

Jan. 10, 1933.

R. P. TURNER

1,893,830

WIRE FABRIC

Filed Dec. 18, 1930

2 Sheets-Sheet 1

Fig. 1.

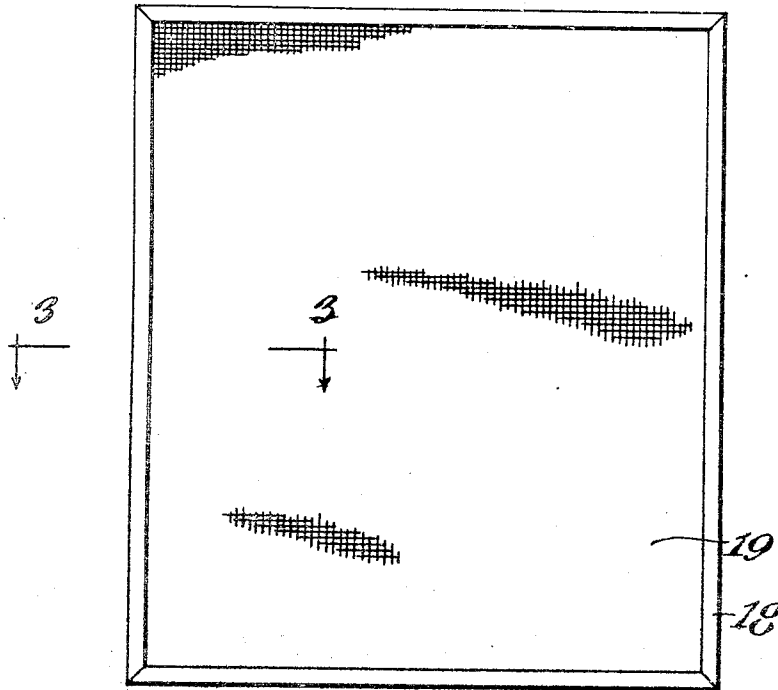


Fig. 2.

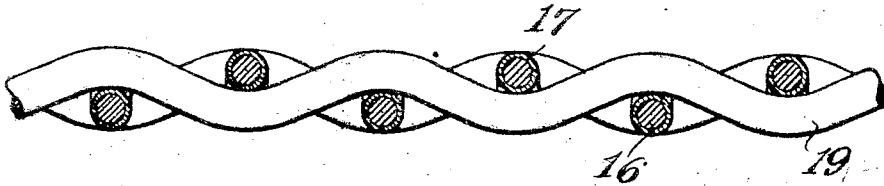
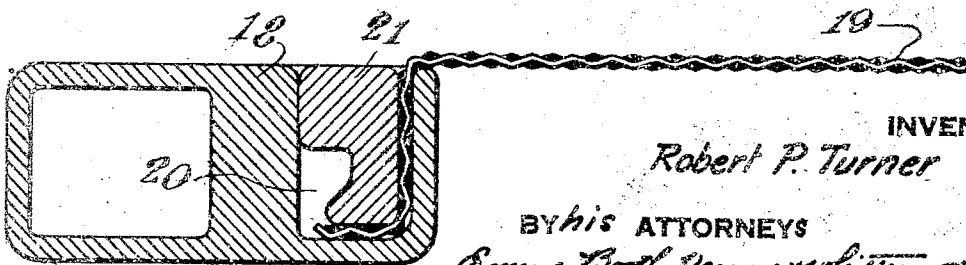


Fig. 3.



INVENTOR

Robert P. Turner

BY *his* ATTORNEYS

Emory Booth, Danny Robinson

Jan. 10, 1933.

