G. W. EMRICK.

MACHINE FOR MAKING ARMORED CABLE AND THE LIKE.

APPLICATION FILED MAY 15, 1917.

1,284,625.

Patented Nov. 12, 1918.

5 SHEETS—SHEET 1.

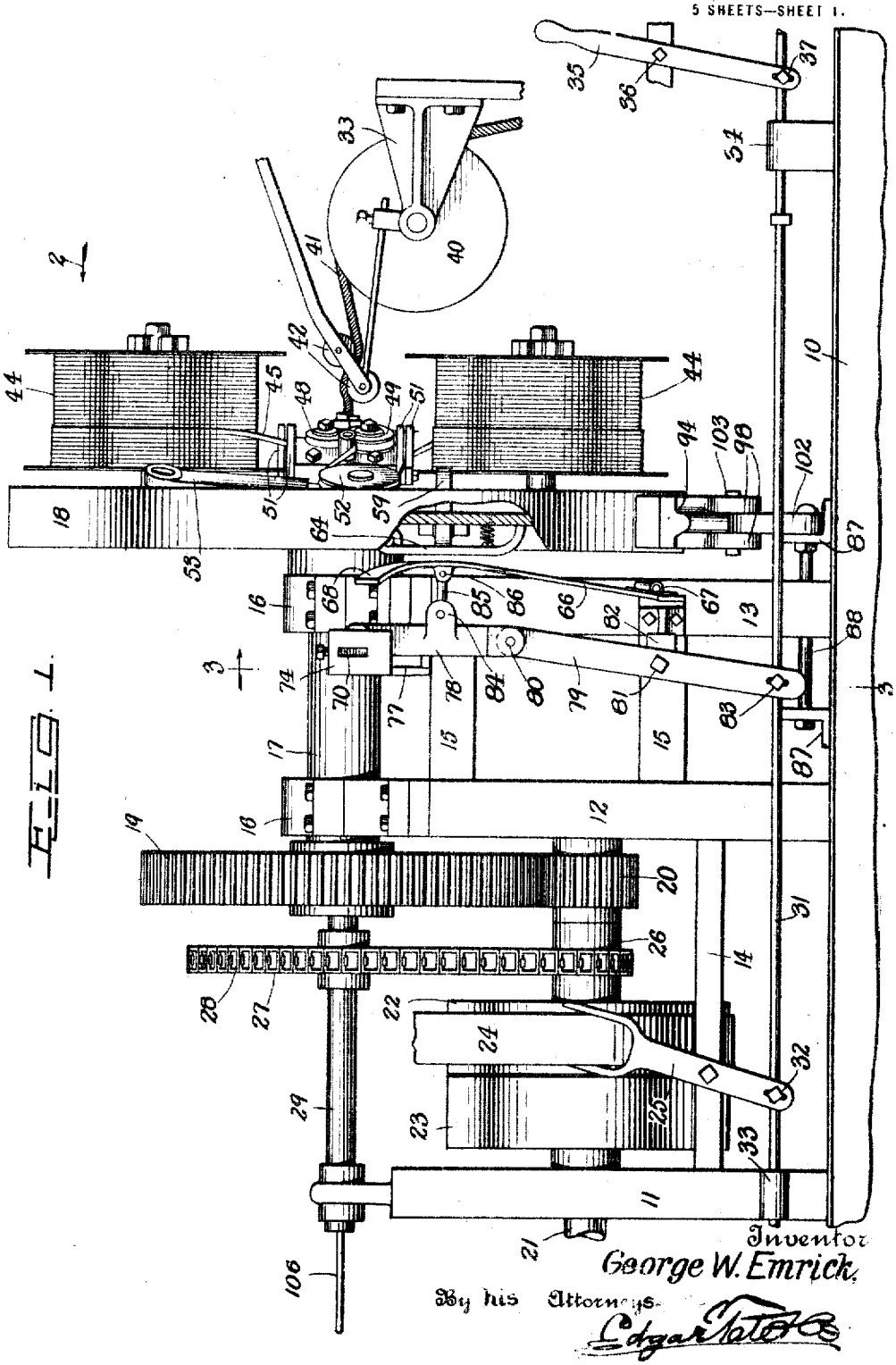


FIG. 1.

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5 SHEETS—SHEET 2.

FIG. 2.

