Dec. 9, 1952 M. LARCINESE 2,620,995

WIRE RETAINING DEVICE

Filed June 8, 1948

Fig. 1

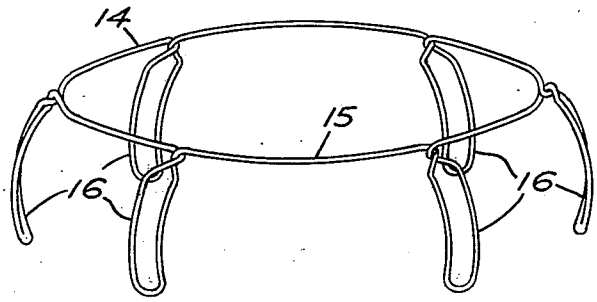


Fig. 2

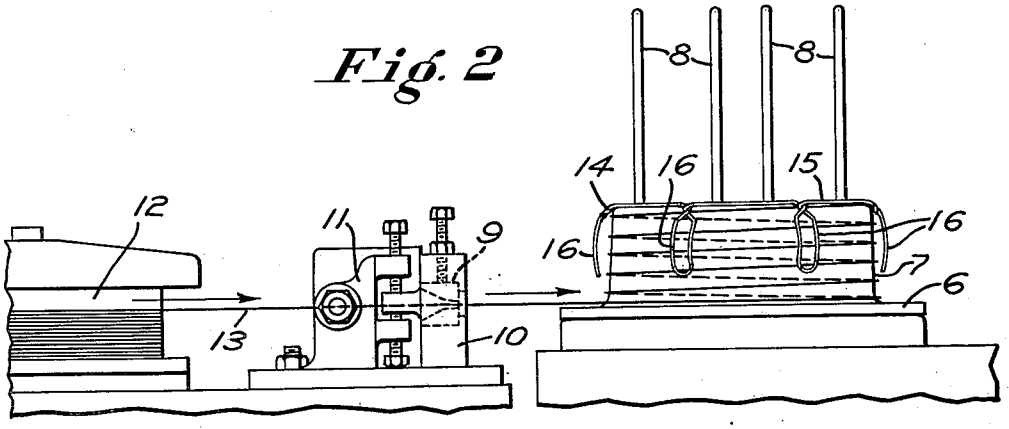


Fig. 3

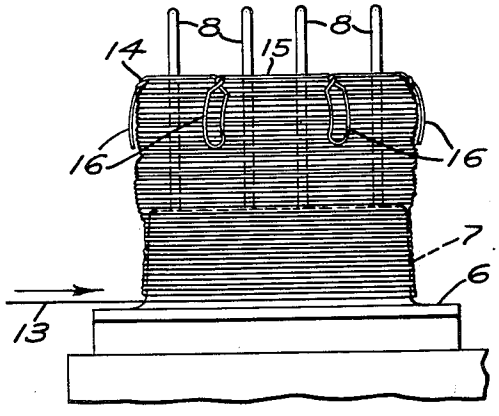
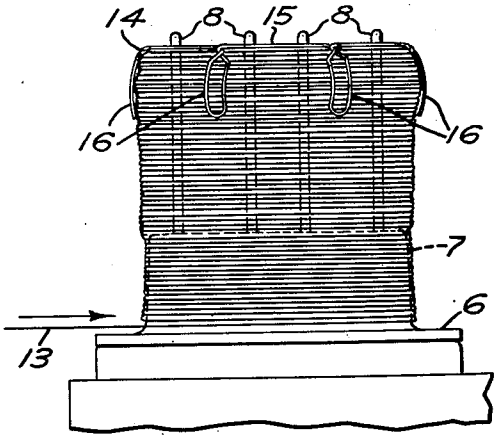


Fig. 4



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Patented Dec. 9, 1952

2,620,995

UNITED STATES PATENT OFFICE

2,620,995

WIRE RETAINING DEVICE

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Application June 8, 1948, Serial No. 31,630

5 Claims. (Cl. 242—78)

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This invention relates to a device for use in connection with wire drawing apparatus, and its object is to produce a relatively light weight, simple structure which is particularly adapted to cooperate with the block of a high speed wire drawing machine in holding the strands or coils of wire in place thereon during wire drawing operations.

A further object is to produce a coil-engaging device which is adapted for use on the block of a wire drawing apparatus, and which functions as a safety device in holding the separate strands of wire in place on the block during wire drawing operations.

A further object is to produce a device of the character described, in the form of an integral structure which is adapted to cooperate with the rapidly rotating block of wire drawing apparatus during wire drawing operations; to engage the strands of wire wound onto the block during such operations; to ride upwardly with the coils or strands of wire as they move upwardly along the block extension pins as the bundle of wire on the blocks increases in size; and which overlaps a plurality of such strands under conditions such as to prevent the strands spreading during wire drawing operations in case the forward end of the wire being drawn is disengaged from the block during such operations.

These and other objects which will be made more apparent throughout the further description of my invention, are obtained by means of a device such as is illustrated in the accompanying drawings.

