

No. 822,357.

PATENTED JUNE 5, 1906.

N. FRANZEN.
WIRE GLASS MACHINE.
APPLICATION FILED JUNE 9, 1905.

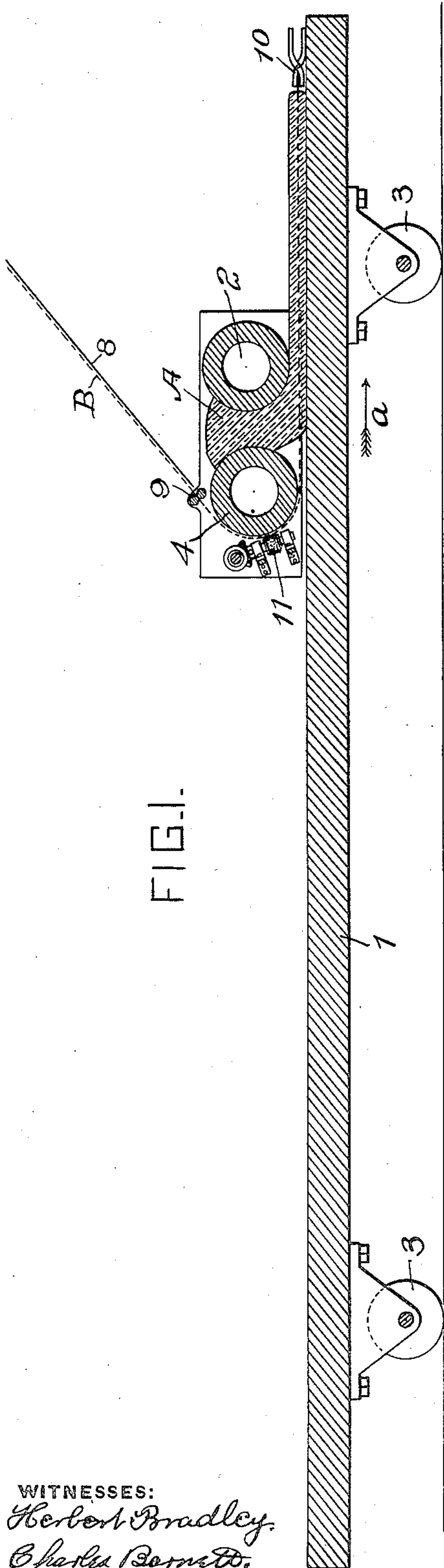


FIG. 1.