R. P. TURNER

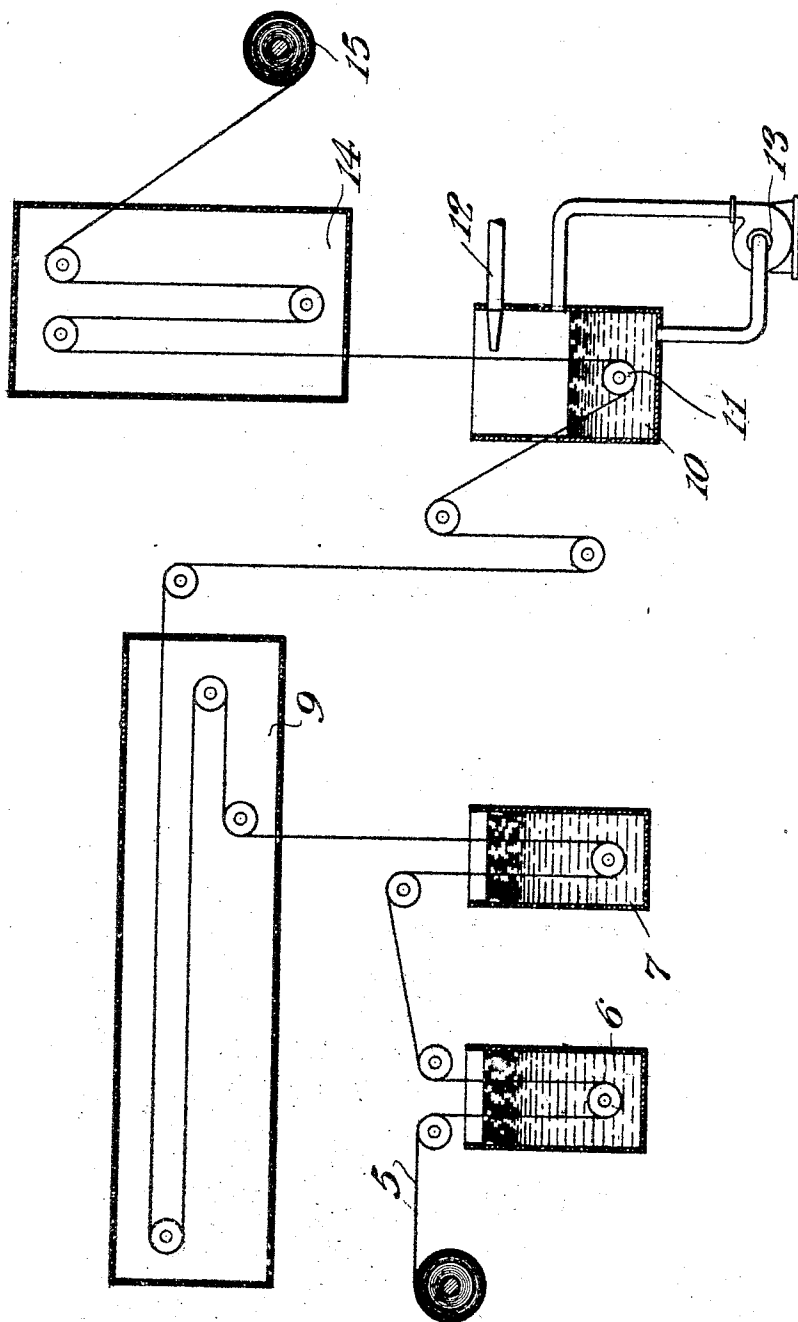
1,893,830

WIRE FABRIC

Filed Dec. 18, 1930

2 Sheets-Sheet 2

Fig. 4.



INVENTOR
Robert P. Turner

BY *his* ATTORNEYS
Emory Booth, Varny & Whittemore

UNITED STATES PATENT OFFICE

ROBERT P. TURNER, OF YORK, PENNSYLVANIA, ASSIGNOR TO NEW YORK WIRE CLOTH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

WIRE FABRIC

Application filed December 18, 1930. Serial No. 503,174.

This invention relates generally to wire fabrics and to methods of producing such fabrics.

screen showing one embodiment of this invention.

Fig. 2 is an enlarged sectional view of a portion of the wire cloth shown in Fig. 1.