In the drawings, Figure 1 is a perspective view of a coil-engaging device embodying my invention. Figure 2 is a fragmental side elevation of a portion of a wire drawing apparatus and illustrates an embodiment of my invention in place on the wire drawing block forming a part of such apparatus. Figure 3 is a side elevation of the wire drawing block shown in Figure 2 and illustrates the block and the extension pins thereof partially filled with wire coils and shows an embodiment of my invention in position on the uppermost of such coils. Figure 4 is a view corresponding to Figure 3 and shows the position of the device of my invention as the wire drawing operation is being completed.

Referring to the drawings: the block is of usual form and includes a substantially horizontal flange 6 which is formed integrally with a tapered upright portion 7, and is provided with four block extension pins 8. The wire drawings die 9 is more or less diagrammatically shown as mounted in

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a die support 10 which is adjustably and pivotally secured to a die holder 11. A spool 12 is illustrated as associated with the wire drawing apparatus and as forming a support for a coil of wire 13 to be drawn.

As a preliminary to a wire drawing operation, the wire 13 is passed through the wire drawing aperture formed in the die 9, and after being coiled around the portion 7 of the block the forward end thereof is secured to the block by a vice or any other suitable mechanism. During the wire drawing operation the block is rotated so as to wind the wire 13 thereon as it issues from the die 9. In Figure 2 the block as shown has several loops or strands of wire extending around the part 7 thereof and the arrows associated with Figure 2 indicate the direction of movement of the wire 13 as it is pulled through the die 9 and wound onto the block 7. The block is of usual form and as illustrated is provided with four extension pins 8 which are equally spaced with relation to the periphery of the block but are set inwardly of the block with relation to the face of the tapered portion 7 thereof.

Where a wire drawing block forms a part of the wire drawing apparatus it is usual to employ a weighted disk for holding the wire in place on the block. Such disks are heavy, are annular in form, encircle the extension pins of the block and engage the uppermost strands of the bundle of wire on the block, riding upwardly along the extension pins of the block as the wire coiled onto the block builds up around such pins. It will be understood by those familiar with wire drawing operations, that such weighted disks must be moved frequently by the operators during wire drawing operations; that they rotate with the blocks and, therefore, are a source of danger, particularly where high speed blocks are involved, since if dislodged during the rotation of the blocks they may be thrown for some distance. The device of my invention takes the place of these weighted disks and is so formed and constructed that it overcomes difficulties encountered where such disks are employed, and it also obviates the possibility of injury in case a wire drawing block is over filled or other conditions are encountered such as would result in dislodging such a weighted disk during the rotation of the associated wire drawing block.

In Figure 2 a wire coil-engaging device embodying my invention, is shown in place on the block and is designated by the reference character 14 in all the figures of the drawings.

As clearly shown in Figure 1, the device of my

invention consists of an annular portion or member 15 to which coil-confining or coil-engaging means 16 are secured. In the illustrated embodiment, the coil-engaging means are shown as fingers which are secured to and equally spaced around the member 15. All the fingers 16 project laterally from one side of the member 15 and each extends at a divergent angle to the axis of the circle surrounded by the member 15 and is curved so that the outer end thereof is closer to such axis than the intermediate portion of the finger.

In the illustrated embodiment, the member 15 and the coil-engaging means 16 are shown as part of a unitary structure. This structure may be formed of a single piece of relatively heavy wire which is looped and twisted to form the fingers 16 and which is extended between such loops or fingers so as to form the annular member 15. It will, of course, be understood that the member 15 and the fingers 16 may be separately formed and then secured together in any suitable manner, such for example as by welding. The member 15 and the fingers carried thereby must, however, provide a light, but at the same time a rigid and relatively rugged structure, i. e., a structure which will hold its shape under conditions of rough usage such as are likely to be encountered in a wire drawing shop.

In Figure 2 the member 15 is shown as seated on the upper face of the block and as surrounding the extension pins 8. In this position the fingers 16 project downwardly and overlap the tapered portion 7 of the block and consequently the strands of wire which encircle that portion of the block. During the wire drawing operation the strands of wire formed at the base of the block are forced upwardly by the on-coming wire. As a result, the strands encircling the portion 7 of the block are first crowded together and eventually the uppermost of such strands are moved upwardly off of the tapered portion 7 and surround the pins 8. As the strands of wire are crowded together on the portion 7 of the block they move upwardly under the depending fingers 16 of the coil-engaging device 14. As the uppermost strands move off of the portion 7 of the block they lift the device 14 with the result that the circular member 15 thereof seats on the uppermost strand or strands of the bundle and the device moves upwardly along the pins 8 as the wire drawing operation continues and the bundle of wire on the block increases in size. During such movement the device 14 is held in place by the cooperation between the member 15 and the pins 8, and the depending fingers 16 overlap a substantial portion of the bundle below the uppermost strands.