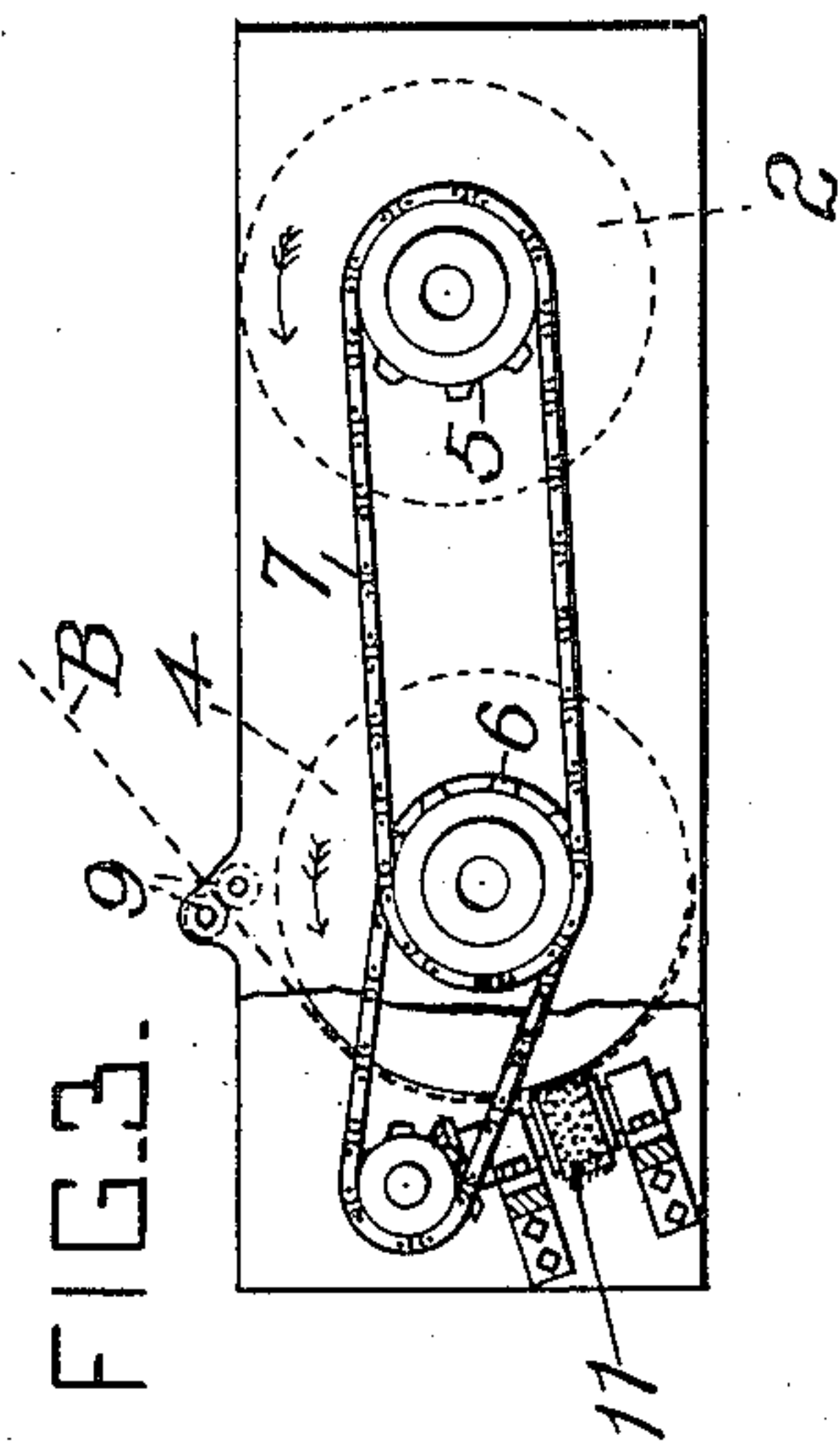


FIG. 3.

