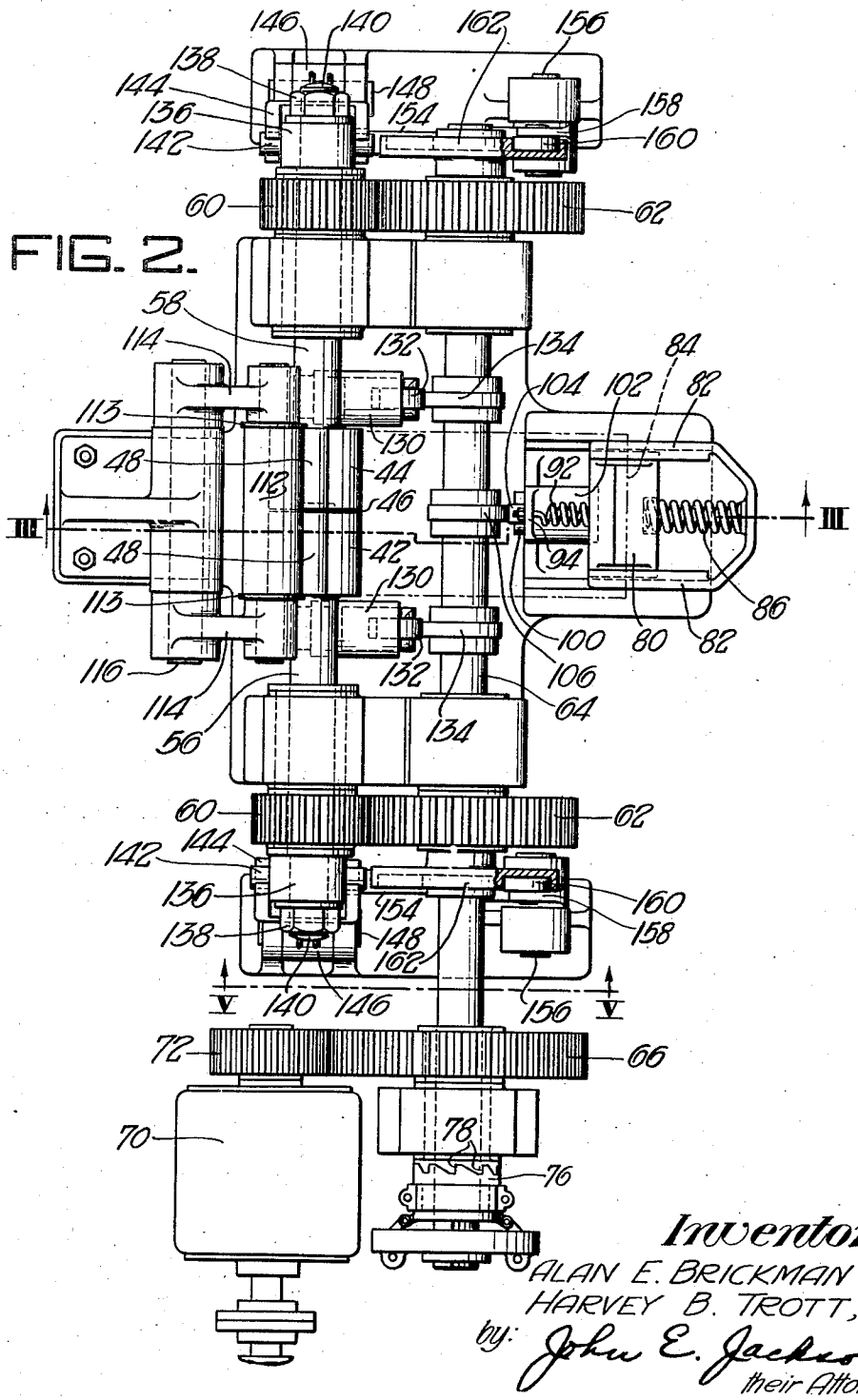
April 11, 1944. A. E. BRICKMAN ET AL 2,346,468

MACHINE FOR FORMING RESILIENT BRACKETS

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FIG. 2.



