

May 9, 1933.

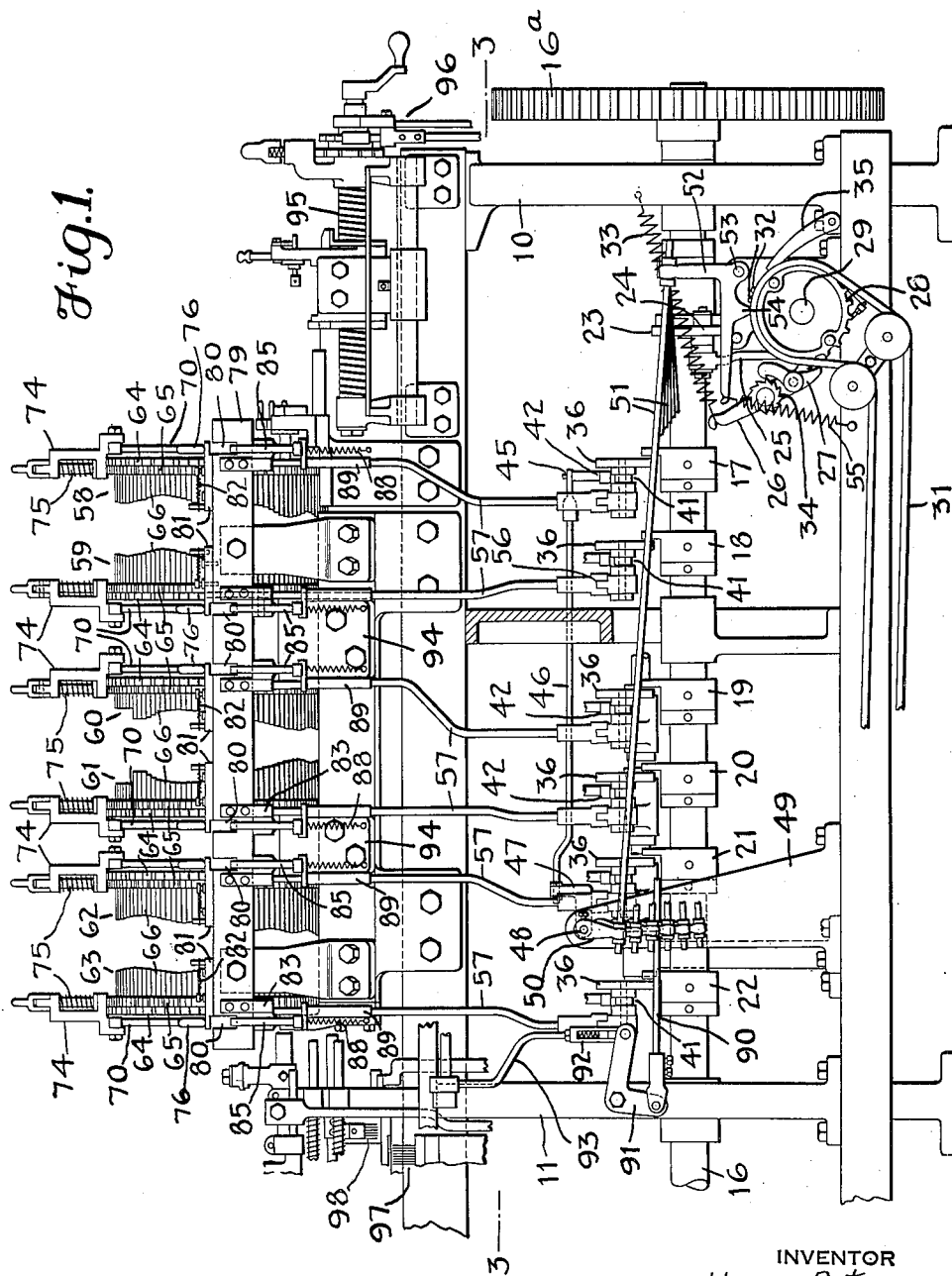
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1,908,442

