

(No Model.)

2 Sheets—Sheet 1.

F. SHUMAN.
MACHINE FOR EMBEDDING WIRE NETTING IN GLASS.

No. 483,020.

Patented Sept. 20, 1892.

FIG. 7.

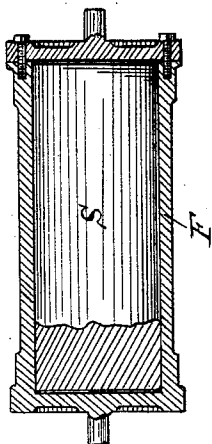
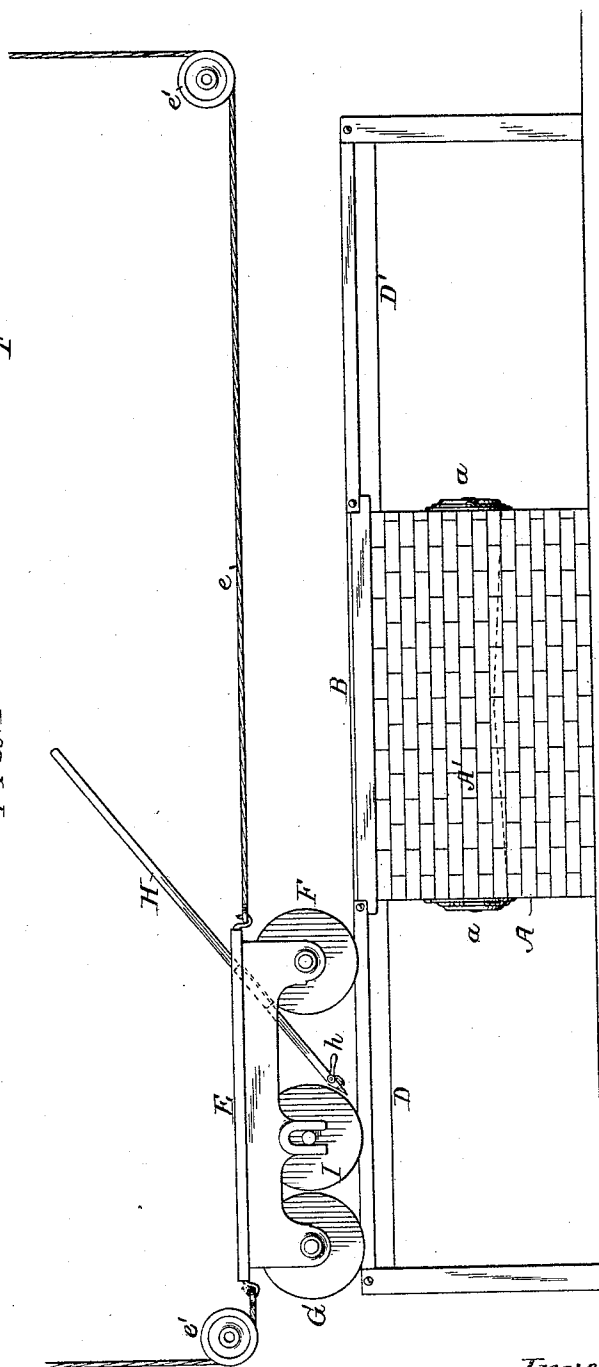


FIG. 6.



FIG. 1.