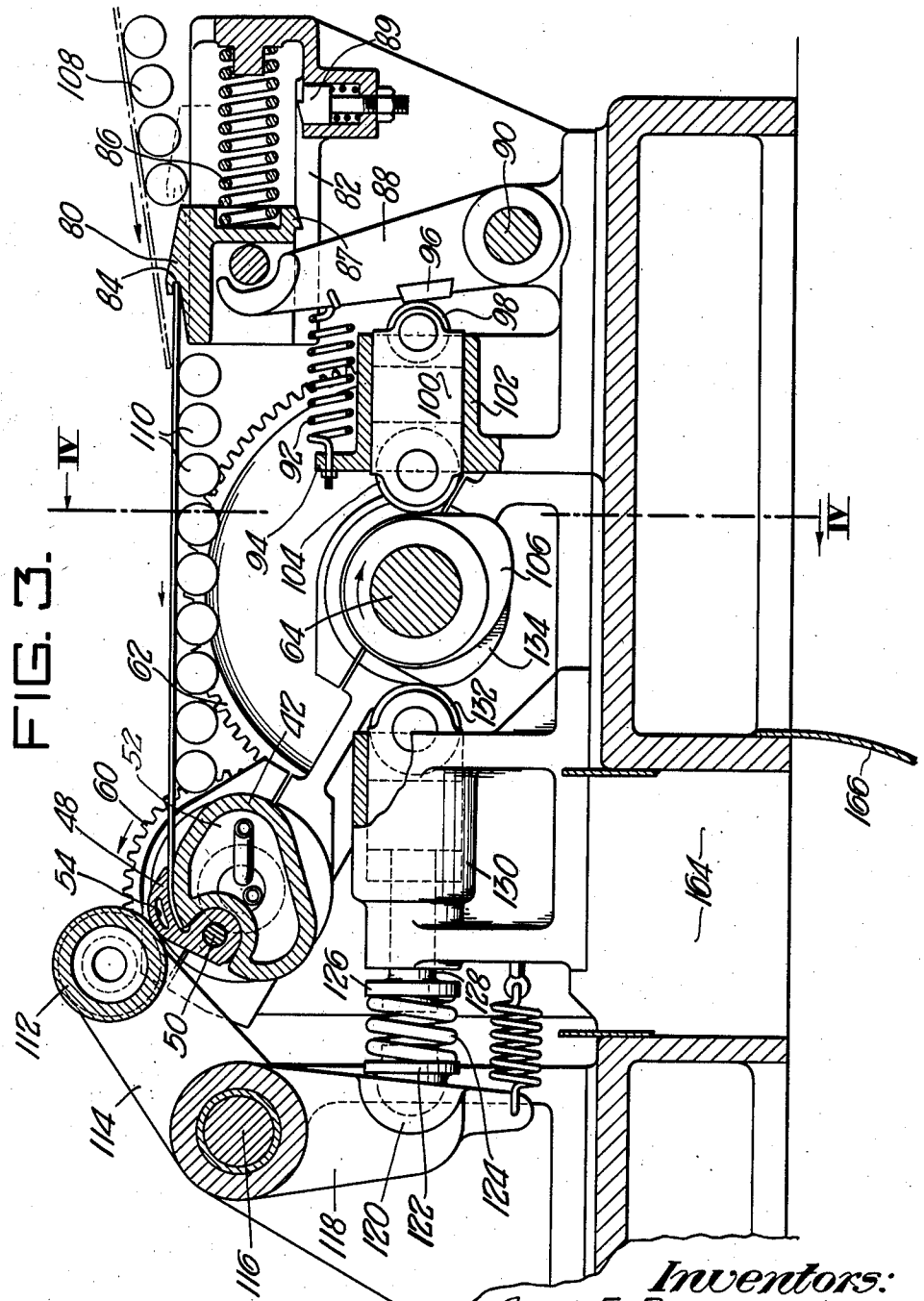
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MACHINE FOR FORMING RESILIENT BRACKETS

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FIG. 3.



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MACHINE FOR FORMING RESILIENT BRACKETS

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FIG. 5.

