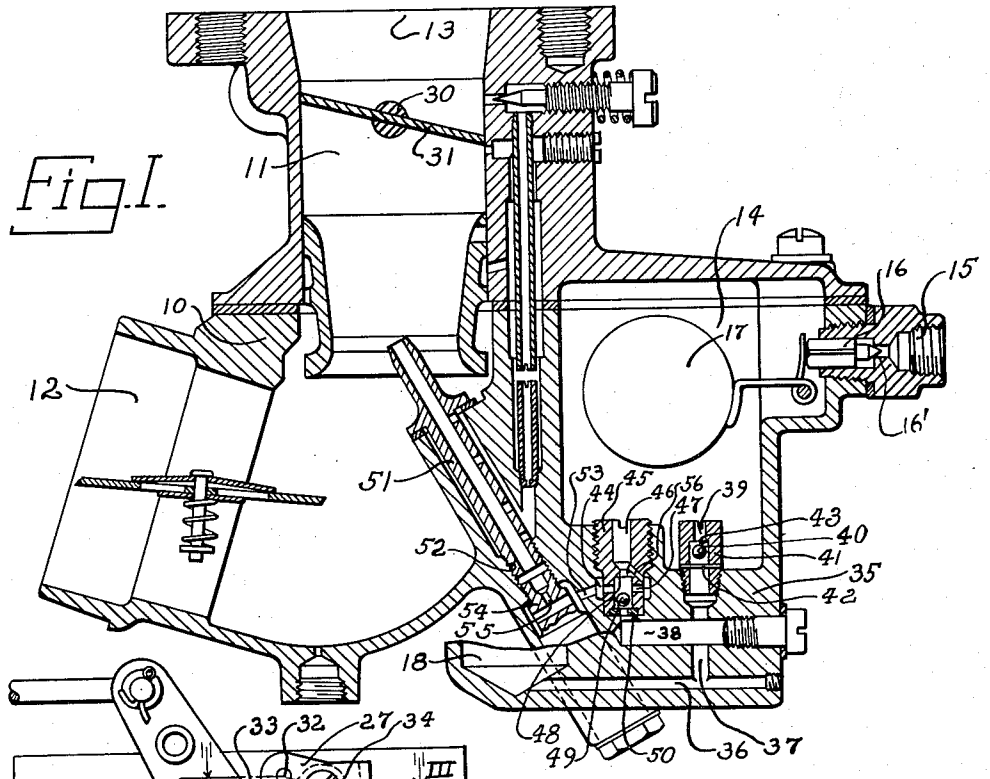
June 22, 1937. F. O. BALL ET AL 2,084,306

CARBURETOR

Filed May 31, 1932

Fig. I.



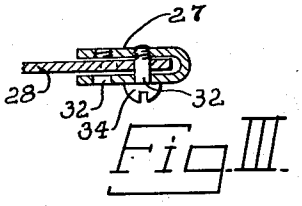


Fig. III.

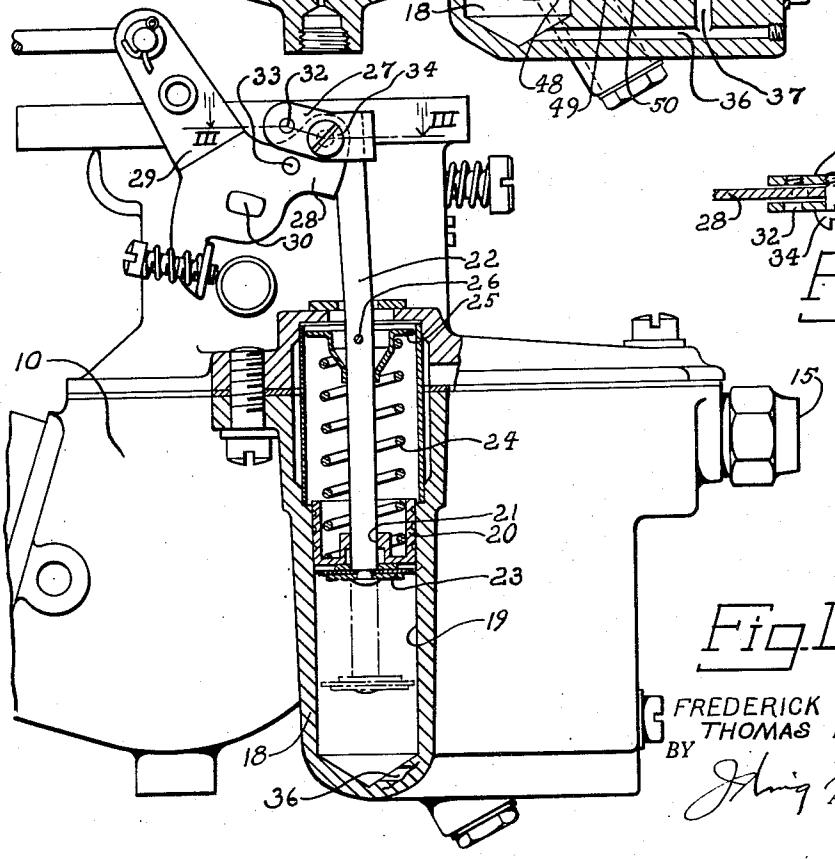


Fig. II.

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NEEDLE FOR TAKING UP DROPPED STITCHES

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Application August 6, 1936, Serial No. 94,696
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2 Claims. (Cl. 66—117)

This invention relates to a new and improved type of needle for taking up dropped stitches in knitted and stockinette work, in which a sliding member operated by the stitches of the material is movably mounted in the shaft of the needle and adapted to close and open the mouth of the hook.

