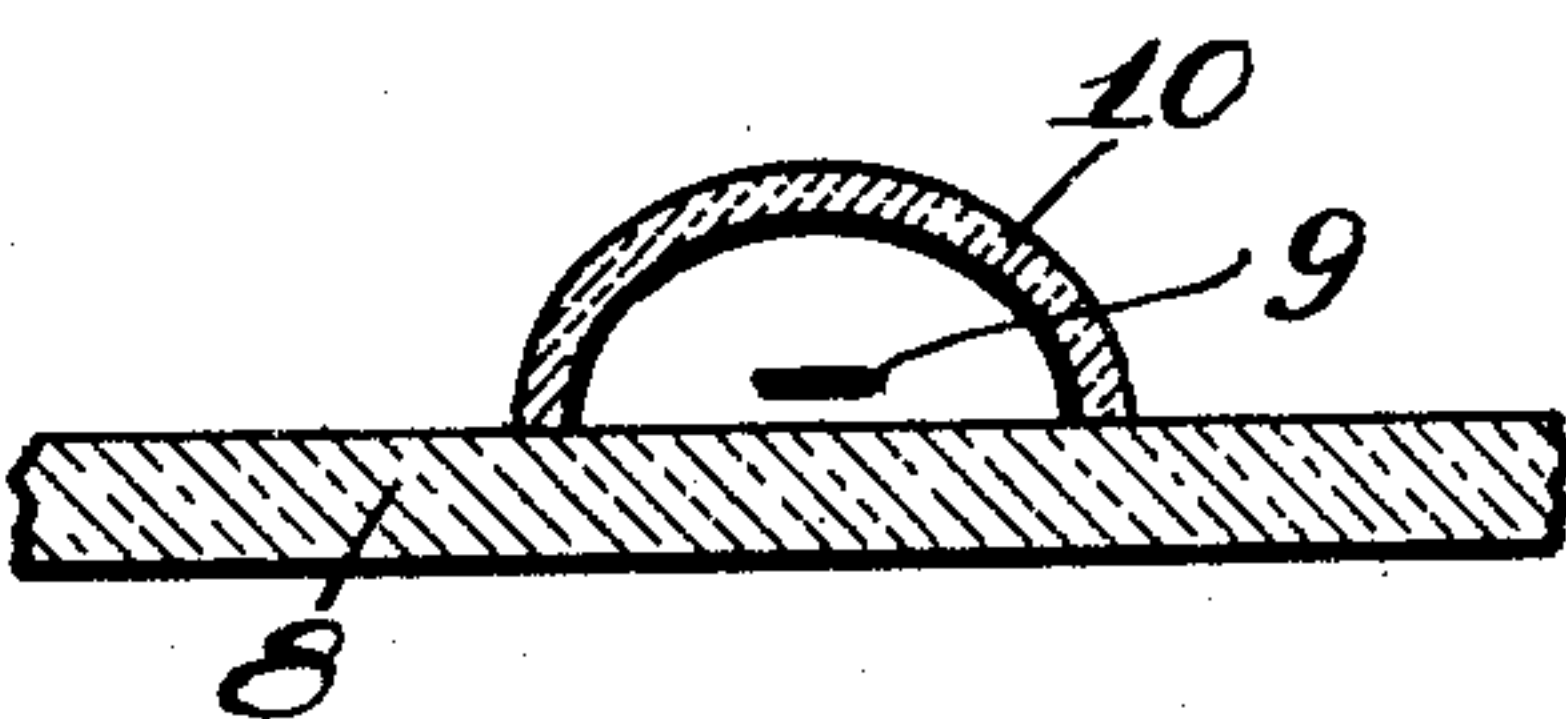


Fig. 4.