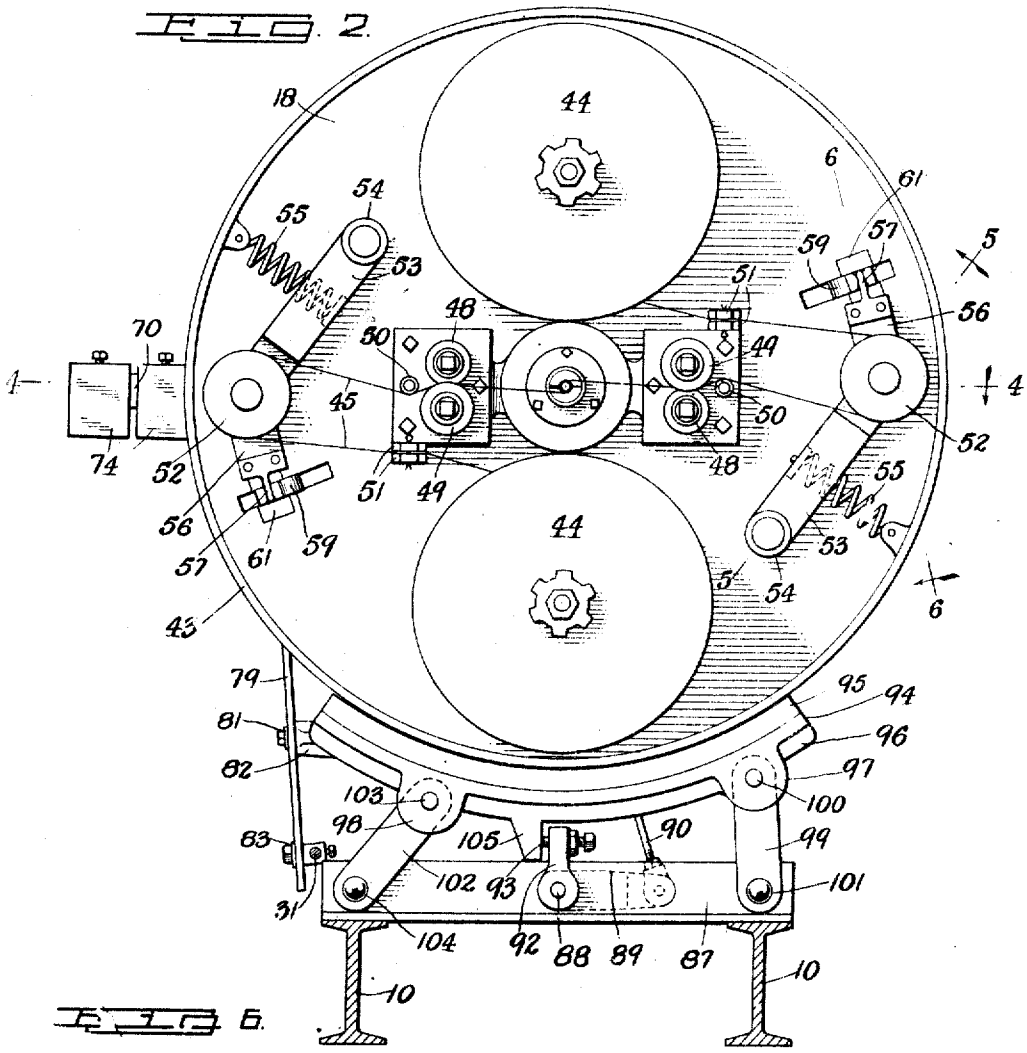


FIG. 6.

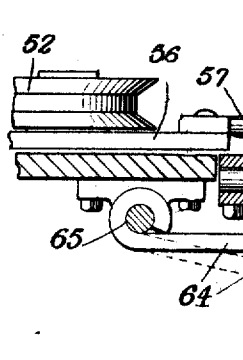
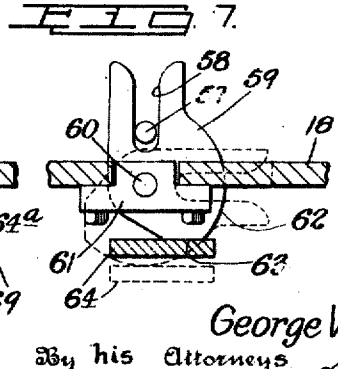


FIG. 7.