KNITTING MACHINERY

Filed Dec. 3, 1931

6 Sheets-Sheet 1



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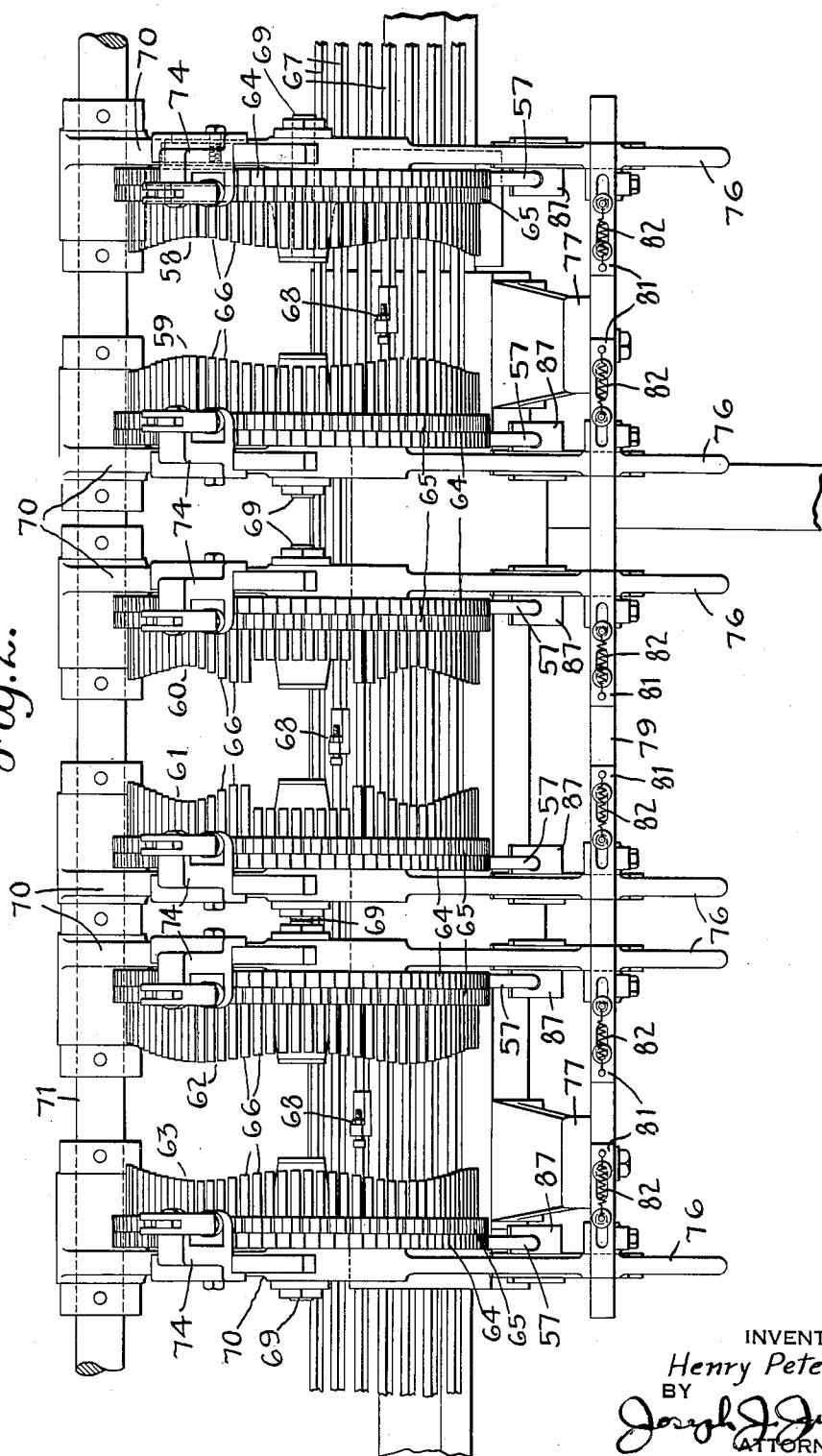
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Fig. 2.



