

United States Patent

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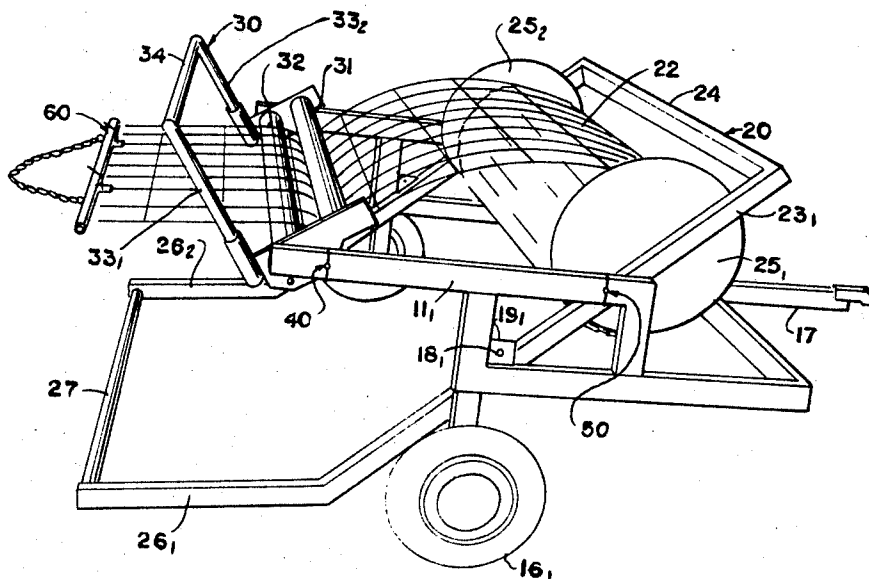
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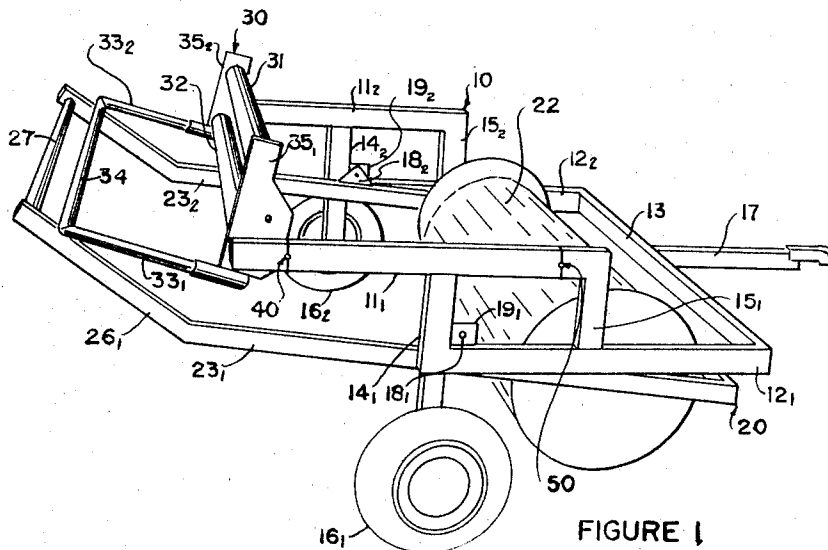
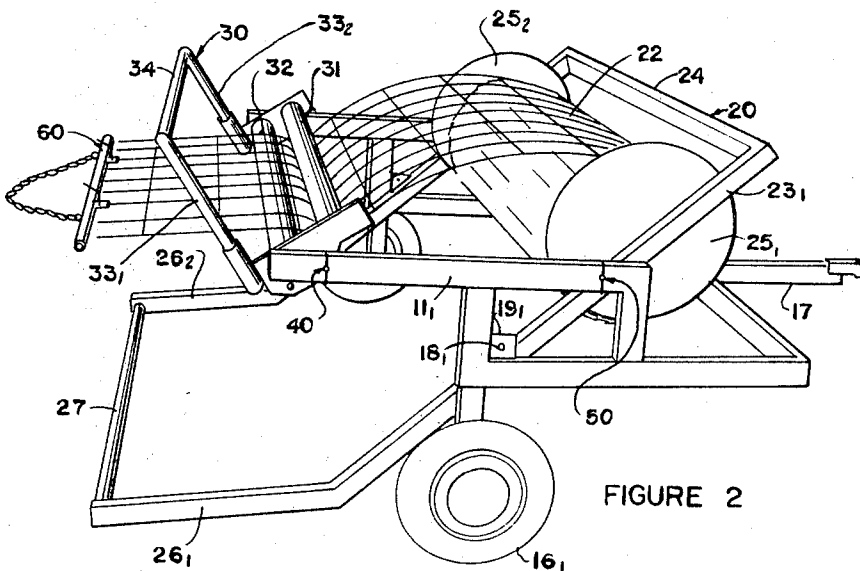
[54] **APPARATUS FOR STRAIGHTENING ROLLED
 WELDED WIRE FABRIC**
 9 Claims, 9 Drawing Figs.