Witnesses:
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Inventor:
Frank Shuman
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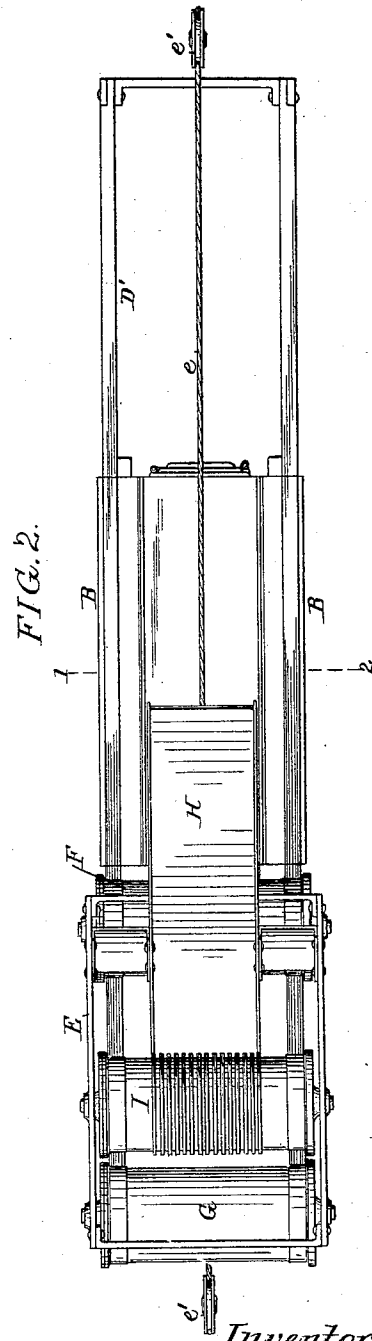
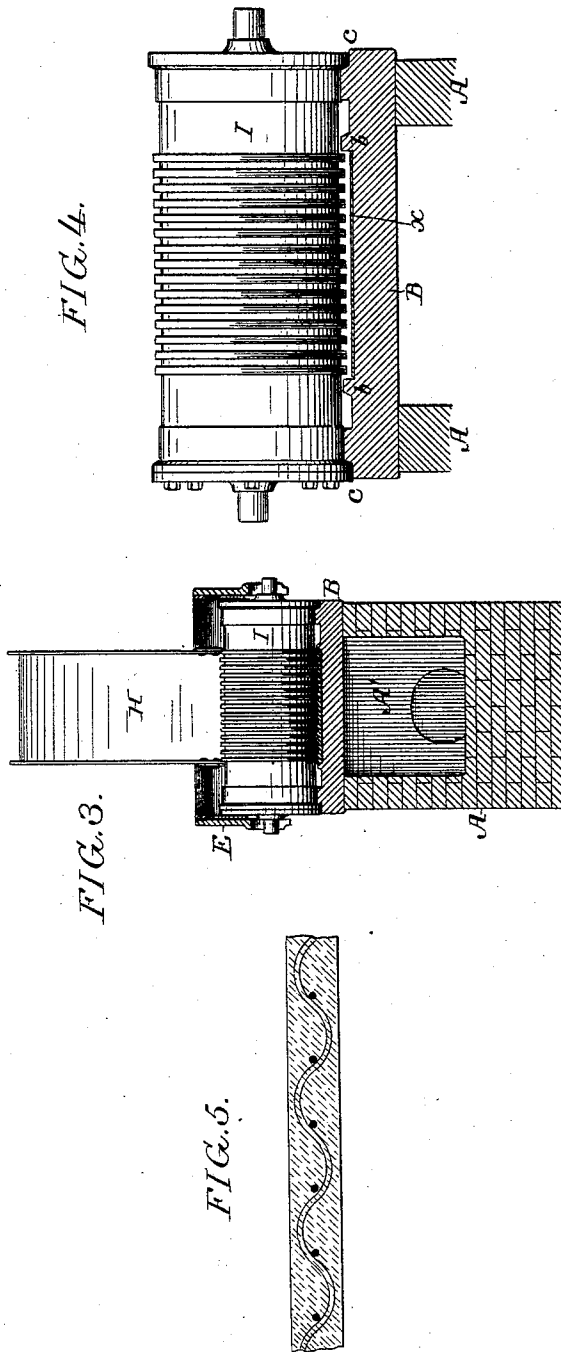


FIG. 5.



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UNITED STATES PATENT OFFICE.

FRANK SHUMAN, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR EMBEDDING WIRE-NETTING IN GLASS.