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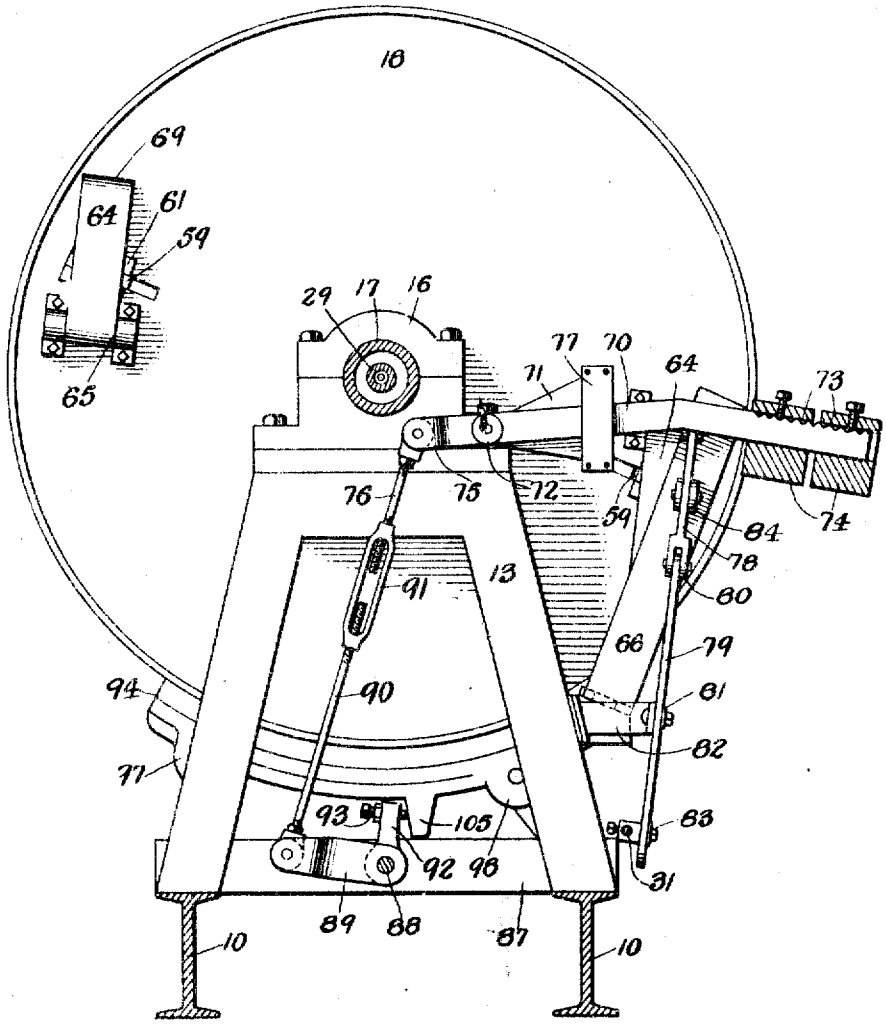
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5 SHEETS—SHEET 3.

FIG. 3.



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5 SHEETS—SHEET 4.

FIG. 4.

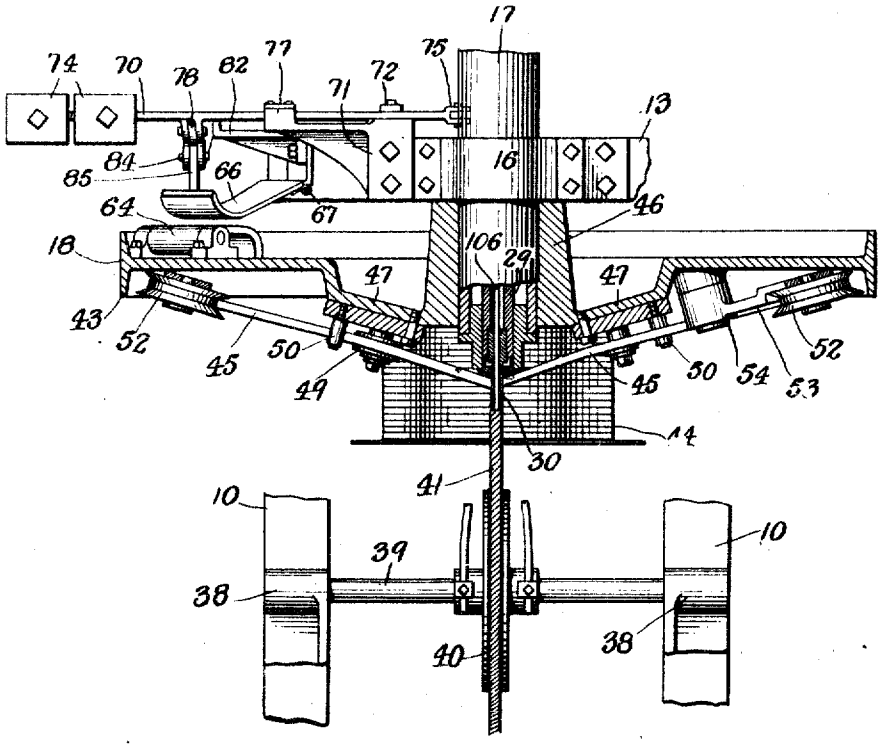
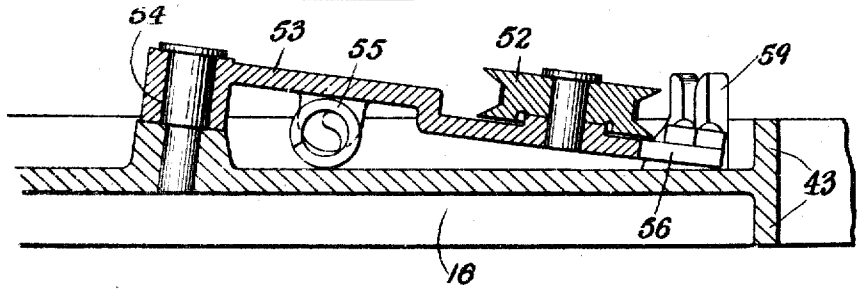