[52] U.S. Cl. 72/166
 [51] Int. Cl. B21d 5/14
 [50] Field of Search 72/166,
 160, 164, 183; 140/107; 242/78.1, 86.5, 78.6, 78.7

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ABSTRACT: An apparatus, or press, for removing the set from rolled welded wire fabric to permit laying the fabric as continuous flat unbroken strips. The apparatus includes a frame, or carriage, which supports a first yokelike assembly pivotally mounted on the frame for receiving, and preferably for lifting, a roll of welded wire fabric to an elevated position for unreeling. A second yokelike assembly, also pivotally mounted upon the frame, is provided with a pair of rolls through which the end of the wire fabric is passed. Sufficient stress or force is applied by the coupling action of the rolls to unset the distortion or set produced by the rolled condition of the welded wire fabric.





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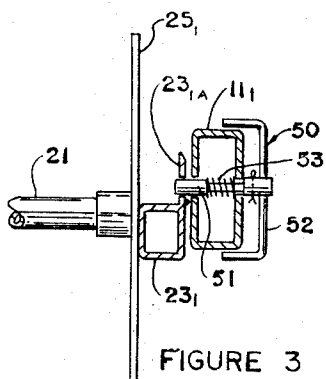


FIGURE 3

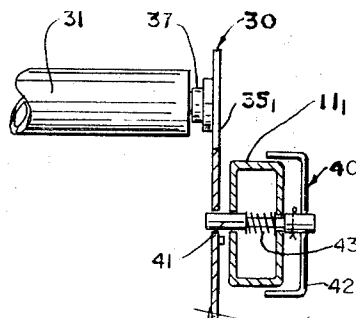


FIGURE 4A

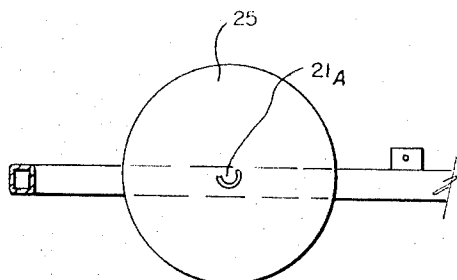


FIGURE 3A

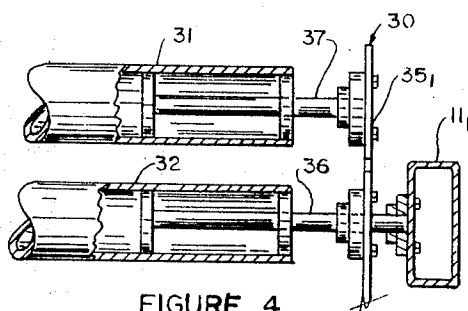


FIGURE 4

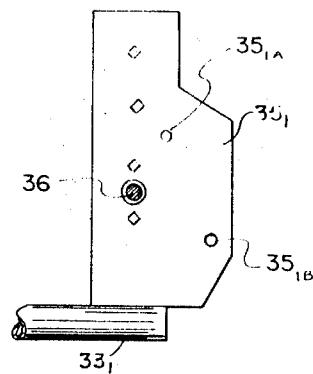


FIGURE 4B

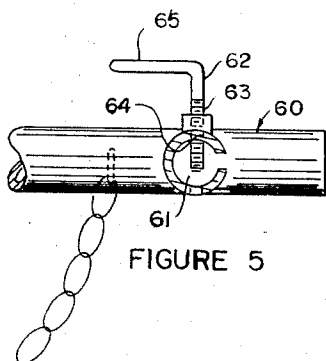


FIGURE 5

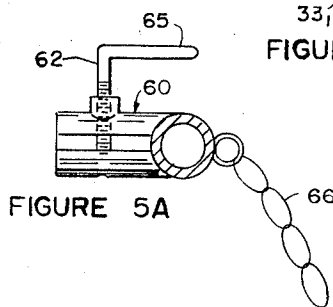


FIGURE 5A

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APPARATUS FOR STRAIGHTENING ROLLED WELDED WIRE FABRIC

Welded wire fabric, a material characterized by a network of transverse and longitudinal high-strength steel wires electrically welded at right angles each to the other, at regular intervals, is widely used in the construction industry for formation of concrete and other plasticlike slabs. Incorporation of the welded wire fabric into the slab during its formation increases the tensile strength of the finished slab minimizing cracking and, where cracks are formed, effecting their closure.

Styles, weights, spacing, gauges of wires and sectional areas vary quite widely. Typically, longitudinal wires are of 0.191-inch diameter with 4 to 12-inch spacing, and transverse wires are of 0.300-inch diameter with 6-inch spacing. The longitudinal wires can be of larger, smaller, or equal diameter and the spacing can be greater than, less than, or equal to the spacing of the transverse wires. Wire fabric is manufactured in widths ranging from about 3 to 13 feet, with wires in both lateral and transverse directions ranging up to one-half inch in diameter.

