June 29, 1943. J. J. KAUFMANN 2,323,282

DROP WIRE FOR WARPING MACHINES AND THE LIKE

Filed Sept. 18, 1942

Fig. 1.

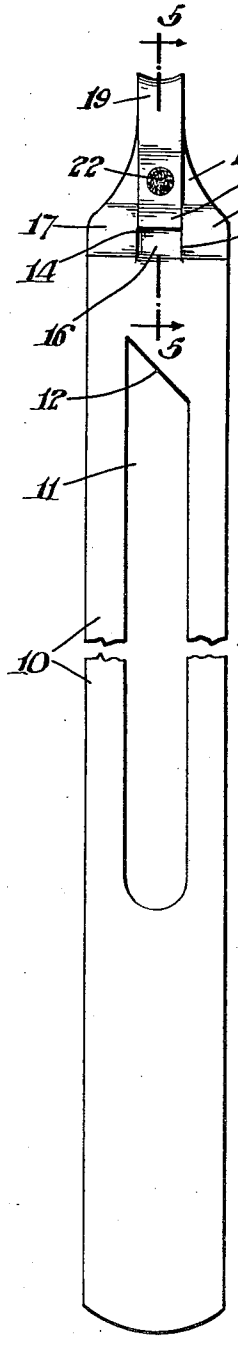


Fig. 2.

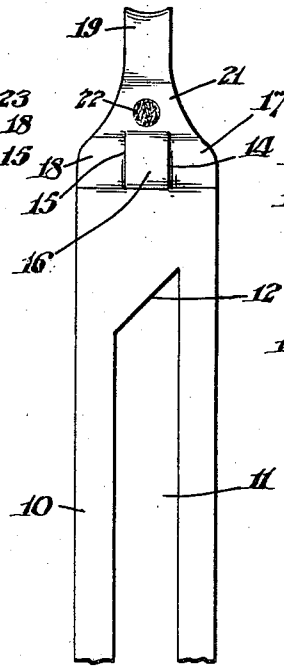


Fig. 3.

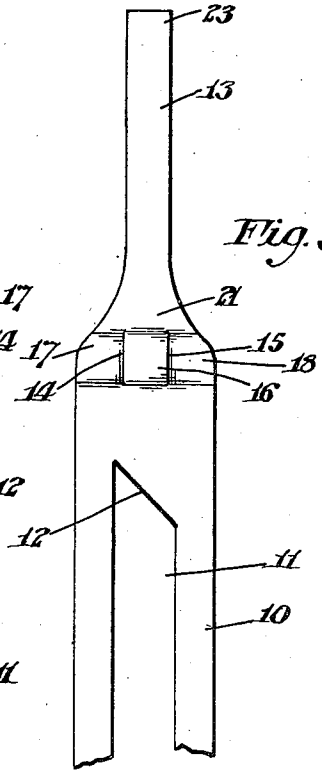


Fig. 4.

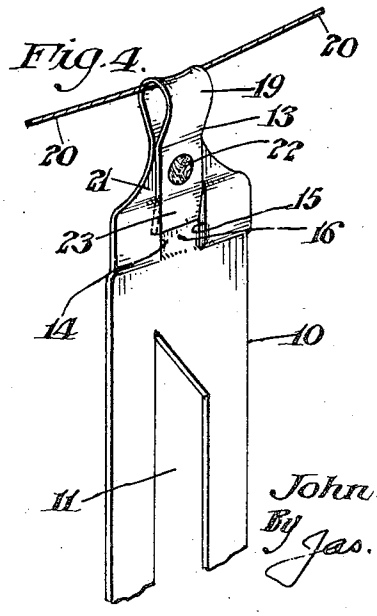
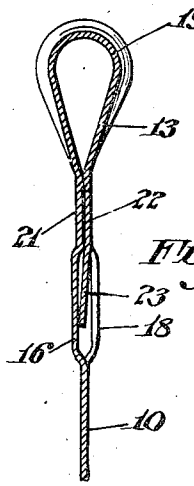


Fig. 5.



Inventor:
John Jacob Kaufmann
By Jas. C. Abbeuwith
Attorney.

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UNITED STATES PATENT OFFICE

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DROP WIRE FOR WARPING MACHINES AND THE LIKE

John Jacob Kaufmann, Elkins Park, Pa., assignor to Steel Heddle Manufacturing Company, Philadelphia, Pa., a corporation of Pennsylvania

Application September 18, 1942, Serial No. 458,760

8 Claims. (Cl. 28—50)

This invention relates to drop wires or detector elements used in stop motions of warping machines and the like. It is, of course, well known that the drop wires or detector elements used in the stop motions of warping machines and the like are in many respects similar to the drop wires used in the warp stop motions of looms. There are, however, certain differences in the problem presented in the making of a satisfactory drop wire when the same is to be used in a warping machine or in any other type of machine in which a sheet of warp is passing therethrough at a relatively high speed. It is well known that when the warp travels at a high speed through an eye in a metallic member, such as a drop wire or the like, the warp will quickly cut through the metal and thereby bring about the destruction of the member.

Recourse has been had to the use of porcelain inserts in the eyes of drop wires used in warping machines, and these proved to be reasonably satisfactory, but the same were imported mainly from certain sections of Europe which are now inaccessible on account of the prevailing war. By reason of this situation, various attempts have been made to provide a satisfactory substitute for the drop wires provided with porcelain eyes. For example, it has been suggested to reinforce the eye portions of the drop wires by means of metal grommets, but these have not proved satisfactory because if made hard enough to withstand the wear they are difficult to form and to secure in place.