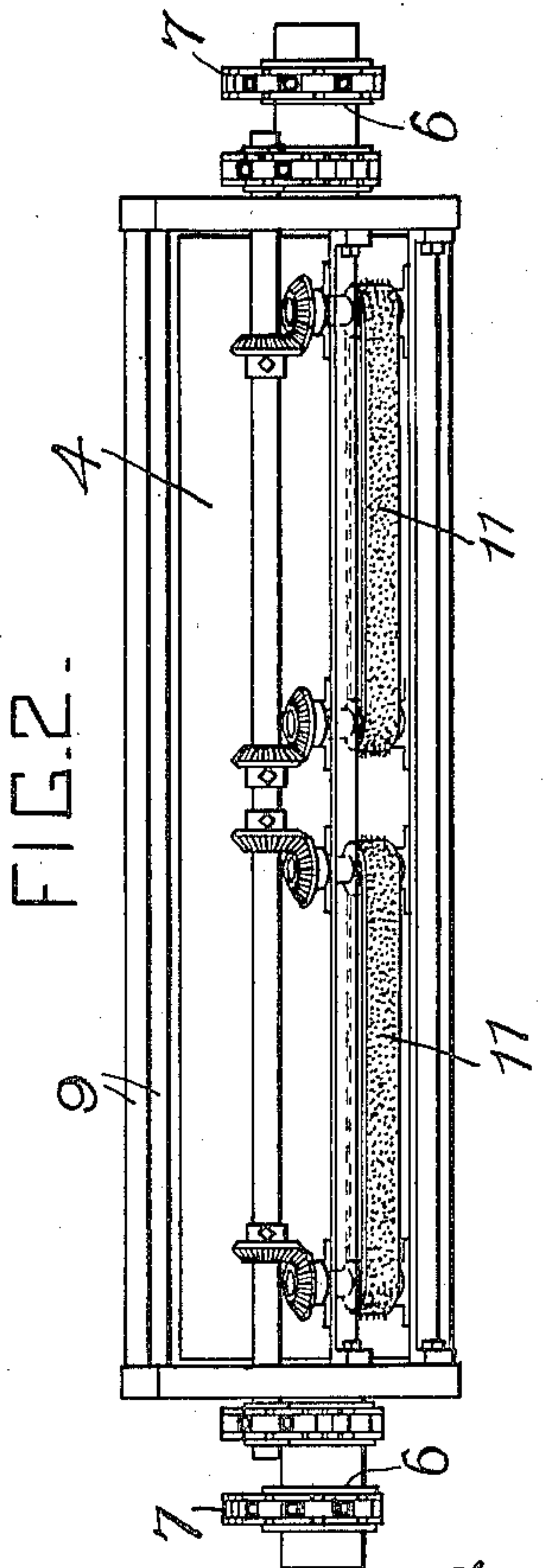


FIG. 2.

WITNESSES:
Herbert Bradley,
Charles Berner.

Nicklas Franzen, INVENTOR
by Christy and Christy,
Atty's.

UNITED STATES PATENT OFFICE.

NICKLAS FRANZEN, OF DUNBAR, PENNSYLVANIA, ASSIGNOR TO
WILLIAM L. MUNRO, OF PITTSBURG, PENNSYLVANIA.

WIRE-GLASS MACHINE.

No. 822,357.

Specification of Letters Patent.

Patented June 5, 1906.

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To all whom it may concern:

Be it known that I, NICKLAS FRANZEN, a citizen of the United States, residing at Dunbar, in the county of Fayette and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Wire-Glass Machines, of which improvement the following is a specification.

My invention relates to machines for making wire-glass; and the object of my improvement is the production of a superior article—a sheet of wire-glass in which defects of usual occurrence are overcome.

My improved machine is illustrated diagrammatically in the accompanying drawings, in which—

Figure 1 is a longitudinal section thereof; and Figs. 2 and 3 are views in elevation and on larger scale of details thereof.

Parts which reappear in the several figures bear the same reference characters in each instance.

The machine to which my improvement is applicable includes in its structure a forming-surface, upon which molten glass is distributed into a sheet by suitable means. The forming-surface is preferably a table 1, and there is a spreader or means for distributing the glass, preferably a forming-roll 2. The table and the roll are movable with respect to one another to the end that the roll traversing the surface of the table shall form a batch of glass into a plate or sheet. Such an arrangement is well known. I have indicated in the drawings such relative movability, the table 1 being mounted on wheels 3 to permit the table to travel beneath roll 2. An arrow *a* indicates the direction in which the table moves beneath the forming-roll in spreading a sheet or plate. A batch of glass *A* is teemed in front of roll 2, (in front with respect to its progress over the table.) The material to be incorporated, which in the present commercial product is a web of wire *B*, is fed beneath roll 2, and, as this roll advances, the sheet, with the included wire, is formed.

In front of forming-roll 2 I arrange a member adapted to maintain the web of wire at the desired distance from the forming-surface during the operation of the machine, to the end that in the finished article the wire shall lie in a predetermined and fixed position within the sheet of wire-glass, and this member has certain features which will presently be described. I preferably form

this wire-spacing member as a rotatable roll 4, parallel with roll 2, suitably spaced above the surface of table 1, being nearer thereto than roll 2, and mounted to traverse the table in unison with roll 2. I preferably arrange the rolls 2 and 4 to rotate in a common direction. Suitable means to this end are indicated by sprocket-wheels 5 6 and a connecting-chain 7. The web of wire *B*, passing from a suitably-arranged chute 8 and between flattening-rolls 9, is received upon the surface of roll 4, passes beneath that roll, and enters the pass between roll 2 and the table 1.