The welded wire fabric is furnished in sheets or rolls, the latter weighing several hundred to a thousand pounds, or more, and is generally placed in continuous, unbroken strips. For most applications it is necessary that the wire fabric be laid flat, whether it is lying directly against a concrete support surface or supported in a substantially parallel plane above the surface upon which concrete is to be poured. Thus, in a typical installation, the welded wire fabric is supported on chairs a few inches above the ground, and wet concrete is poured through the mesh to encompass and submerge the wire fabric, which becomes a part of the finished finally set reinforced concrete structure.

There is little difficulty involved in laying the wire fabric when it is furnished in flat sheets. When, however, the wire fabric is furnished in rolls, as is generally expedient, necessary, and desirable, a problem of considerable consequence is encountered. After unreeling or unrolling the welded wire fabric from the rolls, it is extremely difficult to lay the wire fabric in a flat position. The wire fabric retains a partial deformation or set from its former rolled condition and is straightened, if at all, only with difficulty. Usually, after straightening, it remains kinked to some extent. In any event, it is straightened sufficiently for laying in flat position only by expenditure of considerable effort, especially where the diameter of the longitudinal wires of the fabric are of relatively large diameter, and the separation between the wires is small, or both. Slab strength is reduced.

It is the primary objective of the present invention to obviate this and other disadvantages in utilizing rolled welded wire fabric laid as flat, unbroken, continuous strips.

In particular, it is an object to provide new and improved apparatus for removing the set from rolled welded wire fabric to permit laying the fabric as continuous, unbroken strips.

A more particular object is to provide a simplified, new and novel press for lifting and unreeling welded wire fabric, while removing the curvature or set to permit laying the fabric as flat, unbroken continuous strips.

These and other objects are achieved in accordance with the present invention which embodies apparatus comprising a frame, or carriage,

a transverse bar mounted between the branches or arms of a first yokelike member, or pair of arms extendable upwardly from the frame, for receiving a roll of welded wire fabric,

a second bifurcated or yokelike member provided with a separated pair of transverse rolls located between the branches of said member,

said second bifurcated or yokelike member being pivotally mounted upon the frame or an extension thereof,

whereby welded rolled wire fabric can be unreeled from the transverse bar, passed between the pair of rolls of the said second bifurcated or yokelike member, and force or stress ap-

plied by the coupling action of the rolls exerted in a direction which will unset the distortion or set produced by the rolled condition of the welded wire fabric.