Fig. 3 is a similar view on the line 3—3 of Fig. 1, and

Fig. 4 is a diagrammatic view of one arrangement of apparatus adapted to carry out the method of producing the cloth shown in Figs. 2 and 3.

The demand for wire fabrics which would be not only highly resistant to corrosion but also have a good and uniform appearance of lasting character, has never been completely satisfied. Fabric made from steel wire, even when suitably covered with a protective coating, rapidly deteriorates and rusts away. Copper or bronze fabric when first subjected to weather acquires a coating which for a time produces a spotty appearance and which is transferred to adjacent structures by the first rain where it forms a permanent stain that cannot be removed. Recently, aluminum has become popular in numerous fields because of its light weight and attractive appearance, but its utility in many cases such, for example, as frames for window or door screens, or other framing and supporting members, has been practically nullified by the fact that no satisfactory fabric was suitable for use in connection with it. For example, in the case of screens, a bronze wire cloth when used with an aluminum frame results in a destructive electrolytic action. Aluminum fabric could not be used with aluminum framing or supporting members because of its mechanical weakness, although its appearance was exactly the appearance desired and, of course, no electrolytic action would occur if an aluminum fabric were employed with aluminum framing or supporting members.

An object of this invention is to provide a practical, durable and rugged wire fabric and in one specific embodiment to provide a wire cloth having the requisite strength and other characteristics to render it satisfactory for use as a screen cloth. A further object is to provide a method of continuously producing such wire fabric.

These and other objects which will be apparent to those skilled in this particular art are accomplished by means of the invention hereinafter described, one example of which is illustrated in the accompanying drawings in which—

Fig. 1 is a front elevation of a window

In order to provide a wire having the qualities necessary to permit its being woven or otherwise fabricated and which at the same time will provide a fabric or cloth capable of being successfully used with aluminum supports or frames, I preferably employ an aluminum base alloy of such characteristics as to provide the necessary qualities. An aluminum alloy having approximately 6% magnesium will be found satisfactory although obviously other proportions can be used as well as other alloying metals. Under some circumstances it may even be desirable to use a metal other than aluminum providing such metal has an electrolytic potential approximating that of aluminum. Wire made from such material can be satisfactorily fabricated so as to provide a fabric capable of use with aluminum framing or supporting members such, for example, as the frames of window screens. In the case of screen cloth, however, this fabric has an undesirable bright finish and other defects in appearance which render it unsuitable for most purposes. Moreover, the alloying of aluminum with other suitable metals, for example, with magnesium, increases tensile strength but has a tendency to decrease the valuable corrosion-resisting properties of aluminum.

In order to provide the desired finish in the case of screen cloth, and in all cases to produce a corrosion-resisting surface, the fabric is provided with a shell or coating of metallic aluminum, preferably by being passed through a suspension of aluminum powder in a suitable vehicle. The vehicle is preferably a spar varnish prepared so as to mix properly with the aluminum powder and to have the viscosity, rate of drying, film thickness and the like, suitable for working with

aluminum. Immersion of the wire fabric in the aluminum bath forms one step in a continuous process of treating the fabric, which process is diagrammatically illustrated in Fig. 4. As therein shown, the untreated wire fabric 5 is drawn from a supply reel through a cleaning bath 6 where it is subjected to a chemical which thoroughly cleans the surfaces of the wires, the fabric passing over rollers in the cleaning bath. The cleaned fabric is then carried through a suitable rinsing tank 7 where it again preferably passes over rollers and is then carried upwardly through a suitable drying zone 9 in the form of a drying oven or the like. The chemically clean, dry, uncoated fabric is then immersed in a coating bath 10 where a shell or coating of pure aluminum is deposited upon the wire of the fabric. In this bath, the fabric passes around a submerged roller 11 so that a rolling action of the wires upon each other is produced. This rolling operation exposes every particle of the surface of each wire to the coating operation so that an aluminum shell is formed completely surrounding each wire even where it crosses or contacts with the other wires. In the case of screen cloth or other close mesh fabric an air blast 12 is provided above the bath for blowing through the coated fabric to remove surplus material therefrom. Because of the peculiar nature of the aluminum powder, it is necessary to maintain a continual agitation of the aluminum bath to ensure uniform suspension of the powder therein and to prevent its collecting on the bottom of the container. This agitation can be accomplished in any desired manner, but as illustrated is obtained by a pump 13 connected to the container so as to draw the material from the bottom of the tank and deliver it to the top thereof, thus maintaining a constant circulation and agitation of the bath. The coated fabric is then passed through a suitable drying oven 14 from which it is delivered to a reel 15 and wound into the usual coils.