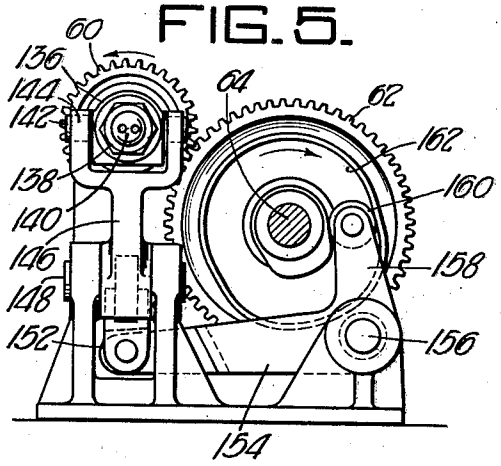
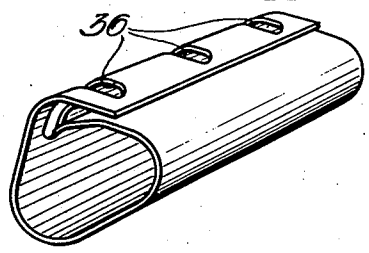


FIG. 8.



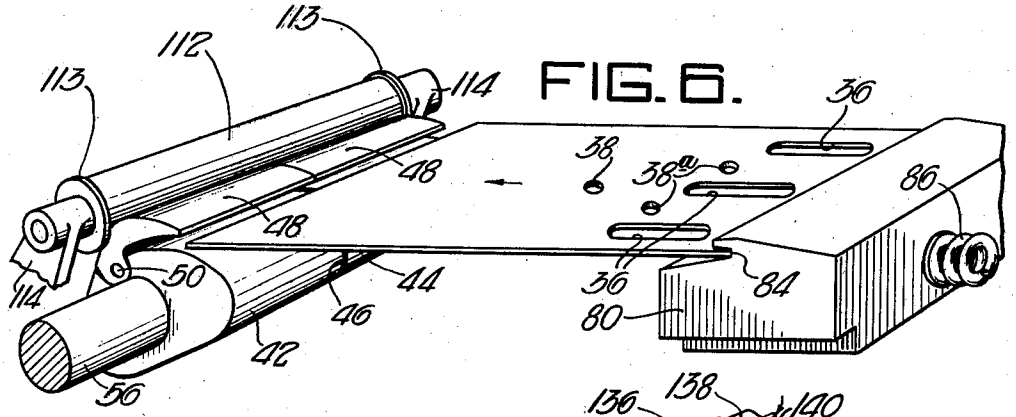
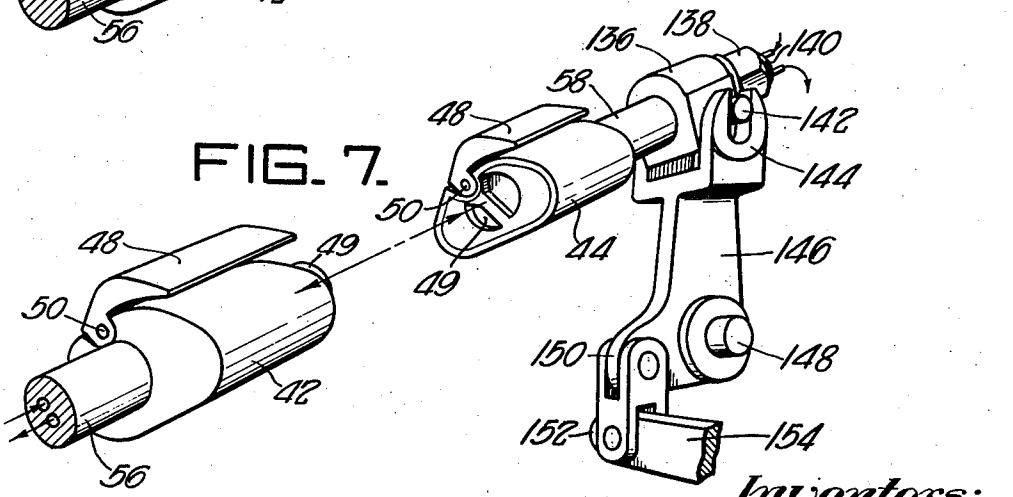


FIG. 6.