In a preferred embodiment the transverse bar for holding the roll of wire fabric is mounted across the terminal ends, or near the terminal ends of the pair of arms, and the lower portions of the arms are pivotally connected upon the frame, or an extension thereof. More preferably, the lower portion, or portions, of the arms are provided with an extension, handle, or handles, to provide leverage for lifting the transverse bar to a more elevated position after a roll of welded wire fabric has been placed thereon. In use, the entire frame can be provided with wheels and transported by any suitable vehicle, or the frame can be mounted independently on a separate wheeled carriage. The welded wire fabric is readily pulled from its position on the transverse bar and passed through the pair of rolls by relative movement between the transported frame and a ground position, or vice versa.

The invention, and its principle of operation, will be more fully understood by reference to the following detailed description. In the description where numbers with subscripts are used in common with whole corresponding numbers, the whole numbers are used in generic sense and subscripts are used where there is a plurality of similar parts or components.

In the drawings:

FIG. 1 is an isometric view showing in some detail the basic units of the invention, as generally described above, and the interrelationship between these units;

FIG. 2 is generally similar to the preceding figure, and taken therewith shows progression of the means used in inserting a wire fabric roll at ground level and elevation of same for operative association with a pair of rolls for removing the set or deformation on unreeling;

FIGS. 3 and 3A are fragmentary cross-sectional views of mechanism for lifting and retaining, in locked position, the welded wire fabric roll while the latter is unreeled and unset;

FIGS. 4, 4A and 4B are fragmentary cross-sectional views of mechanism containing a pair of rolls for pressing and unsetting the welded wire fabric, said mechanism including means for locking the rolls in fixed relative position; and

FIGS. 5 and 5A are fragmentary front and cross-sectional views of a bar for attaching to the end of a wire fabric roll for pulling same through the pair of rolls.

Referring generally to FIGS. 1 and 2, there is shown a carriage 10 constituted of a frame formed by parallel bars 11, 11₂, 12, 12₂, the latter bars 12 being joined together through the transverse bar 13 while bars 11, lying in a plane above that formed by parallel bars 12, are joined to the latter via the bars 14, 14₂, 15, 15₂. Optionally, the lower terminal ends of the bars 14 are extended and provided with axles (not shown) on which are fitted wheels 16, 16₂. A tongue 17 is provided for pulling the carriage.

The frame or carriage 10 is provided with a pair of bifurcated or yokelike members 20, 30 pivotally connected thereupon. The former carries a detachable transverse bar 21 (FIG. 3) upon which a wire fabric roll 22 can be placed, at ground position (FIG. 1), and then elevated (FIG. 2), unreeled, and passed between the rolls 31, 32 of the second yokelike member 30. Stress or force is applied by the coupling action of rolls 31, 32 exerted in a direction which will straighten, i.e., remove, the distortion or set produced by the rolled condition of the welded wire fabric of roll 22.

Specifically, the yokelike member 20 is composed of a pair of parallel bars 23₁, 23₂ joined together by the fixed transverse bar 24. A detachable transverse bar 21 (FIG. 3), which rests in notches 21_A provided therefor between the shield members 25₁, 25₂, carries an insertable wire fabric roll 22. The bars 21, 23, 24 all lie in the same plane, and bars 23₁, 23₂ are adjoined to bars 26₁, 26₂, which, with the fixed lateral bar 27, lie in a different plane forming a handle for the yokelike member 20. The entire yokelike assembly 20 is connected to the carriage 10 via pivotal connections formed by the passage of pins 18₁, 18₂ through openings provided therefor within blocks 19₁, 19₂ secured to members 12₁, 14₁ and 12₂, 14₂, respectively.

The second yokelike member 30, specifically, is constituted of a pair of generally flat rectangular bars 35₁, 35₂ to which are joined parallel bars 33₁, 33₂, these in turn being adjoined via fixed transverse bar 34. A pair of rolls 31, 32 are transversely mounted across the rectangular bars 35₁, 35₂ via axles 36, 37 (FIG. 4) which extend through the rolls, such that the latter are capable of rotation about their axes. The axle 36 which extends through the roll 32 and rectangular bars 35₁, 35₂ is journaled upon bars 11₁, 11₂ of the frame to provide a pivotal connection for adjusting the angle of the pair of rolls 31, 32 relative to the direction of movement of the wire mesh withdrawn from roll 22 and passed between the rolls. The handle formed by lateral bars 33₁, 33₂ and transverse bar 34, which lie in a different plane from that of the rolls 31, 32 permits ready adjustment of this angle, and application of the desired amount of force to straighten or remove the distortion or set caused by the former rolled condition of the wire fabric.