In known needles of this description the sliding member is provided on the under side with a prominence projecting from the shaft of the needle, against which the stitch threads strike on the reciprocation of the needle, the sliding member being thereby arrested, and the hook mouth therefore opened and closed. To aid the advancing of the sliding member the upper stitch also bears against the upper edge of the sliding member as soon as this edge, in the course of the forward movement of the sliding member, has come clear of the needle shaft and is exposed. However, since the prominence on the under edge of the sliding member is in the immediate neighbourhood of the forward end of the sliding member, it may happen, when the pitch or angle of incidence of the needle is slight, or when the operative is lacking in skill or experience, that the upper thread fails to come up against the upper edge of the sliding member at all; moreover, the upper thread is apt to slip off the straight upper edge of the sliding member, since this thread is naturally less tensioned than the lower thread against which the needle bears in working and against which the needle is involuntarily pressed. The upper thread may consequently find its way into the hook mouth of the needle instead of being thrown clear of the hook when the needle is retracted. In this case the dropped stitch caught by the hook of the needle can not be drawn through between the two last standing stitches, so that mistakes are made in the work.

With the needle according to the invention this drawback can not arise, since on the one hand the upper thread can not slide off the sliding member into the hook of the needle, and on the other hand at all possible angles of incidence of the needle both the upper and the lower thread bear against or engage the sliding member throughout the entire forward movement of the sliding member. This result is achieved by providing the head of the sliding member at its upper edge with a projection extending beyond the upper edge of the shaft, and by providing the shaft on its under side with a flat arcuate recess which roughly corresponds in length to the extent of the forward movement of the sliding member, and which extends so far back that, even when the needle is tilted at a slight angle of incidence, the lower edge of the sliding member is exposed for engagement by the lower thread even at the very commencement of the forward movement initiated by the lower thread. In this manner the further result is also achieved that friction between the sliding member and the bottom of the shaft of the needle, which would act as a check upon the forward movement of the sliding member, is avoided effectually.

If the opening of the mouth of the hook of the needle is to be effected by means of a restoring spring known per se, the lug to which one end of the spring is attached is provided on the under side of the sliding member, and passes out through a longitudinal slot in the bottom of the shaft of the needle, with the result that the sliding member is prevented from falling out of the shaft even without the use of the usual sleeve provided on the shaft for this purpose in the types of needle hitherto known.

A form of construction embodying the invention is shown, by way of example, in the accompanying drawing, in which Figs. 1 and 2 show the forward portion of the needle according to the invention, on an enlarged scale, with the mouth of the hook in the opened and in the closed condition, respectively.

Referring to the drawing, *a* denotes the needle shaft which terminates at the forward end in the hook *b*, and which is provided throughout its length with a groove or channel in which the sliding member *c* is so mounted as to be longitudinally reciprocable therein. The front end of the sliding member is shaped to form an upwardly extending projection *d* which extends above the upper edge of the shaft even when the sliding member is retracted. The upper thread of the stitch engages this projection and initiates the closing movement of the sliding member when the needle is retracted; the upper thread is caught by the projection *d*, and it can not therefore slip off the sliding member into the hook of the needle. On the under side the shaft *a* is provided with a shallow arcuate recess *e* the length of which is approximately equal to the extent of the forward movement of the sliding member, and which extends so far back that at every possible angle of incidence of the needle the sliding member is engaged on the under side by the lower thread m_1 in the recess *e* by the time the forward movement of the sliding member is initiated by the upper thread m_2. In this manner faultless forward movement of the slid-

ing member is ensured with the avoidance of any appreciable friction capable of checking the movement of the sliding member. As can be seen from Fig. 2, the sliding member *c* remains engaged by both threads, even in the closing position, until finally the upper thread is thrown clear over the projection *d* on the sliding member and over the hook of the needle. The chain-dotted line *x—x* indicates the approximate position of the work relatively to the needle, and thus shows the angle of incidence of the latter.

The opening of the mouth of the hook of the needle is effected by the sliding member in a known manner through the instrumentality of a tension spring *f* which is attached to the end of the needle shaft which is not shown in the drawing, whereas the front end of this spring is secured to a lug *g* projecting from the lower edge of the sliding member *c* and extending to the outside through a slot *h* in the shaft of the needle. The provision of the lug *g* on the under side of the slide prevents the latter from falling out of the groove in the shaft and does away with the necessity for providing an abutment sleeve about the needle shaft.

I claim:

1. A needle for the taking up of dropped stitches in knitted and stockinette work, in which there is movable in the needle shaft a sliding member which closes and opens the mouth of the hook of the needle, characterized by the fact that the head of the sliding member is provided on its upper edge with a projection (*d*) extending above the upper edge of the shaft, and the shaft on its under side with a shallow arcuate recess (*e*) approximately equal in length to the extent of the forward movement of the sliding member and extending so far back that at all possible angles of incidence of the needle to the work the lower edge of the slide is exposed for engagement by the lower thread already at the commencement of the forward movement of the slide initiated by the upper thread coming up against the said projection (*d*).

2. A needle as claimed in claim 1, characterized by the fact that the lug on the slide to which the restoring spring is secured is provided on the under side of the slide and extends to the outside through a slot provided at the bottom of the channeled needle shaft, for the purpose of preventing the slide from falling out of the shaft without the necessity for the provision of an abutment sleeve about the shaft of the needle.

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