A difficulty heretofore experienced in making wire-glass is due to the expansion of the relatively cool wire when suddenly surrounded with molten glass, such expansion resulting in the displacement of the wire.

It is a feature of my improvement that I heat and expand the wire before it comes in contact with the molten glass and in so doing eliminate wholly or in part the objectionable expansion of the wire within the body of the glass. To this end means are furnished for heating roll 4, that the wire passing over its surface shall become heated and expand before entering the molten glass. My preferred means for heating roll 4 accomplishes not only the ends alluded to, but accomplishes ends quite distinct and important, and these will presently appear. Roll 4 is placed in such proximity to roll 2 that the opposite surfaces of the two rolls form a hopper-like receptacle for the molten glass. From this receptacle the glass is fed downward by the action of gravity and by the progressive movement of the rolls above the table is fed into the pass between roll 2 and the table. The roll 4 rotating in contact with molten glass becomes heated and imparts heat to the wire passing over its opposite surface in the manner and for the purpose described. Such an arrangement of rolls 2 and 4, forming a receptacle for the batch of molten glass, keeps the latter compact and protects it from cooling contact with the table and to a great extent from the air, (thus preventing "freezing" and avoiding the defects consequent thereon.) Furthermore, the batch being thus protected from cooling, successive batches may be poured, and each will mix freely with the glass remaining in the receptacle. Thus the rolling of larger sheets or a continuous operation of the machine is made possible.

While a wire-spacing member such as roll

4 will alone serve to maintain the web in position as the rolling operation progresses, I prefer when rolling sheets of definite size to employ a clamp for the web at the point
 5 where the formation of the sheet begins, such a clamp cooperating with the wire-spacing member to hold the web in place from the beginning of the rolling operation. My preferred form of clamp is indicated in the
 10 drawings at 10. It consists of a pair of tongs with jaws of sufficient width to properly secure the web. These tongs travel with the table, and their lower jaw is of such dimensions as to hold the web in the desired position
 15 above the table. It will be understood that by the tongs employed for this purpose I may draw the completed sheet from the table to the annealing-oven, thus avoiding the necessity of gripping the sheet by another tool,
 20 with the consequent liability to mar the sheet to a greater or less extent.

It has heretofore been proposed to apply tension to the web of wire-netting during the forming operation in order to expand the wire
 25 at the parts where the strands are twisted and so compensate for the expansion due to heating (before alluded to) without displacement of the web as a whole. While I am able by proper adjustment of flattening-rolls
 30 9 to adapt them to cooperate with clamp 10 to produce such a tension as I have described, I reduce the necessity for such tension or eliminate it entirely by heating my wire-spacing member or roll 4. However, I may,
 35 if I find it desirable, apply both heat and tension to the wire.

Another feature of my invention consequent upon the use of such a wire-spacing member as roll 4 is the possibility of employing in connection therewith means for
 40 spreading the web laterally as it passes to the glass. By spreading the web I remove unevenness, and I may by proper tension expand the wire laterally to compensate in a
 45 greater or less degree for thermal expansion alluded to above. My preferred means for accomplishing such lateral spread consists of a pair of belts 11, equipped with wire
 50 tines, so that they form wire brushes. These belt-brushes, as indicated in Fig. 2, are arranged end to end and are so placed that as they move they brush against the web B. Means are provided for causing these brushes to brush over the web B in opposite directions
 55 from the middle of the web laterally outward toward its edges. My improved means are shown in the drawings and consist of gearing connected with the axle of roll 4. The brushes are preferably arranged to exert their
 60 expanding action upon the web while in contact with roll 4. Thus as the roll advances and the wire passes over its surfaces the brushes exert their spreading action.

I claim herein as my invention—

65 1. In a machine for making wire-glass the

combination with a forming-surface and a spreader for the glass movable in relation thereto, of a wire-spacing member arranged to maintain the material to be embedded in the desired position adjacent to the forming-
 70 surface and arranged to cooperate with the spreader to form a hopper-like receptacle for the molten glass, substantially as described.