Both of the yokelike members 20, 30 are pivotally connected to the carriage 10. Each, however, can be locked in fixed position as desired, by means of the locking mechanisms 40, 50. Identical locking mechanisms are generally located on both sides of the carriage 10, but description of one set of locking mechanisms 40, 50 is sufficient. A set of these mechanisms is shown by specific references to FIGS. 3, 4, 4A and 4B. FIG. 3 shows a locking mechanism 50 for fixing the yokelike member 20 in elevated position after it is raised from ground position and FIGS. 4, 4A and 4B show a mechanism 40 for fixing the yokelike member 30 in different positions, or stations. Generally, a vertical station facilitates passage of wire fabric between the rolls, while a second tilted position is employed to apply force on the wire fabric. Both locking mechanisms 40, 50 are generally similar and operate on similar principles.

Referring first to FIG. 3, there is shown a fragmentary cross-sectional view of the transverse bar 21 (without the welded wire roll 22), and the guide, guard or shield member 25, to which is secured the bar 23. The bar 23, is provided with a perforated plate section 23_{1A}, movable therewith. Transverse bar 21, shield member 25, and bar 23, are all movable together, and movable relative to the fixed bar 11, constituting a portion of the frame or carriage 10. The locking mechanism is defined by the presence of a pin 51, provided with a "U-shaped" handle 52, for holding the pin 51 in raised position (not shown) against the tension of compression spring 53. The spring 53 is positioned normally for holding the pin 51 in unlocked position when the handle 52 is turned at right angle to the position shown by reference to FIG. 3. When, however, the handle 52 is turned through 90° so that the ends thereof straddle bar 11, as shown by reference to FIG. 3, the end of the pin 51 is free to be dropped or thrust into an opening located in the perforated plate section of bar 23, to hold the yokelike member 20 in fixed elevated position, relative to bar 11. In use, the locking mechanism 50 is generally set in the latter position so that when the yokelike member 20 is elevated, the pin 51 will be thrust into the opening and locked. The same type locking mechanism can be conveniently used to lock the yokelike member 30 in desired position.

Referring specifically to FIG. 4, it is seen that the yokelike member 30 is provided with a pair of rolls 31, 32 mounted upon the generally rectangular bars 35₁, 35₂ by passage therethrough of the axlelike members 37, 36, respectively. The lower axle 36, in fact, extends through the rectangular bars 35₁, 35₂ and is journaled upon the bar 11₁, 11₂ of the frame. The upper axle 37 is journaled upon the rectangular bars 35₁, 35₂. If desired, the axle 37 can be adjoined to the rectangular bars 35₁, 35₂ so that both are adjustably displaceable upwardly or downwardly with respect to roll 32. In general, however, this is unnecessary.

Referring to FIG. 4A, there is shown a lesser fragmentary view of the mechanism described in FIG. 4 and a suitable locking mechanism 40 for securing the bar 35 in fixed pivotal position relative to bar 11. This locking mechanism, generally similar to that described by reference to FIG. 3, also includes a

pin 41, held in raised or lowered position by the positioning of the U-shaped handle 42 on bar 11. Two locking stations are provided. In the position shown, the handle 42 straddles the bar 11, so that the terminal end of the pin 41 is alternatively thrust, by action of compressed spring 43, into an opening 35_{1A} or 35_{1B} on rectangular bar 35₁ (FIG. 4B) to hold the yokelike member 30 in fixed vertical or tilted position relative to bar 11. In unlocked position, the rectangular bar 35₁ is released by lifting the pin 41 out of the opening as by rotation of handle 42 through a 90° angle. In freed position, the end of the pin 41 rides upon the plate between the openings 35_{1A} and 35_{1B}.