SPECIFICATION forming part of Letters Patent No. 483,020, dated September 20, 1892.

Application filed July 6, 1892. Serial No. 439,146. (No model.)

To all whom it may concern:

Be it known that I, FRANK SHUMAN, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented an Improved Machine for Embedding Wire-Netting in Glass, of which the following is a specification.

The object of my invention is to construct a machine for rolling what I term "wire-glass"—that is, sheet-glass having embedded in it wire or wire-gauze. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of my improved machine for rolling wire-glass. Fig. 2 is a plan view. Fig. 3 is a transverse sectional view on the line 1 2, Fig. 2. Fig. 4 is an enlarged view of part of Fig. 3. Fig. 5 is a sectional view of the glass after being rolled. Fig. 6 is a view illustrating a modification of my invention, and Fig. 7 is a sectional view through one of the rollers.

The machine is constructed to carry out my improved process for making wire-glass, for which I have applied for Letters Patent, application bearing even date herewith, and it is designed to roll the glass, for which I have also made application for patent, filed even date herewith; but it will be understood that it may roll glass in which the wire is not corrugated, as claimed in the above-mentioned application.

In the accompanying drawings, A is a furnace.

A' is a combustion-chamber of the ordinary construction, *a* being the fire-doors. I have shown in the drawings two fire-doors, one on each side of the furnace, indicating a double furnace; but it will be understood that a single furnace may be used without departing from my invention, and in some instances oil or gas may be used in place of coal or wood.

B is the table upon which the glass is rolled, this table being mounted on the furnace and heated thereby. The table is preferably made of heavy cast metal, and on each side of the table are ribs *b b* of sufficient height to allow for the proper rolling of the glass, and on the outer edges of the table are rails *c c*, upon which the rollers travel. The space between the rails and the ribs may receive any superfluous glass forced out by the action of the

rollers. I place in the bottom of the space, between the ribs *b b*, a thin sheet of steel *x*, upon which the glass is rolled and by which the glass is removed from the table. On each side of the table are rails *D D'*, supporting the carriage before and after it has passed over the table. These rails are mounted in any suitable manner and are in line with the rails *c c* of the table.

E is the carriage having a front roller F and a rear roller G. This carriage is moved across the table in any suitable manner. I have shown in the drawings a wire rope *e*, passing around sheaves *e'* at each end of the machine and connected to any suitable hand or power device for moving the table. It will be understood that other means may be employed for moving the carriage without departing from my invention. The roller F is the front roller, and acts to smooth out the molten glass after it is poured out upon the table, preparing it for the reception of the wire-gauze.

H is an inclined chute arranged at the proper angle and has a trigger or other stop *h* at its lower end to detain the gauze placed thereon until the proper time to discharge it upon the glass. The wire-gauze is preferably heated to the proper degree, so that it will not chill the glass when it is placed thereon. Directly back of the chute H is a roller I, independently mounted in the carriage and having, preferably, a series of annular ribs *i*, so arranged in respect to the table as to press the wire-gauze into the molten glass. The ribs are so arranged that while all the wire is submerged in the molten glass a portion of the wire-gauze is pressed to a greater extent than other portions, thus corrugating the wire within the glass, as shown in Fig. 5. The rear roller G passes over the glass and closes up the openings made by the ribbed roller and wire, completing the rolling of the glass. The finished glass is then removed with its plate and placed in an annealing-furnace. After the glass has been annealed I preferably cut off any glass projecting over the edges of the wire-gauze, after which the glass is ready for the market. The wire is preferably cut to the proper size prior to its application to the glass. The rollers F and G support the car-

riage, and the roller I is so mounted in the carriage that it is free to rise or lower independently of the carriage. Thus by raising this roll when the carriage is returning it will be clear of the glass.

In order to properly roll the glass, I make each of the rolls F, G, and I hollow and provide them with removable heads and mount within each roller a highly-heated core S, as shown in Fig. 7, thus heating the roller to the proper heat, so as not to chill the glass during the process of rolling.