FIG. 5.



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5 SHEETS—SHEET 5.

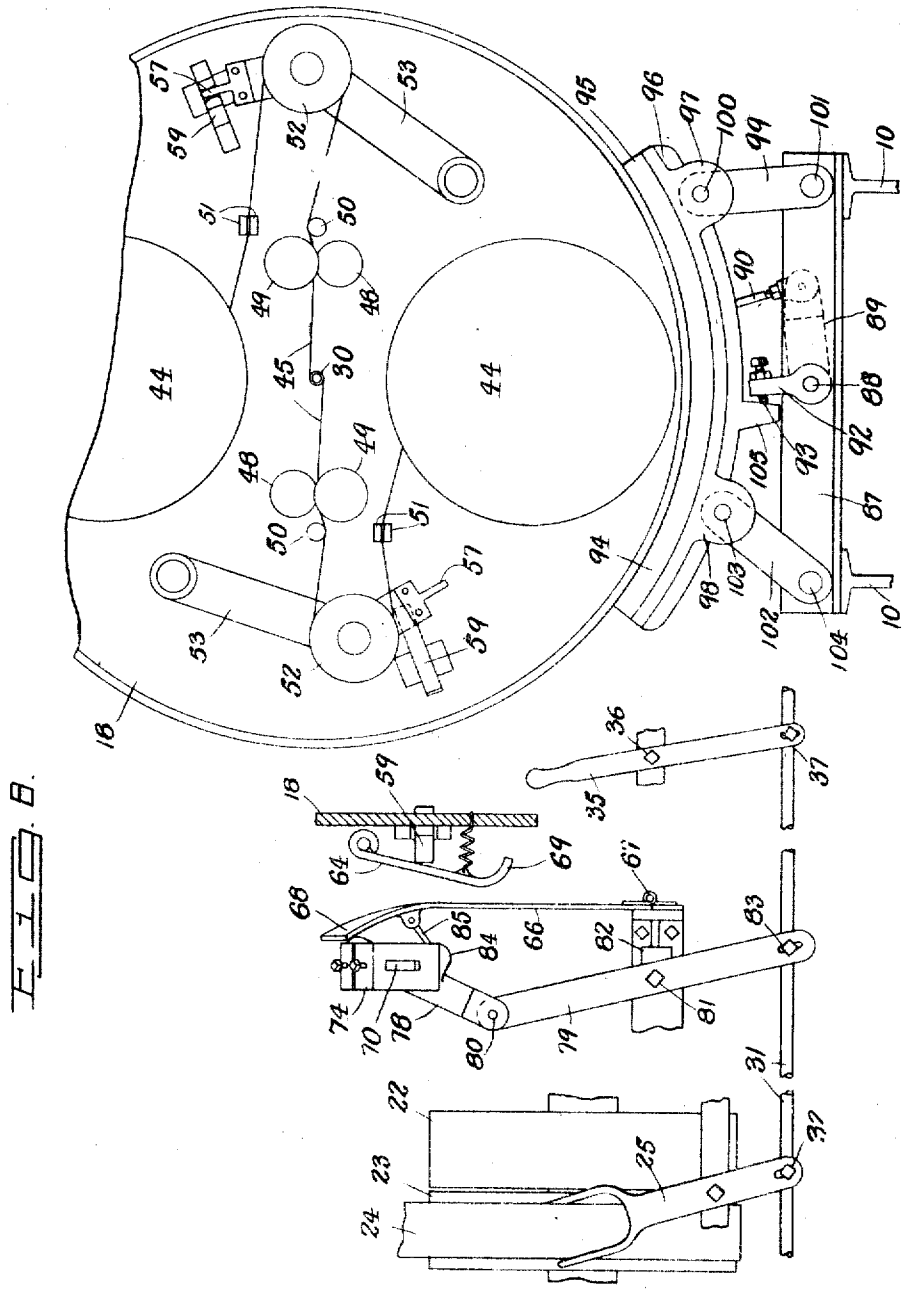


FIG. 8.