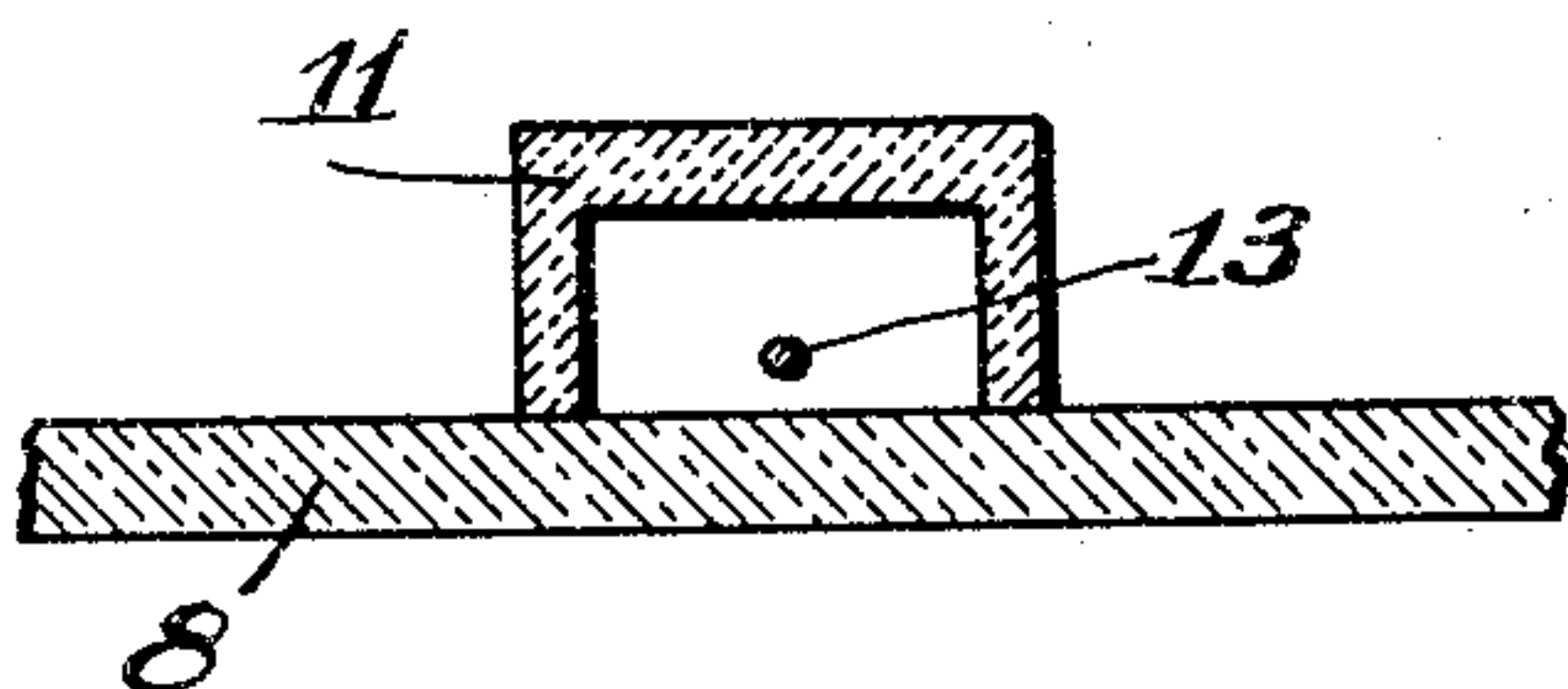


Fig. 5.