The principal object of the present invention is to provide an improved form of drop wire for use in warping machines and the like, which may be inexpensively manufactured and which will serve as an effective substitute for the drop wires provided with porcelain inserts at the eye portions.

A further object of the invention is to provide a drop wire of the character aforesaid, which while made of relatively soft material is, nevertheless, so constructed and arranged as to have a relatively long period of usefulness, and which will tend to resist the wear of the warp end passing through the eye portion.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the drawing forming part hereof, in which:

Figure 1 is a side elevation, enlarged, of a drop wire for the stop motions of warping machines, said drop wire embodying the main features of the present invention;

Fig. 2 is a similar view of the upper portion thereof but looking toward the opposite face;

Fig. 3 is an elevational view of the upper portion of the drop wire shown in Fig. 1 in a preliminary stage of its manufacture;

Fig. 4 is a perspective view illustrating the upper portion of the drop wire and the manner in which the same is engaged by the warp end which passes through the eye thereof; and

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 1 illustrating certain features of the formation of the eye portion of the drop wire.

It should, of course, be understood that the description and drawing herein are illustrative merely, and that various changes and modifications may be made in the structure disclosed without departing from the spirit of the invention.

Referring to the drawing, in the particular embodiment of the invention therein shown, the drop wire is made from a thin flat strip of metal suitably punched and formed to bring the same to the desired outline and shape. The body portion of the drop wire may be of any preferred shape and may be provided with suitable slots as may be required by the particular stop motion in connection with which the drop wire is used.

As shown, the body portion 10 of the drop wire is provided with a centrally disposed slot 11 the upper end of which is defined by an inclined marginal edge 12. This type of drop wire is ordinarily used in electrically controlled stop motions as will, of course, be readily apparent to those familiar with this art.

The upper end of the drop wire is initially punched to provide an elongated tongue portion 13 below which the strip is slitted as at 14 and 15, and the metal of the strip is pressed out of the initial plane thereof, the central portion 16 between the slits 14 and 15 being pushed in one direction, and the outer portions 17 and 18 being pushed in the other direction, out of the main plane of the strip.

The tongue portion 13 is bent around to form a loop 19 which is preferably shaped somewhat similar to that of a rope grommet, that is to say, the portion of the loop 19 thus provided, which is engaged by the warp end 20, will be of a curved shape in cross-section, see Figs. 1, 2, and 4. This curvature will not ordinarily be very pronounced, and is somewhat exaggerated in the drawing for the purpose of illustration.

The part of the tongue portion 13 which extends beyond the part thereof which is used in forming the loop 19, bears against the flat por-

tion 21 of the stock above the depressed portion 16 and is spot welded as at 22, at this point to the flat portion 21 of the stock. The portion 23 of the tongue 13 which extends beyond the portion which is spot welded to the portion 21 is bent inwardly into the depression 16 hereinbefore described, thus avoiding any possibility of fouling of adjacent warp ends on the end 23 of the tongue portion 13 of the drop wire.

The tongue portion 13 is relatively wide so as to provide an extended bearing surface for the warp which passes through the eye end, thereby serving to increase the life of the drop wire.

The operation of the drop wire is the same as that of the drop wires commonly used in warping machines and the like.

By the foregoing arrangement there is provided a drop wire, for stop motions of warping machines and the like, which may be readily and quickly made in automatic machines, which drop wires are inexpensive to manufacture, and which will serve as effective substitutes for the drop wires heretofore used with porcelain inserts in the eye portions.

I claim:

1. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent around in loop formation to provide an eye through which the warp end extends, said loop portion being curved in transverse section.

2. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent around in loop formation to provide an eye through which the warp end extends, said loop portion being curved in transverse section, the body portion immediately below the eye portion being formed to provide a centrally disposed recess in which the end of the tongue portion is positioned.

3. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent around in loop formation to provide an eye through which the warp end extends, said loop portion being curved in transverse section, and the body portion immediately below the eye portion being slitted and formed to provide a centrally disposed recess in which the end of the tongue portion is positioned.

4. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent around in loop formation to provide an eye through which the warp end extends, said loop portion being curved in transverse section, the body portion immediately below the eye portion being slitted and formed to provide a centrally disposed recess in which the end of the tongue portion is positioned, and the tongue portion being permanently secured near its end to the body portion.

5. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent round in loop formation to provide an eye through which the warp end extends, said loop portion being curved in transverse section, the body portion immediately below the eye portion being slitted and formed to provide a centrally disposed recess in which the end of the tongue portion is positioned, and the tongue portion being permanently secured near its end to the body portion by spot welding.

6. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent around in loop formation to provide an eye through which the warp end extends, the body portion immediately below the eye portion being formed to provide a centrally disposed recess in which the end of the tongue portion is positioned.

7. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent around in loop formation to provide an eye through which the warp end extends, the body portion immediately below the eye portion being formed to provide a centrally disposed recess in which the end of the tongue portion is positioned, and the tongue portion being permanently secured near its end to the body portion.

8. A drop wire, for warping machines and the like, made of a thin flat strip of metal having the upper end thereof provided with a tongue portion bent around in loop formation to provide an eye through which the warp end extends, the body portion immediately below the eye portion being formed to provide a centrally disposed recess in which the end of the tongue portion is positioned, and the tongue portion being permanently secured near its end to the body portion by spot welding.

JOHN JACOB KAUFMANN.