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UNITED STATES PATENT OFFICE.

GEORGE W. EMRICK, OF BROOKLYN, NEW YORK, ASSIGNOR TO EASTERN FLEXIBLE CONDUIT COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

MACHINE FOR MAKING ARMORED CABLE AND THE LIKE.

1,284,625. Specification of Letters Patent. Patented Nov. 12, 1918.

Application filed May 15, 1917. Serial No. 168,706

To all whom it may concern:

Be it known that I, GEORGE W. EMRICK, a citizen of the United States, and residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Making Armored Cable and the like, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to machines for making armored cables and what is commonly known as flexible metallic conduits for cables, and the object of the invention is to make the operation of such machines more practical, efficient and economical, and the invention described and claimed herein relates particularly to the provision of an automatic stop device for machines of the class and for the purpose specified, and the object of which is to automatically stop the machine, in the event of the twisting or snarling of the material employed, to prevent the breaking of such material when twisted or snarled, which commonly occurs in the operation of machines of the class specified, and which breakage causes considerable waste in the production and by reason of which considerable time and labor is also required in order to again start the machine after such break.

My improved automatic stop for machines of the class specified will, in the event of a twist or snarl in the material employed, be automatically operated to disengage the means for driving the machine and will actuate devices to apply a brake to the rotary member usually employed in machines of the class specified, and said machine or the rotary member thereof will be stopped in time to prevent the breaking of the material twisted or snarled as above set out, and by unsnarling the twist or snarl, which operation takes but a few minutes, the machine may be again put into operation by means of the lever usually employed for this purpose.

The various details of my improvement will be fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Figure 1 is a side view of a machine of the class specified and showing my improvement applied thereto, and showing part of the construction broken away and in section;

Fig. 2 a view looking in the direction of the arrow 2 of Fig. 1;

Fig. 3 a partial section on the line 3—3 of Fig. 1 and showing parts in a different position;

Fig. 4 a partial section on the line 4—4 of Fig. 2;

Fig. 5 a partial section on the line 5—5 of Fig. 2 and on an enlarged scale;

Fig. 6 a partial section on the line 6—6 of Fig. 2;

Fig. 7 a partial section on the line 7—7 of Fig. 6; and,

Fig. 8 a diagrammatic view illustrating the operation of my improvement.

In the drawing I have shown that part of a machine of the class specified in connection with which my improved automatic stop device operates, said machine being mounted on base frame members 10 with which are connected vertical frame members 11, 12 and 13, the frame members 11 and 12 being connected by horizontal members 14, and the frame members 12 and 13 by similar members 15. Mounted on the top of the frame members 12 and 13 are bearings 16 in which are rotatably mounted a tubular shaft 17 one end portion of which is provided with an annular rotary member 18 secured thereto in any desired manner, and the other end portion of said shaft is provided with a gear 19 which meshes with the pinion 20 on a shaft 21 mounted in the frame members 11 and 12.

Secured to the shaft 21 is a pulley 22 and a similar pulley 23 is rotatably mounted on said shaft, and a belt 24 is adapted to operate in connection with the pulleys 22 and 23 to drive the machine in the usual manner and the usual belt shift lever 25 is pivoted to the frame member 14 in the usual manner. Secured to the shaft 21 between the pinion 20 and pulley 22 is a sprocket wheel 26 in connection with which a chain 27 operates, which also operates in connection with a larger sprocket wheel 28.

The sprocket wheel 28 is mounted on one end portion of a mandrel 29 which passes through the tubular shaft 17 and through the rotary member 18, and the other end portion thereof is provided with a tubular extension 30. The construction and operation of the mandrel is the same as that usually employed in machines of the class specified and for this reason further description of the details thereof will not be given.

The belt shift 25 is pivoted to a longitudinally movable rod 31 as shown at 32. The rod 31 is mounted in suitable bearings 33 and 34, and an operating lever 35 pivoted to a suitable frame member as shown at 36 is pivotally connected with the rod 31 as shown at 37. The lever 35, the rod 31 and the belt shift 25 and the various parts connected therewith and in connection with which said parts operate is the same as that usually employed in connection with machines of the class specified.