2. In a machine for making wire-glass the combination with a forming-surface and a
 75 spreader for the glass movable in relation thereto, of a roll arranged to receive the material to be embedded, and to maintain the material to be embedded in the desired position adjacent to the forming-surface, and ar-
 80 ranged to cooperate with the spreader to form a hopper-like receptacle for the molten glass, substantially as described.

3. In a machine for making wire-glass the combination with a forming-surface and a
 85 spreader for the glass movable in relation thereto, of means for securing one end of the material to be embedded, and a member arranged to cooperate with said securing means to maintain the material to be embedded in
 90 the desired position adjacent to the forming-surface, and arranged to cooperate with the spreader to form a hopper-like receptacle for the molten glass, substantially as described.

4. In a machine for making wire-glass, the
 95 combination of a forming-table, a roll arranged above said table and movable relative thereto to spread molten glass into a sheet thereon, and a member arranged above said table nearer thereto than said roll and
 100 adjacent to said roll and movable in unison with said roll relatively to said table, such member being suitably spaced above the surface of the forming-table to maintain the fabric at the desired distance therefrom and
 105 suitably spaced from the spreading-roll to form therewith a hopper-like receptacle for receiving and sustaining a batch of molten glass and for allowing molten glass to descend by gravity therefrom through the fabric
 110 maintained in position as aforesaid to the surface of the forming-table, substantially as described.

5. In a machine for making wire-glass, the combination of a forming-table and a pair of
 115 rolls arranged above said table and in such proximity to one another as to form a hopper-like receptacle wherein molten glass may be poured and supported by gravity and from which such molten glass may descend by
 120 gravity between said rolls to the surface of said forming-table; said rolls being arranged to rotate in a common direction and to traverse in unison the surface of the forming-table, one of said rolls being spaced above
 125 the surface of the forming-table to maintain at a predetermined distance therefrom the material to be embedded, and the other roll being spaced to distribute upon said forming-table and about such material the molten
 130

glass descending between said rolls, substantially as described.

6. In a machine for making wire-glass the combination of a forming-surface, a roll arranged above said surface rotatable on its axis and movable relative to said forming-surface to spread molten glass in a sheet thereon, and a second roll arranged above said table rotatable on its axis in uniform direction with the spreading-roll and movable in unison with the spreading-roll relative to said forming-surface and cooperating with the spreading-roll to constitute a hopper-like receptacle wherein molten glass may be retained by gravity and from which the molten glass may descend by gravity to the forming-surface, substantially as described.

7. In a machine for making wire-glass the combination with a forming-surface and means for spreading the glass thereon, of a member for receiving the material to be embedded and for maintaining the material to be embedded in the desired position adjacent to the forming-surface, and means for spreading the material to be embedded laterally upon said member, substantially as described.

8. In a machine for making wire-glass, the combination of a forming-surface, a member for receiving the material to be embedded and for maintaining the material to be em-

bedded in the desired position relative to the forming-surface, a pair of outwardly-movable brushes for spreading the material to be embedded laterally upon said member, and means for imparting motion to said brushes, substantially as described.

9. In a machine for making wire-glass, the combination of a forming-surface, a rotatable roll for receiving the material to be embedded and for maintaining the material to be embedded in the desired position relative to the forming-surface, and means operative upon the rotation of the roll for spreading the material to be embedded laterally thereon, substantially as described.

10. In a machine for making wire-glass the combination of a forming-surface, a spreader for the glass movable in relation thereto, and means for holding the material to be embedded as against longitudinal movement and in proper spacial relation to said forming-surface during the forming operation and for removing from said forming-surface the finished sheet when the forming operation is completed, substantially as described.

In testimony whereof I have hereunto set my hand.

NICKLAS FRANZEN.

Witnesses:

W. H. WILLIAMS,
THOS. N. TAYLOR.