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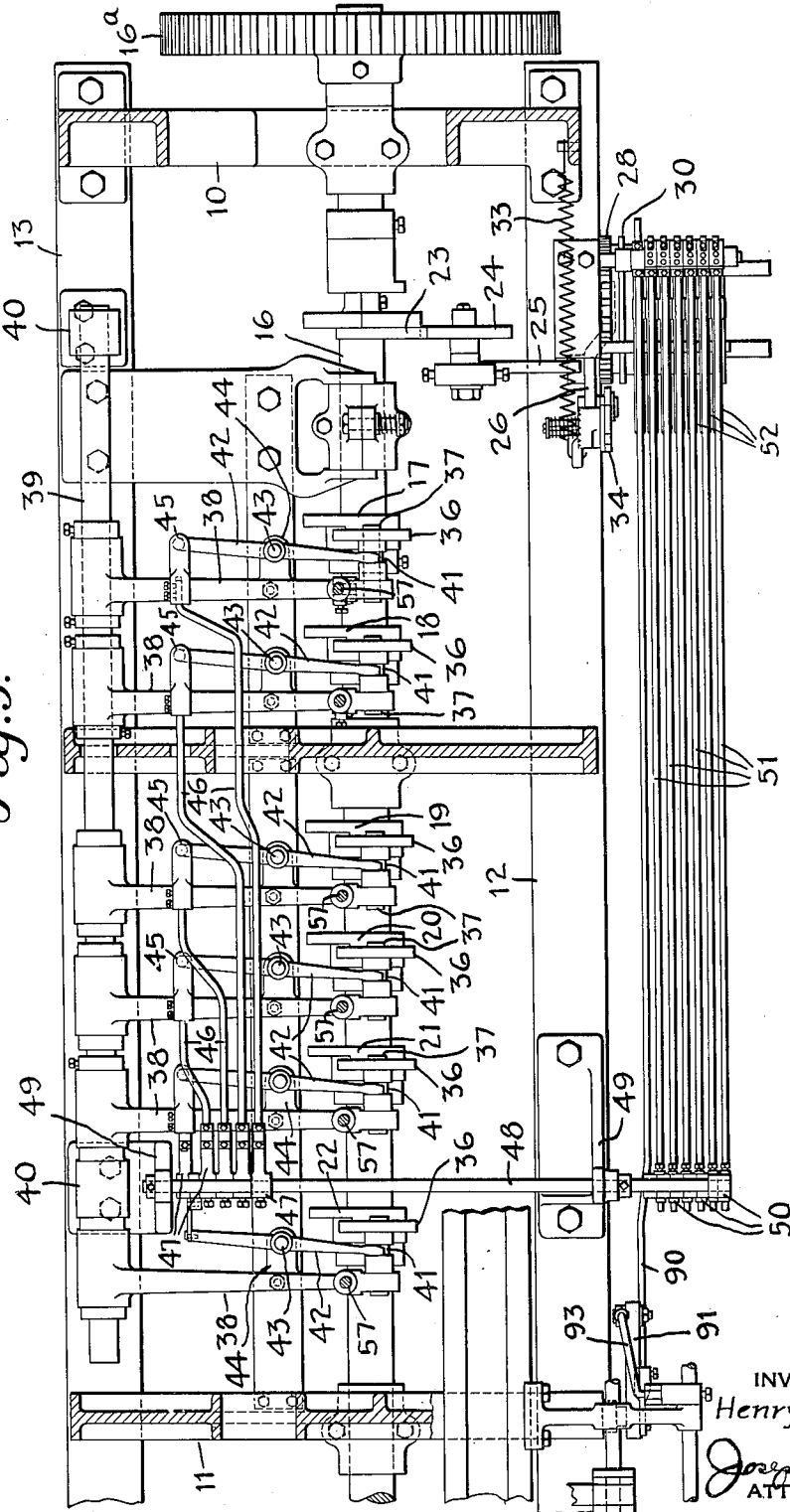
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Fig. 3.