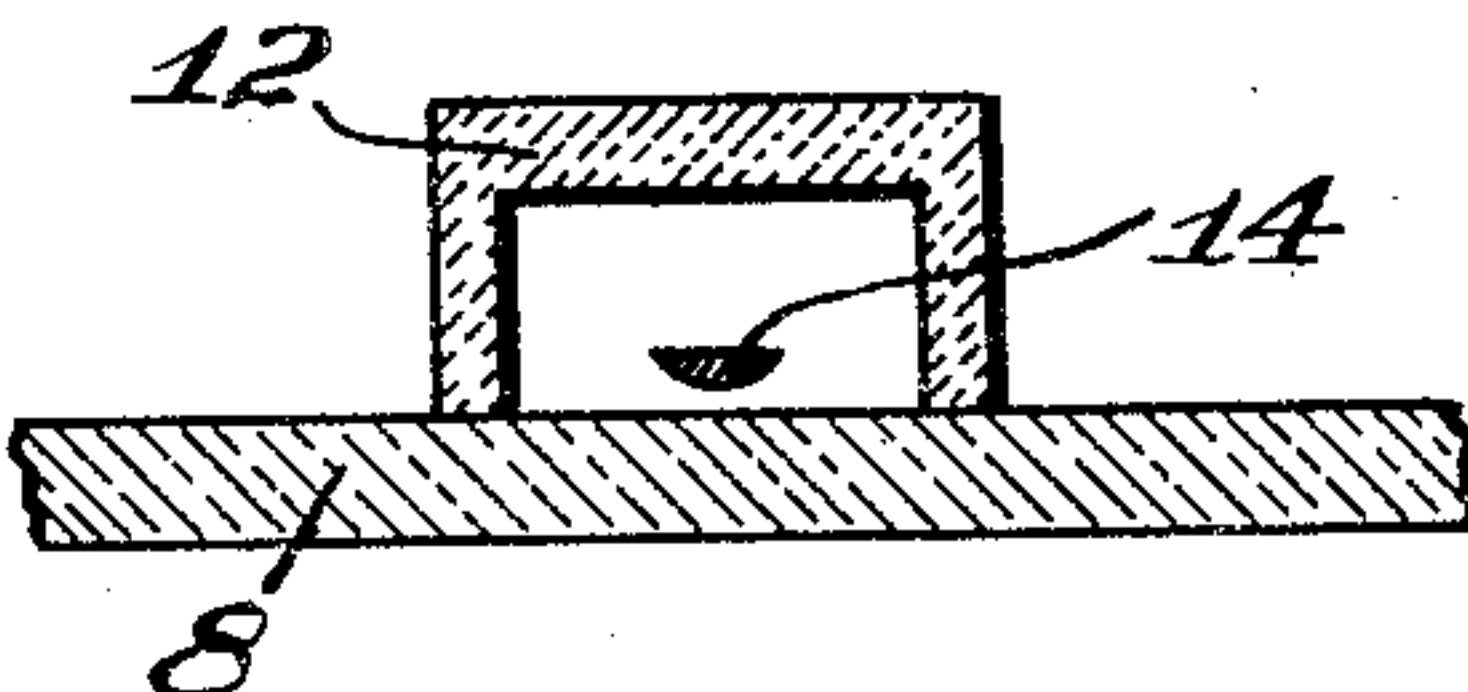


Fig. 6.