In Figs. 1 and 4 of the drawing, I have indicated at 38 brackets supported by the framework of the machine and in which are mounted a shaft 39 with the central portion of which is connected a grooved wheel 40 around which the formed product 41 passes, and from this grooved wheel said product passes out through the machine in the usual manner. In Fig. 1, 42 indicates the sizing rollers usually employed in machines of the class specified, the function of which is to grip the formed product 41 and prevent the twisting of the same in the operation of the mandrel as well as to compress said product to equalize the outer diameter thereof.

The rotary member 18 in the construction shown is in the form of a fly-wheel, the periphery of which is enlarged or flanged as shown at 43, and rotatably mounted on one face of said fly-wheel or rotary member are the usual metal carrying spools or reels 44, two of which are shown, and on which is wound metal 45, in strip or ribbon form. The face of the fly-wheel is provided on opposite sides of the hub portion 46 thereof, and at right angles to the spools or reels 44, with beveled portions 47 on which are mounted plates adapted to support rotary die members 48 and 49 of the usual or any preferred form of construction and guide rollers 50 are also mounted on said plates. The rotary die members 48 and 49 operate to suitably shape or fashion the strip of metal 45 as it passes therebetween in the usual manner.

Connected with the beveled portions 47 and the plates mounted thereon are spaced arms 51 between which the metal 45 from the spools or reels 44 passes, said arms being adapted to straighten the metal as it passes therebetween, as hereinafter described. The various parts of the machine indicated by the numerals 10 to 51 inclusive are of the form and construction usually employed in machines of the class specified and form no part of my invention with the exception of the rotary member which, in the construction shown, is in the form of a fly-wheel, and it will be understood that my improved automatic stop device hereinafter described is adapted for use in connection with any machine of the class and for the purpose specified.

The metal 45 after it passes through the arms 51 is passed around grooved rollers 52 rotatably mounted on the end portion of arms 53 pivoted to the fly-wheel at 54 and springs 55 are connected with said arms, and with said fly-wheel, and serve to hold said arms in the positions shown in Fig. 2. The arms 53 are provided with extensions 56 with which are connected fingers 57 adapted to operate in elongated slots 58 of cam members 59 rotatably mounted on shafts 60 mounted in bearings 61 connected with the fly-wheel 18.

The cam members 59 are provided with arc-shaped faces 62 and with flat faces 63, and in Figs. 6 and 7 of the drawing the details of one of the cam members 59 and the parts connected therewith and operating in connection therewith are clearly shown, it being understood that the other cam member and parts are precisely the same.

The cam members 59, or the faces 62 and 63 thereof, are adapted to operate in connection with arms 64 pivoted to the opposite side of the fly-wheel 18 as shown at 65 and springs 64^a are connected with said arms and said fly-wheel, and normally serve to hold the arms in the position shown in Fig. 6. The arms 64 when in the dotted line position shown in Fig. 6, and in the full line position shown in Fig. 8, are adapted to operate in connection with a similar but longer arm 66 hinged or pivoted to the frame member 13 as shown at 67, and the free end portion of the arm 66 is curved as shown at 68, and the arms 64, or the free end portions thereof, are also curved as shown at 69, whereby when either of the arms 64 strikes the arms 66 the same will freely pass thereover as will be readily understood.

A lever 70 is pivotally connected with a bracket 71 connected with the top portion of the frame member 13 at one side of the machine as shown at 72. One end portion of said lever is provided in the top face thereof with a plurality of teeth or projections 73 and weights 74 are adapted to be adjustably mounted on said end portion as clearly shown in Fig. 3, and the other end portion of said lever is forked as shown at 75 in Fig. 4, and a rod 76 is pivoted in said forked end portion.

The bracket 71 is provided with an enlarged head portion 77 through which the

first named end portion of the lever 70 passes, and pivoted centrally of said end portion of the lever is a link member 78, the free end portion of which is pivotally connected with one end portion of a lever 79 as shown at 80, said lever 79 being pivoted at 81 to a bracket 82 secured to the frame member 13, as clearly shown in Figs. 1 and 3, and the other end portion of the lever 79 is pivotally connected with the rod 31 as shown at 83. The link member 78 is provided centrally thereof with ears 84 with which is pivotally connected a link 85, which is also pivotally connected with the arm 66 as shown at 86.