FIG. 7.



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Patented Apr. 11, 1944

2,346,468

UNITED STATES PATENT OFFICE

2,346,468

MACHINE FOR FORMING RESILIENT BRACKETS

Alan E. Brickman, Monongahela, and Harvey B. Trott, Donora, Pa., assignors to The American Steel and Wire Company of New Jersey, a corporation of New Jersey

Application April 22, 1942, Serial No. 440,084

7 Claims. (Cl. 153—40)

The present invention relates to improvements in mechanisms for rapidly yet effectively forming resilient brackets such as used to support highway guard cables.

The features of improvement constituting the invention will be fully apparent from consideration of the following detailed disclosure, the accompanying drawings and the appended claims.

In the drawings:

Figure 1 is a somewhat diagrammatic plan view of a portion of a plant specifically designed for the production of resilient brackets;

Figure 2 is a plan view of a machine embodying the present invention;

Figure 3 is a section on line III—III of Figure 2;

Figure 4 is a section on line IV—IV of Figure 3;

Figure 5 is a sectional elevation taken on line V—V of Figure 2;

Figure 6 is a perspective skeleton view showing certain of the main operating parts of the mechanism shown in Figures 2 to 5, inclusive;

Figure 7 is a detail view in perspective showing the forming mandrel of the machine in separated condition; and

Figure 8 is a detail perspective illustrating the type of resilient bracket which the machine of the present invention is designed to produce.

Referring first to Figure 1, the numeral 10 represents a stock pile of flat plate-like material from which the brackets such as shown in Figure 8 are adapted to be manufactured on a high speed production basis. From the stock pile an elongated blank of metal, such as indicated at 12, is fed to a gravity roller conveyor 14 and is propelled through a heating furnace 16 by conventional pinch rolls 18 and 20 operatively connected together by a chain 22 driven through a ratchet drive 24 suitably connected by means of gearing 26 and gear reducer 28 to a motor 30. The motor 30 through gearing 32 actuates a shear 34 which cuts up the long strip into blanks of a suitable length for the formation of the spring to be manufactured.

In a manner forming no part of the invention claimed herein, suitable slots 36 and holes 38 are formed in the blank. The slots in the completed brackets receive and slidingly support highway guard cables, the holes 38 being adapted to receive bolts which secure the bracket to a suitable supporting post, and the holes 38a accommodate reflector buttons adapted to visually indicate the presence of the brackets at night. The formation of these slots and holes takes place in the interval of time that the blanks pass from the furnace 16 to the shear 34. Thereafter the slotted and perforated blank plates are fed through a heating furnace 40 which raises the temperature of the blank to condition it for the mechanical forming operation effected by the improved machine embodying the features of the present invention.

As will hereinafter more fully appear, the improved machine includes a longitudinally separable forming mandrel of non-circular cross section equipped with a clamping jaw for gripping the forward end of the blank. This mandrel rotates and coacts with a pressure roll so mounted that it can be very forcibly but yieldingly pressed toward the work on the mandrel. Means are provided for receiving the heated blanks as they come from the furnace and for feeding them into the bite of the jaws on the rotating mandrel. Upon engagement of the blank by the mandrel, the operator trips a one-revolution clutch. This causes two complete revolutions of the mandrel, which in coaction with the pressure roller forms the heated blank into a substantially triangular bracket with ends overlapping as shown in Figure 8, whereupon the two main sections of the mandrel are separated longitudinally to the positions shown in Figure 7 to thus strip the formed bracket therefrom and discharge it by gravity into a chute leading to a suitable storage bin.

The mandrel is formed of two separable parts 42 and 44, being divided symmetrically at the center line 46. As shown in Figures 3 and 6, the mandrel is of non-circular form in cross section, resembling a triangle with rounded corners. Each mandrel section 42 and 44 carries a respective gripping jaw 48 which is pivotally mounted on a trunnion pin 50 suitably journaled in the body of the mandrel. Each of the mandrel sections is chambered as indicated at 52 to facilitate the circulation of a cooling medium therethrough which enters each mandrel section by one pipe 53 and discharges through another pipe 55. Each jaw 48 is also apertured, as indicated at 54, to facilitate cooling. End interlocking elements 49 prevent the sections 42 and 44 from misalignment.