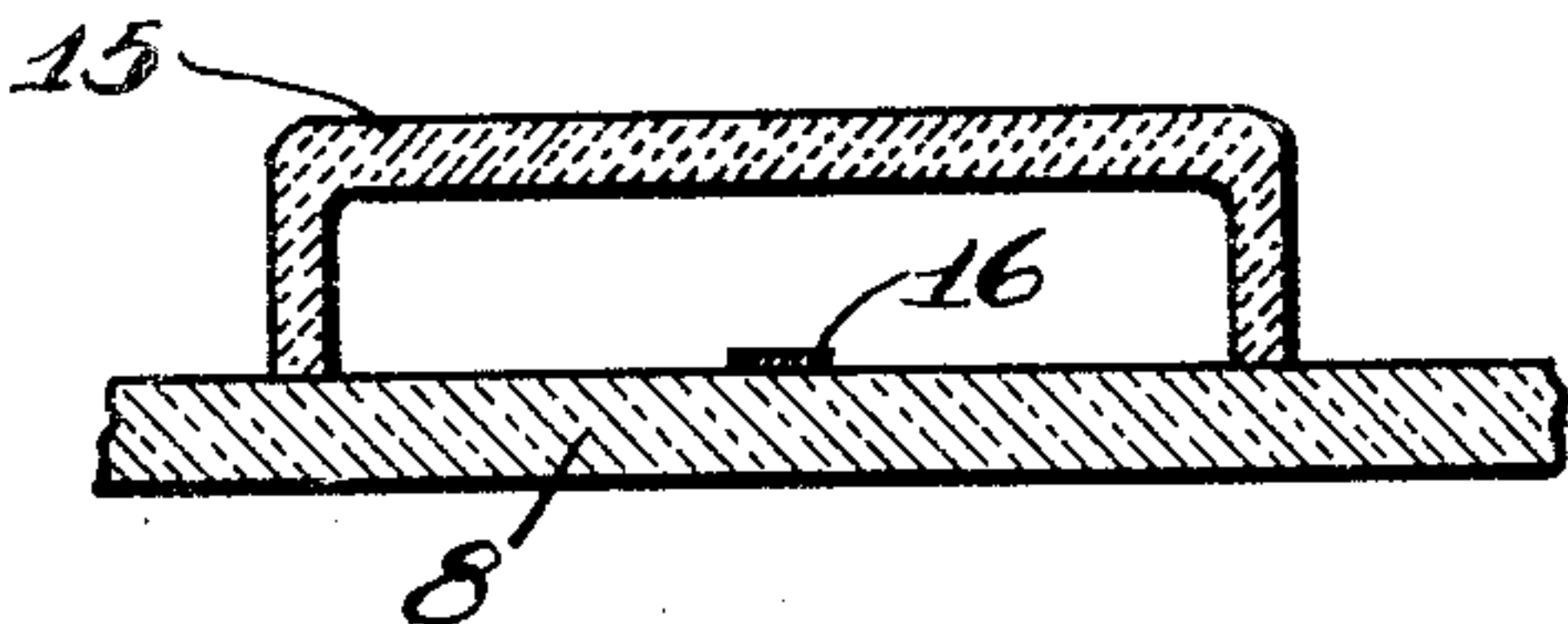
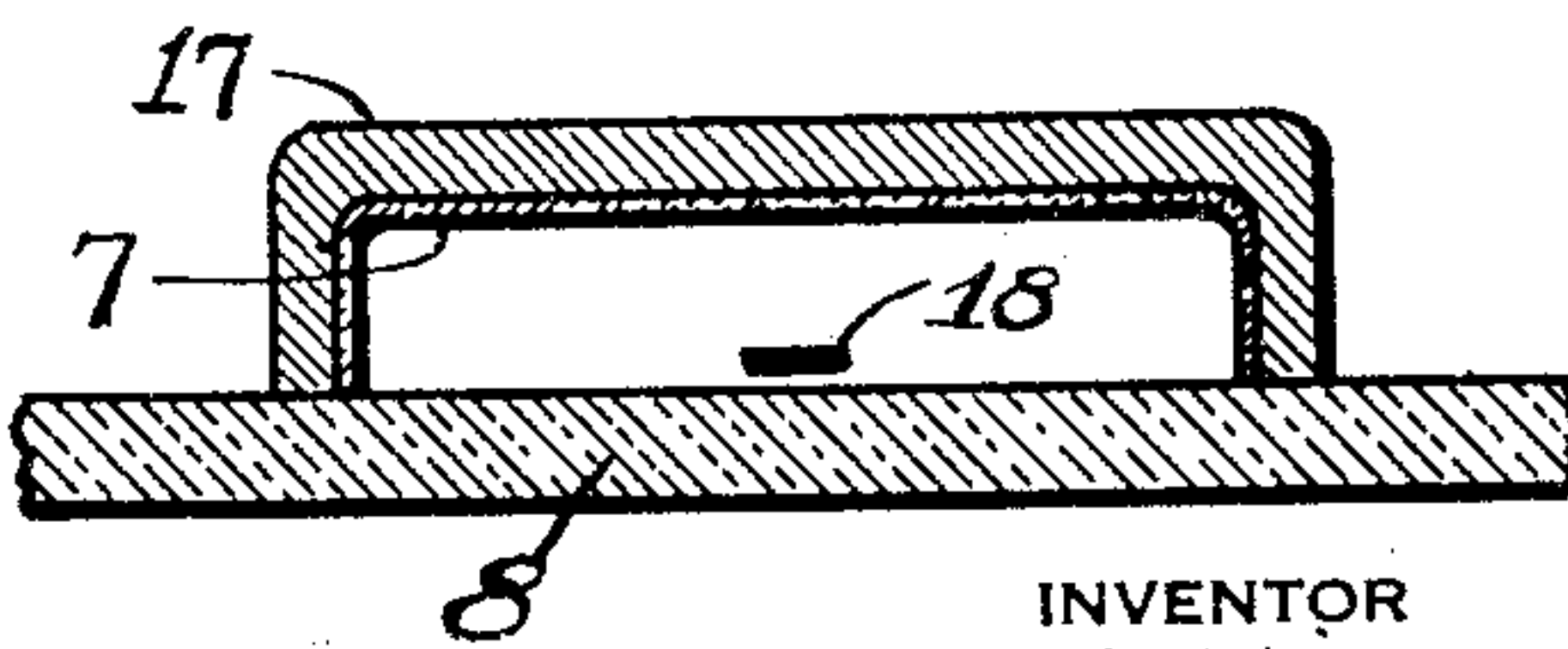


Fig. 7.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR SEVERING GLASS SHEETS

Application filed December 22, 1928. Serial No. 327,996.

The invention relates to apparatus for severing glass sheets by the use of electricity. It has for its objects, the provision of an improved apparatus adapted to prevent the somewhat irregular line of fracture which has heretofore been characteristic of the severing of glass by the use of an electrically heated wire or ribbon. This irregularity of fracture appears to be due to a too greatly localized line of heating corresponding to the line of contact of the heating element with the glass. I avoid this condition by providing means for giving a distribution of heat over a substantial area of glass on each side of the ribbon or wire, and as a result, the line of fracture is smooth and regular, approximating in these particulars, the line of fracture secured by scoring the glass with a diamond or wheel. Certain embodiments of the invention are illustrated in the accompanying drawings, wherein:

Figure 1 is a longitudinal section on the line I—I of Fig. 2. Fig. 2 is a section on the line II—II of Fig. 1. And Figs. 2 to 7 are transverse sections through different forms of insulating channel bars.