Secured to the bottom frame members 10 on the opposite sides of the frame member 13 are angle-iron members 87 centrally of which is mounted a shaft 88 on one end portion of which is mounted an arm 89, and in the end of which is pivoted a rod 90 which is connected with the rod 76 by means of a turnbuckle 91, as clearly shown in Fig. 3. The other end portion of the shaft 88 is provided with an arm 92 in the end portion of which is adjustably mounted a bolt or screw 93.

A brake member 94 is mounted to operate in connection with the bottom portion of the fly-wheel and comprises a face portion 95, preferably composed of fibrous material, and an arc-shaped back portion 96, the opposite end portions of which are provided with ears 97 and 98. A link 99 is pivoted to the ears 97 as shown at 100, and to one of the angle-iron members 87 as shown at 101, and another link 102 is pivoted to the ears 98 at 103 and to said angle-iron member 87 as shown at 104 and, as will be noted, the links 99 and 102 are adapted to aid in supporting the brake member 94, as clearly shown in Fig. 2.

Centrally of the back portion 96 of the brake member 94 is a downwardly directed member 105 in connection with which the screw or bolt 93 operates as hereinafter described.

The operation of my improvement will be readily understood by all those skilled in the art, on a careful consideration of the drawing, in view of the foregoing specification, and the following statement. The method of starting the machine, which includes the threading of the metal 45 from the spools or reels 44 between the rollers 51 and then between the rotary die members 48 and 49 and onto the mandrel is accomplished in the usual manner, and in the operation of the machine said metal is wound onto an insulated wire cable 106 as indicated in Fig. 4, after which the wound cable passes through the sizing rollers 42 and over and around the grooved wheel 40, and out through the machine in the usual manner.

In the practice of my invention the metal 45 after it passes between the arms 51 is passed around the grooved rollers 52 connected with the arms 53 and then passes between the die members 48 and 49, and when the machine is in operation the various parts of my improvement will assume the position shown in Figs. 1, 2 and 4 and the full line position in Figs. 6 and 8.

Should the metal become snarled in one of the spools or reels 44 the unreeling of the metal from said spool or reel is prevented, in which operation the grooved roller 52 over which the metal snarled or held against unreeling passes is moved inwardly or radially into a position approximately similar to that shown at the left side of the fly-wheel as shown in Fig. 8. In the above operation of the roller 52, the arm 53 is swung on its pivot 54 against the tension spring 55 and the finger 57 secured to the free end of the arm 53 operates to move the cam member 59 into the position shown in dotted lines in Fig. 7 which operation moves the arm 64 into the position indicated in dotted lines in Figs. 6 and 7 and in full lines in Fig. 8.

The movement of the arm 64 into the dotted line position shown in Fig. 6 and into the full line position shown in Fig. 8, will bring the same in the path of the arm 66 in the rotation of the rotary member or fly-wheel 18, and when said arm 64 reaches the position shown in Fig. 8 the arm 66 will be moved into the position shown in Fig. 8 by the arm 64 striking the same.

The movement of the arm 66 caused by the arm 64 striking the same moves the link 78 into position to bring the pivotal connection of said link with the lever 79 beyond a dead center, after which the lever 70 will move from the position shown in Figs. 1 and 2 into the position shown in Figs. 3 and 8 by reason of the weights 74 at one end portion of said lever 70.

The above movement of the lever 70 into the position shown in Fig. 3 will move the arm 89 upwardly into the position shown in Figs. 3 and 8 by reason of the connection of said arm with the lever 70 through the rods 76, 90 and turnbuckle 91. The upward movement of the arm 89 oscillates the shaft 88 which operation correspondingly moves the arm 92, which will move the brake member 94 into operative connection with the face or flange portion 43 of the fly-wheel 18 as shown in Figs. 3 and 8 by reason of the screw or bolt 93 engaging the projecting member 105.

The above operation of applying or moving the brake member 94 into operative position by reason of the movement of the arm 53 or grooved roller 52 mounted thereon over which the snarled metal passes also operates to move the belt 24 from the pulley 22 which is secured to the shaft 21 onto the pulley 23 which is rotatably mounted thereon, or

into the position shown in Fig. 8, this operation being accomplished by reason of the connection of the lever 79 with the rod 31 as will be readily understood.

The above operation of shutting off the power and applying the brake member 94 will stop the rotary member or fly-wheel 18 within two or three revolutions after the snarling occurs, and in this way the breaking of the snarled metal is prevented as will be readily understood, and when the snarl is straightened out, the machine is again put in operation by simply manipulating the lever 35 to move the rod 31 with the belt shift 25 and lever 79 connected therewith into the position shown in Fig. 1 in which operation the finger 57 on the end of the arm 53, previously moved into the position shown in Fig. 8 is again returned into the position shown in Fig. 2, or within the elongated slot 58 in the cam member 59, and the brake member 94 is again moved into its inoperative position as shown in Fig. 2, as will be readily understood.