Shaft extensions 56 and 58 are provided on the mandrel sections. Each of these extensions carries a respective gear 60 which meshes with a respective gear 62 mounted on the main shaft 64 of the machine. The main shaft 64 has loosely mounted thereon a gear 66 which is constantly driven from a motor 68 (Figure 1) through gear reducer 70 and pinion 72. A one-revolution

means for separating the sections of the mandrel so as to release the resulting article therefrom.

2. A machine for forming resilient brackets comprising a mandrel whose sectional contour corresponds substantially to a triangle with rounded corners and which is formed of longitudinally separable parts, each part having a blank gripping jaw pivotally mounted thereon, a pressure roller for coaction with blanks gripped by said jaws, a pivotally mounted support for said pressure roller, means for transmitting a yielding pressure on the said blank through said support comprising a spring, a cam and a slidable plunger actuated by said cam and coacting with said spring, a lever against which said spring reacts operatively connected to said pivotal support, and means for periodically separating the mandrel sections so as to free the formed blank therefrom.

3. A machine for forming resilient brackets from sheet-like blanks comprising a mandrel whose sectional contour corresponds substantially to a triangle with rounded corners and which is formed of longitudinally separable parts, a respective gripping element on each of said parts, means for feeding sheet-like blanks into engagement with said gripping elements, a pressure roller, an arm pivotally supporting the roller, a lever for rocking said arm, a cam, a plunger actuated thereby, a spring interposed between the plunger and the lever whereby the cam transmits spring pressures of varying magnitudes to the blank through said pressure roller during the coiling of the blank around said mandrel, and means for periodically separating the mandrel sections so as to free the formed blank therefrom.

4. A machine for forming resilient brackets comprising a rotary mandrel whose sectional contour corresponds substantially to a triangle with rounded corners, a gripper jaw mounted to rotate with the mandrel, a pressure roller for coaction with a blank on the mandrel engaged by said jaw, a movable mounting for said pressure roller, a power driven member for transmitting motion to said mounting, and a cushion element interposed between said member and said mounting whereby the roller is yieldingly urged against the blank in a manner to automatically compensate for the triangular cross sectional contour of the mandrel.

5. A machine for forming resilient brackets from plate-like blanks comprising a mandrel including longitudinally separable parts, a gripper carried by each part of the mandrel, means for feeding a blank into position to be engaged by said grippers, a pressure roller for coaction with blanks held on the mandrel by said grippers, means for rotating the mandrel and a blank gripped thereby whereby the latter is coiled about the mandrel and made to conform substantially to the shape thereof by pressure exerted by said roller, means for separating the sections of the mandrel so as to release the formed blank therefrom, an arm carrying said pressure roller, a shaft pivotally supporting said arm, means for actuating said shaft, a cam tending to forcibly urge the pressure roller toward the mandrel, and a reciprocating member and a spring interposed between the cam and said lever.

6. In a machine for forming resilient brackets from sheet-like blanks, a rotary mandrel whose sectional contour corresponds substantially to a triangle with rounded corners, a gripping jaw pivotally secured thereto, means for periodically rotating said mandrel, a pivotally mounted pressure roller coacting with the mandrel so as to conform the blanks to the shape of the mandrel upon rotation of the latter, means including a cam, a device driven thereby and a heavy spring for resiliently urging the pressure roller into engagement with the blank on the mandrel, and means synchronized with the rotation of the mandrel for sequentially feeding one sheet-like blank into position to be engaged by said gripping jaw for each two complete rotations of the mandrel.

7. A machine for forming resilient brackets from sheet-like blanks comprising a rotary non-circular mandrel, the cross sectional contour of which corresponds approximately to a triangle with rounded corners, a gripper rotating with and pivotally mounted on the mandrel, a spring actuated means for periodically feeding sheet-like blanks into engagement with the gripper, a power driven member controlling the action of said spring actuated means, a pressure roller, a movable mounting for the same, a cam, a plunger actuated by said cam, a spring coacting with the plunger and with the movable mounting so as to compensate for the non-circular contour of the mandrel during rotation thereof and to permit of the exertion of spring pressures of varying magnitudes on the blank as the mandrel is rotated.