Referring to the drawings, 1 is a channel bar carrying the resistance wire 2, such wire being in the form of a ribbon extending over the rollers 3, 3 and secured at its ends to the terminal blocks 4, 4. The blocks are carried by spring arms 5, 5, secured to the bar 1 by means of screws and serving to hold the wire under tension as it expands and contracts while being heated and while cooling down. The leads 6, 6 serve to supply the electric current for heating the wire. The bar 1 is preferably of asbestos composition and provides both electrical insulation and heat insulation. If desired the bar may be made of metal and provided with an asbestos lining 7, as indicated in Fig. 7, in which case the bar still provides the necessary electrical and heat insulation and has an added degree of strength not present in the bar 1.

The rollers 3, 3 are preferably located so that when the wire 2 is under tension it lies to the rear of the side edges of the channel bar, as indicated in Fig. 2, so that the wire is out of contact with the glass sheet 8 when

the bar is placed in contact with such sheet. The channel is of such width that its side walls are spaced away from the edges of the wire a substantial distance, such distance being preferably several times the width of the wire.

In operation, the device is positioned as indicated in Figs. 1 and 2 and current is supplied through the wire bringing it to a red heat. In a few seconds the glass is heated sufficiently to permit of the cracking off operation which is accomplished by applying a cool or wetted tool to the line of heating or by suddenly chilling in some other suitable manner as by the application of air or water vapor. This causes the glass to crack in a straight true line opposite the longitudinal center line of the wire. I have found that the use of a channel several times the width of the wire contributes to the securing of a straight true line of fracture, the result in these particulars being much better than in the case where a bar is used whose channel is only wide enough to receive the wire. The result is also improved by keeping the wire out of contact with the glass, although this is not an essential, as good results may be obtained when the wire actually contacts with the glass, as indicated in Fig. 6.

Figs. 3 to 7 indicate modifications. In Fig. 3 the wire 9 is carried in a channel bar 10 having a curved cross section. In Figs. 4 and 5, the wires 11 and 12 in the bars 13 and 14 are respectively circular and semi-circular in cross section. In Fig. 6, the bar 15 is increased in width, and the wire 16 contacts with the glass. In Fig. 7, the bar 17 carrying the ribbon wire 18 is of metal and is provided with a lining 7 of asbestos, or other insulating material. If desired, the devices may be used in pairs on opposite sides of the glass sheet to be severed with the wires exactly opposite and in parallel. This expedient may be employed to advantage with very thick glass, or when it is desired to speed up the severing operation. It is also possible to secure the cracking of the glass without the application of cooling means, by merely keeping the device in position in the glass for a longer period, although the pre-

ferred operation includes the application of cooling means, as a step in the operation, as heretofore described.

What I claim is:

5 1. In combination in apparatus for severing glass sheets by electricity, a supporting bar of insulating material having a channel in one side, and a resistance wire mounted in said channel extending longitudinally thereof, said wire having its side edges
10 spaced away a substantial distance from the side walls of the channel.

2. In combination in apparatus for severing glass sheets by electricity, a supporting
15 bar of insulating material having a channel in one side, and a resistance wire mounted in said channel extending longitudinally thereof, said channel having a width several times the width of the wire, so that the side edges
20 of the wire are spaced away from the side walls of the channel.

3. In combination in apparatus for severing glass sheets by electricity, a supporting bar of insulating material having a channel
25 in one side, and a resistance wire mounted in said channel extending longitudinally thereof, said wire being out of contact with the walls of said channel.

4. In combination in apparatus for severing glass sheets by electricity, a supporting
30 bar of insulating material having a channel in one side, and a resistance wire mounted in said channel extending longitudinally thereof, said wire lying to the rear of the forward edges of said channel and being
35 spaced away from the side and back walls of the channel.

5. In combination in apparatus for severing glass sheets by electricity, a supporting
40 bar of insulating material having a channel in one side, and a roller mounted in said channel at each end thereof, a resistance wire mounted in said channel and extending over said rollers, and spring means carried by
45 the supporting bar and engaging the wire for maintaining it under tension, said wire being spaced away from the back wall of the channel.

6. In combination in apparatus for severing glass sheets by electricity, a supporting
50 bar of insulating material having a channel in one side, a roller mounted in said channel at each end thereof, a resistance wire mounted in said channel and extending over said rollers, and spring means carried by the supporting bar and engaging the wire for maintaining it under tension, said wire being
55 spaced away from the back and side walls of the channel.

60 In testimony whereof, I have hereunto subscribed my name this 4th day of Dec., 1928.

HARRY F. HITNER.