In unreeling wire from roll 22, it is desirable to employ, for convenience, a bar 60 adapted for attachment to the end or periphery of the wire. Such member is conveniently shown by reference to FIGS. 5 and 5A. The bar 60 contains a plurality of openings 61 for receiving individual longitudinal wire ends, these being retained within the said openings by tightening down the screw 62 thereupon. The screws 62, provided with external threads 63, are mounted within mating internally threaded opening 64 intersecting the larger openings 61. The ends of the screws 62 are tightened down by rotation of the handle 65 to cause the screw end to bear down on a longitudinal wire end. The two ends of a length of chain 66 are attached or secured to the opposite side of the bar 60 for use in unreeling the welded wire roll 22. The unreeling is done conveniently by either, securing the chain 66 in fixed position and pulling the carriage 10, or by securing the carriage 10 in fixed position while pulling on chain 66.

In operation, the transverse bar 21 is removed from the yokelike member 20, placed through the central opening inside a wire fabric roll 22, and the latter is transported and placed on the ground between the shield members 25₁, 25₂. The transverse bar 21, while in place, is easily moved inside the roll opening and set in place in the notches between the shields, as shown by reference to FIG. 1. By pressing downwardly on the handle 27, the roll 22 is elevated via the lever action of the yokelike member 20, and this position, shown by reference to FIG. 2, is readily held by clamping the said member in place by use of lock mechanism 50. This is done by releasing the pin 51 from its outward position, i.e., by turning handle 52 so that the ends thereof straddle bar 11, this permitting the terminal end of pin 51 to fall into an opening on plate 23_{1A} of bar 23, prior to or at the time the yokelike member is placed in elevated position.

The yokelike member 30 is similarly locked in suitable position via use of lock mechanism 40, first in vertical position. The pin 41 is thus thrust into opening 35_{1A} on rectangular bar 35₁, by releasing handle 42. A segment of wire fabric is unreeling and passed between the rolls 31, 32. The yokelike member 30 is then tilted forward to the position wherein the end of pin 41 is thrust into opening 35_{1B}. Force is uniformly exerted on the wire fabric by action of rolls 31, 32 and, as the wire is unreeling, the deformation caused by its former rolled condition is readily continuously removed, and the wire is straightened.

It is apparent that various changes and alterations can be made without departing the spirit and scope of the invention.

Having described the invention, what I claim is:

1. An apparatus for removing the set from rolled wire fabric to permit laying of the fabric as flat, unbroken, continuous strips comprising

a frame,

a first yokelike member pivotally attached at a position intermediate its extremities upon the said frame, one extremity of the said yokelike member providing a handle for application of leverage in elevating the opposite extremity of the yokelike member, the other extremity of the yokelike member branching into a pair of arms extendable upwardly from the frame when the said handle is moved downwardly,

a transverse bar detachably mounted between the pair of arms of the said branched yokelike member, for receiving the roll of welded wire fabric,

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a second yokelike member, pivotally mounted upon the frame, provided with a separated pair of transverse rolls located between the branches formed by the said yokelike member,

whereby welded rolled wire fabric can be placed upon the said transverse bar of the first yokelike member and elevated, unreeling from the roll, passed between the pair of rolls of the said second yokelike member, and force applied by the coupling action of the roll pair exerted in a direction which will remove the set caused by the rolled condition of the welded wire fabric.

2. The apparatus of claim 1 wherein locking means is provided for securing the said second yokelike member in position for application of force applied by the coupling action of the roll pair.

3. The apparatus of claim 1 wherein locking means is provided for securing the said first yokelike member in elevated position.

4. The apparatus of claim 1 wherein both the first and second yokelike members are provided with locking means for

retaining the members in position.

5. The apparatus of claim 2 wherein the locking means of the second yokelike member includes two locking stations, a first wherein the pair of rolls are held in vertical position to facilitate insertion of the wire between the rolls, and a second position for applying uniform force upon the wire unreeling from the roll.

6. The apparatus of claim 1 wherein the said first yokelike member is provided with fixed shields at the terminal end of and inside each of the branches, and receptacles opposite each for receiving the ends of the transverse bar.

7. The apparatus of claim 1 wherein the frame is provided with wheels to form a carriage.

8. The apparatus of claim 7 wherein the wheels which are provided are two in number.

9. The apparatus of claim 1 wherein the combination includes a bar for securing the wire ends of the unrolled wire, for applying uniform force thereto in unreeling the wire from the roll.

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