Having fully described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. An automatic stop device for machines of the class described, comprising a rotary member, means for rotating said member, a brake device for stopping the rotation of said member, means on said rotary member for supporting the material employed, a movable member mounted on said rotary member and in connection with which the material employed operates, and devices in operative connection with the movable member and the brake device whereby excess tension caused by the twisting or snarling of said material will operate the movable member to actuate said devices to stop the means for rotating said rotary member.

2. An automatic stop device for machines of the class described, comprising a rotary member, means for rotating said member, a brake device for stopping the rotation of said member, means on said rotary member for supporting the material employed, a movable member mounted on said rotary member and in connection with which the material employed operates, and devices in operative connection with the movable member and the brake device whereby excess tension caused by the twisting or snarling of said material will operate the movable member to actuate said devices to move the brake member into operative position and stop the means for rotating said rotary member.

3. In a machine of the class described, a rotary member, means for rotating said member, a brake device for stopping the rotation of said member, means on said rotary member for supporting the material employed, means movably mounted on said rotary member in connection with which the material employed operates, and devices in operative connection with said last named means and said brake device whereby excess tension caused by the twisting or snarling of said material will operate said last named means to actuate said devices to move said brake device into operative position.

4. In a machine of the class described, a rotary member, means for rotating said member, a brake device for stopping the rotation of said member, means on said rotary member for supporting the material employed, means movably mounted on said rotary member in connection with which the material employed operates, and devices in operative connection with said last named means and said brake device whereby excess tension caused by the twisting or snarling of said material will operate said last named means to actuate said devices to move said brake device into operative position and stop the means for rotating the rotary member.

5. The combination with a machine of the class described, comprising a rotary member, a mandrel, means for operating said rotary member and means for operating said mandrel, and metal carrying members mounted on said rotary member, of a stop device comprising movable members mounted on said rotary member and in connection with which the metal from each of said carrying members operates, a brake device adapted to operate in connection with said rotary member, and devices in operative connection with the movable members and with the brake device whereby excess tension caused by the twisting or snarling of said metal will operate a movable member to actuate said devices to move said brake device into operative position.

6. The combination with a machine of the class described, comprising a rotary member, a mandrel, means for operating said rotary member and means for operating said mandrel, metal carrying members mounted on said rotary member, of a stop device comprising movable members mounted on said rotary member and in connection with which the metal from each of said carrying members operates, a brake device adapted to operate in connection with said rotary member, and devices in operative connection with the movable members and with the brake member whereby excess tension caused by the twisting or snarling of said metal will operate a movable member to actuate said devices to move said brake device into operative position and stop the means for operating said rotary member and said mandrel.

7. The combination with a machine of the class described, comprising a rotary member, a mandrel, and means mounted on said rotary member for supporting the material employed, of a stop device comprising a

brake member adapted to operate in connection with said rotary member, a tensionally controlled member mounted on said rotary member and in connection with which said material operates, means movably mounted on said rotary member adapted to be operated by said tensionally controlled member, and devices in operative connection with said brake member and said last named means whereby excess tension caused by the twisting or snarling of said material will operate said tensionally controlled member to actuate said last named means to move the brake member into operative position.

8. The combination with a machine of the class described, comprising a rotary member, a mandrel, means for rotating said member and means for rotating said mandrel, and means mounted on said rotary member for supporting the material employed, of a stop device comprising a brake member adapted to operate in connection with said rotary member, a tensionally controlled member mounted on said rotary member and in connection with which said material operates, means movably mounted on said rotary member adapted to be operated by said tensionally controlled member, and devices in operative connection with said brake member and said last named means whereby excess tension caused by the twisting or snarling of said material will operate said tensionally controlled member to actuate said last named means to move the brake member into operative position and stop the means for rotating said rotary member and said mandrel.

9. In a machine of the class described, the combination with a rotary member and the means for controlling the rotation of said member of a brake device for said rotary member, means movably mounted on said rotary member in connection with which the material employed operates, and devices in operative connection with said last named means, said brake device and said first named means whereby excess tension caused by the twisting or snarling of said material will operate the last named means to actuate said devices to move the brake device into operative position and to operate the first named means to stop the rotation of said rotary member.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 12th day of May 1917.

GEORGE W. EMRICK.

Witnesses:

C. E. MULREANY,

H. E. THOMPSON.,