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W. F. BROWN

1,759,220

LEER ROLL

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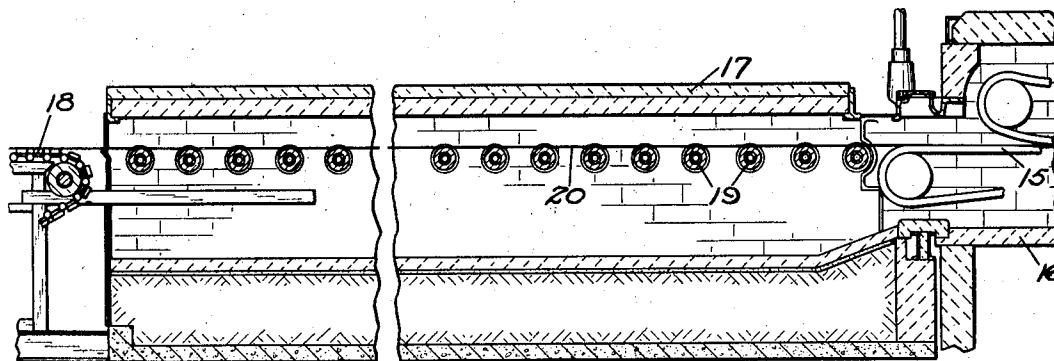


Fig. 1.

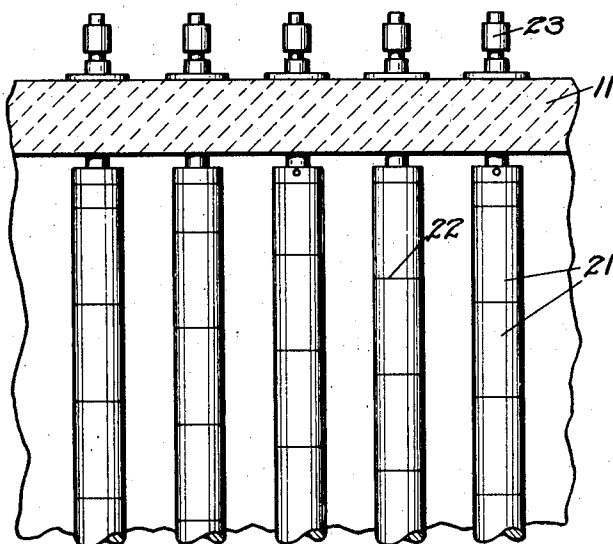


Fig. 2.

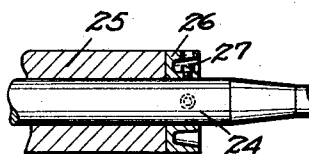


Fig. 3.

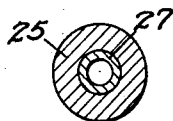


Fig. 4.

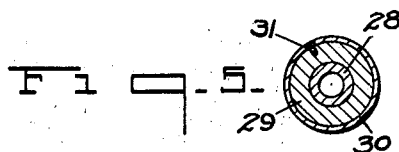


Fig. 5.

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LEER ROLL

Application filed October 1, 1925. Serial No. 59,758.

The present invention relates to sheet glass apparatus, and has particular reference to an improved type of annealing leer and especially the rolls used therein.

5 An important object of the invention is to provide an annealing leer roll formed from a material which will not injure a sheet of heated glass even if there is relative movement between the glass and the roll.

10 Another object of the invention is to provide an annealing leer comprising a plurality of rolls formed from a non-corrosive heat-resisting alloy which will not injure the glass being annealed in any manner.

15 Still another object is to provide a leer roll of this nature formed from a non-corrosive metal which is preferably made of one of the softer non-corrosive metals or alloys, thus permitting relative movement between
20 the glass and the roll without injury to the surface of the glass.

Other objects and advantages of the invention will become apparent during the course of the following description.

25 In the drawings wherein like numerals are employed to designate like parts throughout the same,

30 Fig. 1 is a fragmentary vertical longitudinal section through one type of glass apparatus,

Fig. 2 is a fragmentary top plan view showing one form of leer rolls which may be used,

35 Fig. 3 is a longitudinal cross-section through a roll,

Fig. 4 is a transverse cross-section thereof,

Fig. 5 is a sectional view of still another form.

40 Sheet glass is produced in a number of ways, such as by drawing a cylinder, splitting the cylinder and flattening the same into sheet form, continuously drawing a sheet from a pool of molten glass and deflecting it over a bending roll and passing it through
45 a horizontal annealing leer, and drawing a sheet through a slotted member known as a deputer, and passing the sheet through a vertical annealing leer, and many other methods. One type of machine is disclosed
50 in the drawings. Fig. 1 being the Colburn

machine. This machine is provided with an annealing leer through which the glass sheet being drawn passes, entering one end in a heated state and passing out of the other end in a relatively cool state.