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April 11, 1944. F. Y. CARTER 2,346,469

REFRIGERATING SYSTEM

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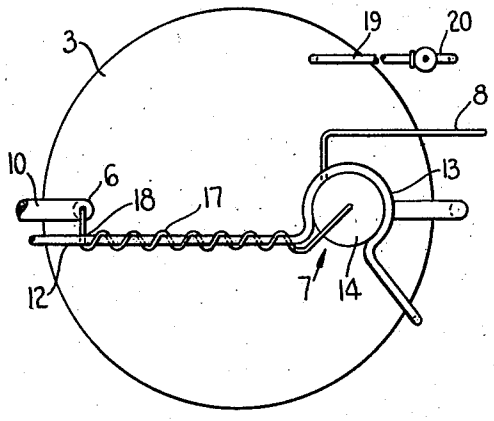


FIG-1

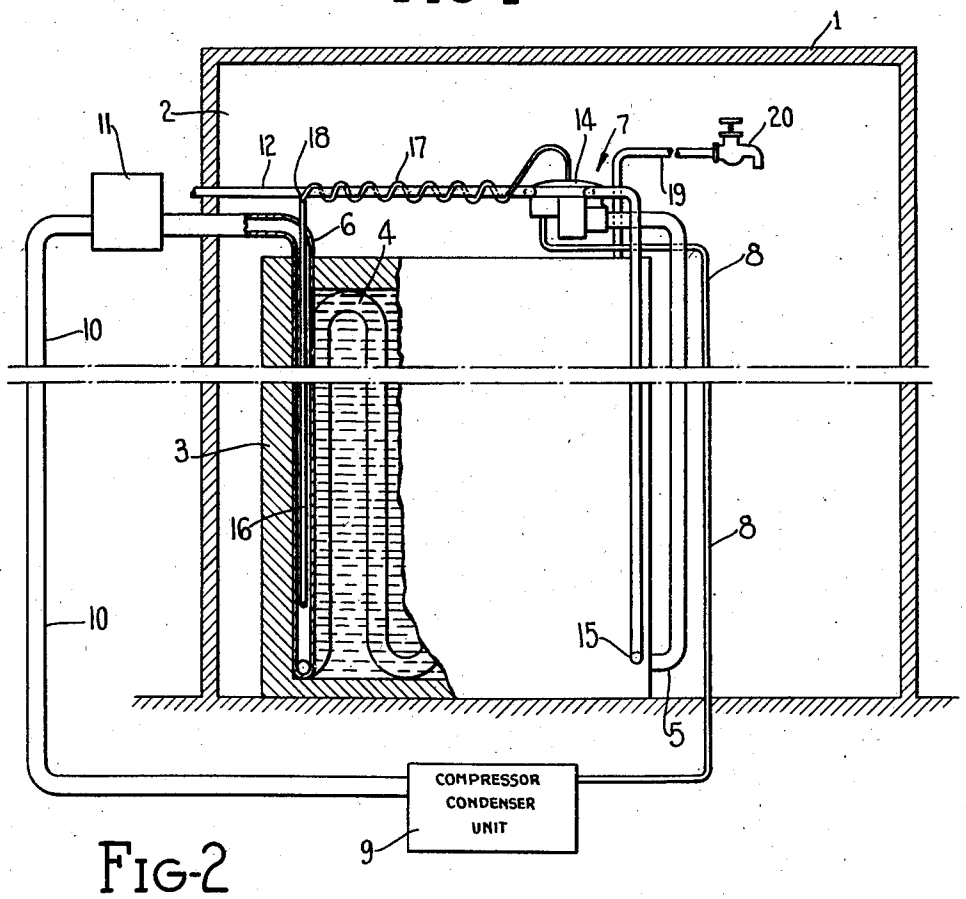


FIG-2

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