From the foregoing it is apparent that the device 14, while riding on the uppermost strands of the bundle of wire performs a double function in that it holds the uppermost strands in place on the bundle as the bundle increases in size during the drawing operation, and it prevents spread of the strands in case the forward end of the wire becomes disengaged from the block. It also tends to remain in place on the bundle if, by accident or intent, the block is overfilled during a wire drawing operation, and even to the extent that the top strands of the bundle move to a position adjacent the upper ends of the pins 8 or even rise slightly above the upper ends of such pins. The depending fingers 15 contribute to these results by engaging a substantial portion of the coil or bundle of wire on the block. This is clearly disclosed in Figures 3 and 4 of the drawings. In both figures the fingers engage a substantial number of strands near the top of the coil or bundle, consequently the cooperation between such strands and the fingers tends to hold the device 14 in place on the bundle under the varying conditions (occasioned by accident or otherwise) which may arise during wire drawing operations.

It will be apparent to those familiar with wire drawing operations that the devices 14 perform the function of the weighted disks sometimes employed in association with the wire drawing blocks during wire drawing operations. It will also be apparent that the structural features of the device 14, including its relatively light construction overcome difficulties and dangers encountered where weighted disks are employed. During wire drawing operations it is necessary to handle the wire holding disks frequently. For this reason the weight thereof is objectionable. Then too, a condition may arise such that a weighted disk is thrown from a rapidly rotating block, thus increasing the hazards accompanying wire drawing operations. On the other hand, wire-engaging devices embodying my invention are relatively light in weight and, as noted above, their structural details are such as to prevent them from being accidentally dislodged from the wire drawing blocks, with which they are associated, during wire drawing operations.

Those familiar with high speed wire drawing operations will realize the necessity of preventing strand spread and also preventing a length of wire from freeing itself from the bundle during the high speed rotation of the block. If for any reason the wire of the bundle is capable of responding to the centrifugal force occasion by the high speed rotation of the block, strand spread will result. Unless the block is surrounded by guards the whipping action of the rapidly moving wire thus disengaged from the block or the extension pins thereof, may cause damage to apparatus or injury to operators or attendants. Weighted disks and similar devices, heretofore employed with high speed blocks, do not prevent strand spread or the resultant freeing of a length of wire from the bundle in case the forward end of the wire being drawn becomes disengaged from the block. My invention, however, does prevent strand spread under circumstances usually encountered which result in such a condition. The depending portion of the device 14 which overlaps the upper portion of the bundle of wire on the block, confines the overlapped strands and thus prevents those strands from responding to centrifugal force if for any reason there is a tendency toward such a response. If, for example, the block is over-filled during a wire drawing operation or the forward end of the wire is disengaged from the block, the depending portion of the device 14 will prevent strand spread and, at least, give the operator time to shut down the wire drawing apparatus and thus prevent damage to the wire being drawn, to apparatus and even injury to individuals. Thus it is apparent that devices embodying my invention contribute to the safety of wire drawing operations.

While the illustrated embodiment of my invention is shown as if formed from relatively heavy wire it will, of course, be apparent that rod-like material or other material may be employed in forming the devices of my invention so long as each such device consists of a substantially annular portion for engaging the uppermost strands of a bundle of wire coiled on a wire

drawing block, and is so formed that it also overlaps a substantial portion of the bundle under conditions such as to prevent the device being dislodged from the block in case the block is overfilled during wire drawing operations.

What I claim is:

1. A wire retaining device for use with the block of a high speed wire drawing apparatus, comprising a unitary structure formed from rod-like material into a substantially annular portion interrupted at spaced points around its periphery by twisted loops projecting therefrom.

2. In combination with the block of a high speed wire drawing apparatus and the series of vertically extending pins carried thereby; a wire coil retaining device consisting of a substantially annular member movably supported on the upper surface of said block, loosely encircling said series of pins and having coil confining fingers formed integrally therewith, located in spaced relationship circumferentially thereof and extending downwardly at a divergent angle to the direction of said pins, with each such finger curved so that the free end thereof is closer to the vertical axis of said block than the intermediate portion of such finger.

3. In combination in a wire-drawing apparatus, a wire-drawing block having coil-supporting extension pins projecting at right angles from the horizontal face thereof and an annular, coil-retaining device loosely mounted on said block and loosely surrounding said pins, said device being formed of rod-like material and having depending, coil-engaging fingers secured thereto and spaced circumferentially thereof and extending from one side thereof.

4. A wire-coil-retaining device for use with the wire-drawing block of a high speed wire drawing apparatus, said device comprising an annular, coil-engaging member having coil-confining fingers secured thereto, spaced circumferentially thereof, projecting laterally from one side thereof with each such finger extending at a divergent angle to the axis of the circle confined by said member and curved so that its free end is closer to such axis than the intermediate portion thereof.

5. A high speed wire-drawing apparatus including a rotatable wire-drawing block having a series of coil-supporting extension pins arranged circumferentially of the block and projecting at right angles above the horizontal surface thereof, in combination with a coil-retaining device loosely mounted on said block and loosely surrounding said pins and comprising an annular coil-engaging member formed of rod-like material and having depending, coil-confining fingers secured thereto and spaced circumferentially therearound, with each such finger projecting laterally from one side of said member extending at a divergent angle to the axis of said block and so formed that its free end is closer to such axis than the intermediate portion thereof.

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