55 The leer comprises a housing in which are mounted a plurality of rotatable rolls which support and convey the sheet through the leer. These so-called leer rolls are customarily formed from an asbestos composition
60 which is not entirely smooth and on which a high polish cannot be formed. The glass entering the leer is comparatively soft and susceptible to surface injury if it contacts with anything but a smooth surface. It is
65 almost impossible to regulate the speed of rotation of the leer rolls to give a peripheral speed the same as the speed of the sheet moving over the rolls as the sheet does not move at the same speed throughout its entire length
70 due to expansions and contractions in the sheet during the various stages of annealing. Because of this difference in the relative speeds of the roll and the sheet, relative movement occurs between the two which frequently causes the asbestos roll to scratch the
75 soft sheet.

To overcome the difficulties and objections offered by the asbestos leer rolls, I provide a roll adapted for use in the sheet glass annealing leer which will permit relative movement between the sheet and the roll without any damage. It will be understood that by relative movement I mean only the small
80 slippage between glass sheet and leer rolls which occurs because it is mechanically impractical to equalize perfectly the peripheral speed of all leer rolls with the speed of glass sheet. To produce a roll having a highly
85 polished surface it is desirable to use a metal roll. I have found that a nickel surfaced roll will function with excellent results when used as a leer roll.

Monel is another metal which is good for this purpose and which produces a roll capable of having a highly polished surface
90 which will not corrode when subjected to the action of the heat in the annealing leer.

In addition to those metals which are relatively soft, the rolls can also be formed from
100

a non-corrosive metal somewhat harder, this group including nichrome, stellite, and other similar metals. As examples of metals which practice has shown will not work, I may name copper, which scales in service, and cast iron which scales and causes bad scratches on the glass sheet.

In the drawings, in Fig. 1, is shown an annealing leer used in conjunction with the so-called Colburn machine which is disclosed in the Colburn Patent 1,248,809, granted Dec. 4, 1917. The rear end of the machine is shown including the draw table 15 contained in the drawing chamber 16, and annealing leer 17, and the cutting end 18. Arranged in the annealing leer are a plurality of rotatable leer rolls 19, which are positively driven at a speed to convey the sheet 20 through the leer where it is annealed. As has been pointed out, the old type of leer rolls were formed from an asbestos or similar composition which frequently made characteristic "leer roll scratches" on the contacting side of the glass sheet, particularly in the hot end of the leer. Such scratches are especially noticeable and objectionable when the sheet glass is silvered.

In Fig. 2 is shown a type of construction which can be satisfactorily used, and discloses the rolls 19 comprising a plurality of sections 21 whereby the rolls can be more easily handled and more cheaply manufactured. The joints 22 between the rolls are preferably staggered as indicated to prevent the formation of lines or other surface defects in the sheet passing over the rolls. The leer rolls externally of the leer 17 carry suitable gears 23 which may be associated with any source of power to rotate the said rolls. The rolls may be formed from the relatively soft metal in many ways, and as shown in Figs. 3 and 4 comprise a shaft 24 on which is a cylinder 25 formed from the desired metal. The cylinder 25 is considered as a solid roll, and is formed entirely from the metal used. It is retained from the shaft 24 and guarded against accidental displacement by means of a collar 26 and a set-screw 27. The roll 25 is smoothed off and given a high polish to present a good surface which will not injure the sheet when contacting therewith.

In Fig. 5 is shown a modification wherein the shaft 28 carries a core 29 of a relatively cheap form of metal over which is arranged a skin or thin shell 30 of the non-corrosive metal. Relative movement between the shell 30 and the core 29 may be prevented by countersinking set-screws 31 as illustrated.

Instead of the single rows of rolls 19 in Fig. 1, sets or pairs of rolls 43 are used in the Fourcault machine. These rolls, like the other rolls in the past, have been formed from an asbestos or similar composition, and due

to the pressure of the rolls against the sheet considerable damage has been done to the surfaces of the sheet. By forming the rolls from a non-corrosive heat-resisting metal such as nickel, Monel, nichrome, stellite, etc., no surface damage is done to the sheet being annealed.

Although nickel or Monel metal have been specified as the most desirable metals for use in this connection, it is to be remembered that other metals, such as nichrome and stellite which will not corrode, and which can be given a relatively high polish, are adaptable for this use. By constructing the rolls as set forth in Fig. 5, a considerable expense is saved. The nickel or other metal used is somewhat more expensive than the cheaper core 29, and in view of this fact the shell can be made as thin as possible consistent with good mechanical design. Of course the rolls can be made in single lengths instead of the sections as shown in Fig. 2, but either form will work satisfactorily and will give much better results than the old type of asbestos rolls.

It is to be understood that the form of the invention herewith shown and described is to be taken as the preferred embodiment of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Claims:

1. In an annealing leer for use in sheet glass apparatus, a plurality of sectional rolls, the joints of the sections of the roll being staggered with relation to the adjacent rolls.

2. In an annealing leer for use in sheet glass apparatus, a plurality of sectional rolls, the joints of the sections being staggered with relation to the joints of the adjacent rolls, said sections being formed from a non-corrosive metal.

3. In an annealing leer for use in sheet glass apparatus, a plurality of sectional rolls, the joints of the sections being staggered with relation to the joints of adjacent rolls, said sections being formed from a relatively soft metal.

Signed at Toledo, in the county of Lucas, and State of Ohio, this 28th day of September, 1925.

WILBUR F. BROWN.