The entire operation is continuous and produces an aluminum-surfaced wire fabric having a suitable strength-providing core. The aluminum powder consists of small flake-like particles of pure aluminum which overlap and unite when applied to the wire surface so as to form a corrosion-resisting aluminum-surfaced wire having a strength-providing core 16 formed of an aluminum alloy or other suitable metal which will not produce any destructive electrolytic action with either the aluminum shell 17 or an associated aluminum supporting structure or frame 18. In the finished fabric, the aluminum shell 17 includes a certain amount of the dry vehicle in which the aluminum powder was suspended and, inasmuch as aluminum is impervious to light, it has a retarding effect upon the oxidation of such part of the vehi-

cle as remains in the coating and postpones deterioration thereof. At those points where different wires cross or contact with each other, the aluminum surfaces of the different wires adhere and have a stiffening effect upon the finished cloth.

In the case of screen cloth an aluminum frame for use therewith can be of any desired construction and arranged for use in any desired manner. That illustrated in the drawings is a window screen frame, having a recess 20 for receiving an edge of the screen cloth which is held in place by any suitable clamping means 21.

An unusual advantage of wire fabric, whether screen cloth or other desired form, made in accordance with this invention is its resistance to the spreading of any rust spot or the like which may form at some point where the coating has been removed. Unlike galvanized or enamelled wire fabric in which such spots spread rapidly over a large area, any rusting or corroding of the core within the aluminum shell, or at a bare spot, will not creep or enlarge. This characteristic combined with its resistance to corrosion provides a fabric having a prolonged period of use.

I claim as my invention:—

1. A wire screen cloth comprising wire strands having a strength-providing aluminum alloy core and a corrosion-resistant outer surface of aluminum, the coating of the separate strands adhering where said strands cross to produce a stiffening effect upon the cloth.

2. A wire cloth, adapted for use with a supporting member of metal having an electrolytic potential approximating that of aluminum, comprising a wire fabric formed of a relatively strong aluminum alloy wire incapable of destructive electrolytic reaction with the material of said frame, and a corrosion-resistant aluminum surface surrounding said wire.

3. An article of manufacture comprising in combination a slotted supporting frame formed of a metal having an electrolytic potential approximating that of aluminum, a wire fabric mounted on and secured in the slot of said frame and having a substantially pure aluminum surface and a metallic strength-providing core incapable of destructive electrolytic reaction with the material of said frame.

4. A wire screen cloth, adapted for use with a supporting frame formed of a metal having an electrolytic potential approximating that of aluminum, comprising a wire fabric having a substantially pure aluminum surface and a strength-providing core of aluminum magnesium alloy.

5. The method of producing aluminum-surfaced wire fabric which consists in providing a wire of a material relatively strong-

er than pure aluminum, forming a fabric from said wire and subsequently forming an aluminum shell around the wire of said fabric by continuously passing said fabric through a suspension of aluminum.

6. A method of producing an aluminum-surfaced wire screen cloth which consists in forming a wire from an aluminum alloy, weaving said wire to form a screen cloth and continuously and successively cleaning, rinsing and drying said cloth and thereafter passing said cloth through a suspension of aluminum while agitating the suspending medium.

15 In testimony whereof, I have signed my name to this specification this 16th day of December, 1930.

ROBERT P. TURNER.

20

25

30

35

40

45

50

55

60

65