While I prefer to roll into the glass sheets of wire-gauze, or, in other words, wire which has been woven, I may roll into the glass lengths of wire or thin metal strips, and when wire is used I make the chute in sections, as shown in Fig. 5, partitions dividing the chute into channels, so that the wire will be arranged at proper distances apart for the purpose specified. In some instances, also, the wire-gauze, instead of being flat and corrugated in the glass, may be corrugated first and then simply pressed into the glass, or when it is not wished to have the wire corrugated I may simply press it into the glass and cover it without corrugating it.

My invention is especially useful for making glass for the skylights of buildings, such as railroad-depots, conservatories, &c., or it may be used (the wire being preferably thicker) for vault-lights, pavements, floors, &c., the thickness of glass depending upon the use to which it is put. By having the trigger upon the chute for the wire-gauze I am enabled to place the wire on the glass at any point on the table, so that if the glass is not perfect at the forward edge I need not necessarily embed the wire in this imperfect portion, but can allow the rolls to pass over the glass until a perfect point is reached, when the trigger can be operated and the wire-gauze released, as, it will be understood, it is very hard to cut the glass when the wire is embedded in it.

I claim as my invention—

1. The combination, in a machine for manufacturing wire-glass, of the table upon which the molten glass is poured, a roller for smoothing out said molten glass, a carrier for the wire or wire-gauze, situated back of the smoothing-roller, and a finishing-roller for closing the openings in the glass made by the wire or wire-gauze, substantially as described.

2. The combination of the bed for the glass, the carriage, the first smoothing-roller, a ribbed roller, and a finishing-roller for smoothing the glass after the ribbed roller has passed over it, with a chute or guide for the wire, situated between the first roller and the ribbed roller, substantially as specified.

3. The combination of the furnace, the table mounted above the furnace, a carriage, three rollers mounted thereon, the first roller

being the first smoothing-roller, the second roller having ribs for depressing the wire into the glass, and the third roller being the final smoothing-roller for closing the openings formed by the ribbed roller, with mechanism by which the carriage is drawn over the table, substantially as described.

4. The combination of the table, a heating device therefor, rails on the table, rails at each end of the table in line with the said rails on the table, the carriage, two smoothing-rollers thereon, and a central depressing-roller for the wire and a chute upon which the wire is mounted, said chute being situated between the forward smoothing-roll and the depressing-roll, substantially as described.

5. The combination of the table, longitudinal ribs thereon for confining the glass, with a plate resting between the ribs upon which the glass is rolled, with rollers for smoothing the glass and for forcing the wire into the glass, substantially as described.

6. The combination of the table, a device for heating the same, longitudinal ribs on the table, longitudinal rails on the outer edge of the table, rails at each end of the table aligning with the rails on the table, a carriage, mechanism for drawing the carriage over the table, said carriage having a primary smoothing-roll and a finishing smoothing-roll and a central ribbed roll, a chute carried by the carriage, with heating appliances for the rolls, so that they will not chill the glass during the process of rolling, substantially as specified.

7. The combination of the table, the rails, the carriage, the forward smoothing-roll and the rear smoothing-roll, a central ribbed roll, an inclined chute for the wire, with a trigger holding the wire in the chute, substantially as specified.

8. The combination of the furnace, the table mounted thereon, rails on the table, ribs to prevent the glass from spreading, rolls adapted to the rails, the forward roll and rear roll being smoothing-rolls, ribs on the central roll, each of said rolls being hollow and having removable heads, with cores in said rolls adapted to be heated, with a chute for the wire, said chute being situated between the forward roll and the ribbed roll, substantially as specified.

9. The combination of the table, the carriage, supporting-rolls therefor, with a ribbed roll mounted loosely in bearings on the carriage, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK SHUMAN.

Witnesses:

H. F. REARDON,
HENRY HOWSON.