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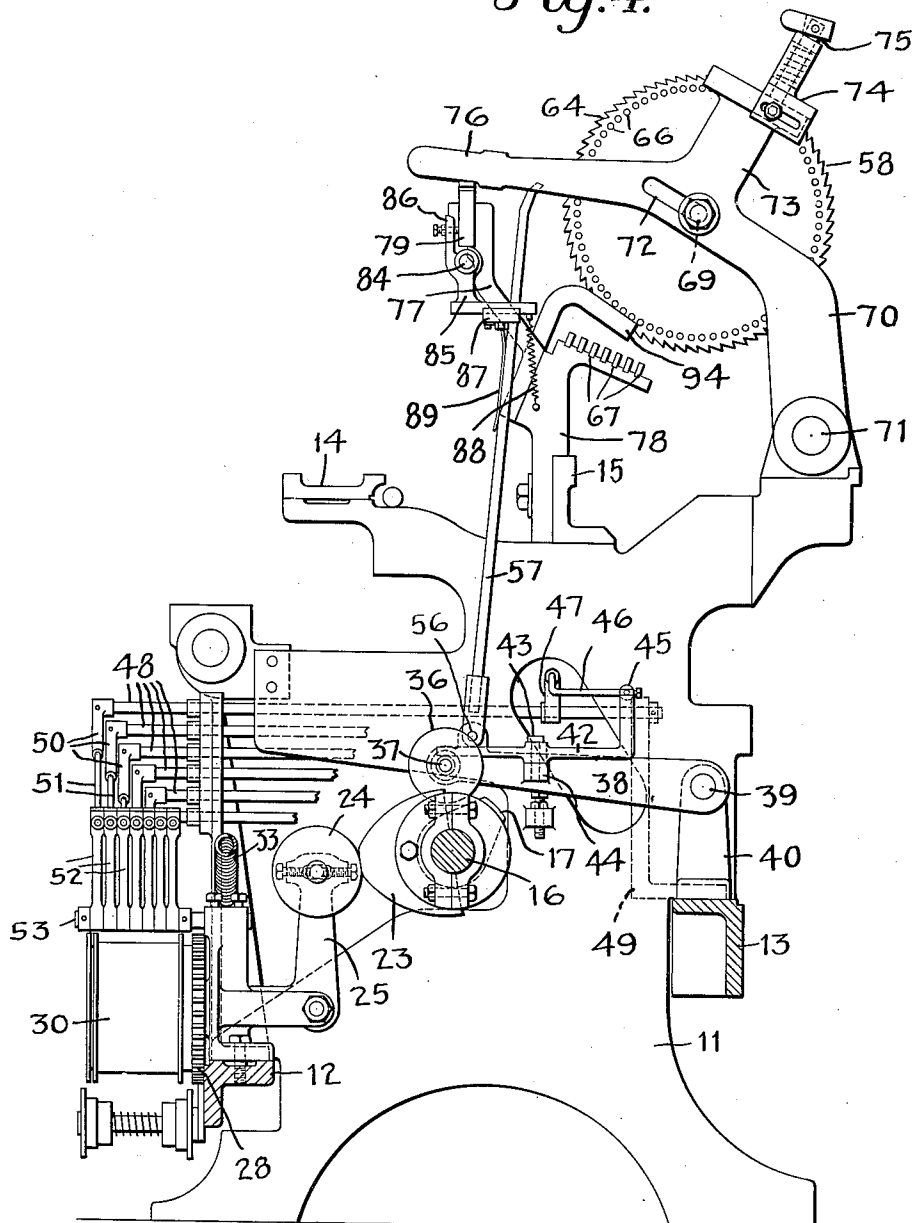
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Fig. 4.



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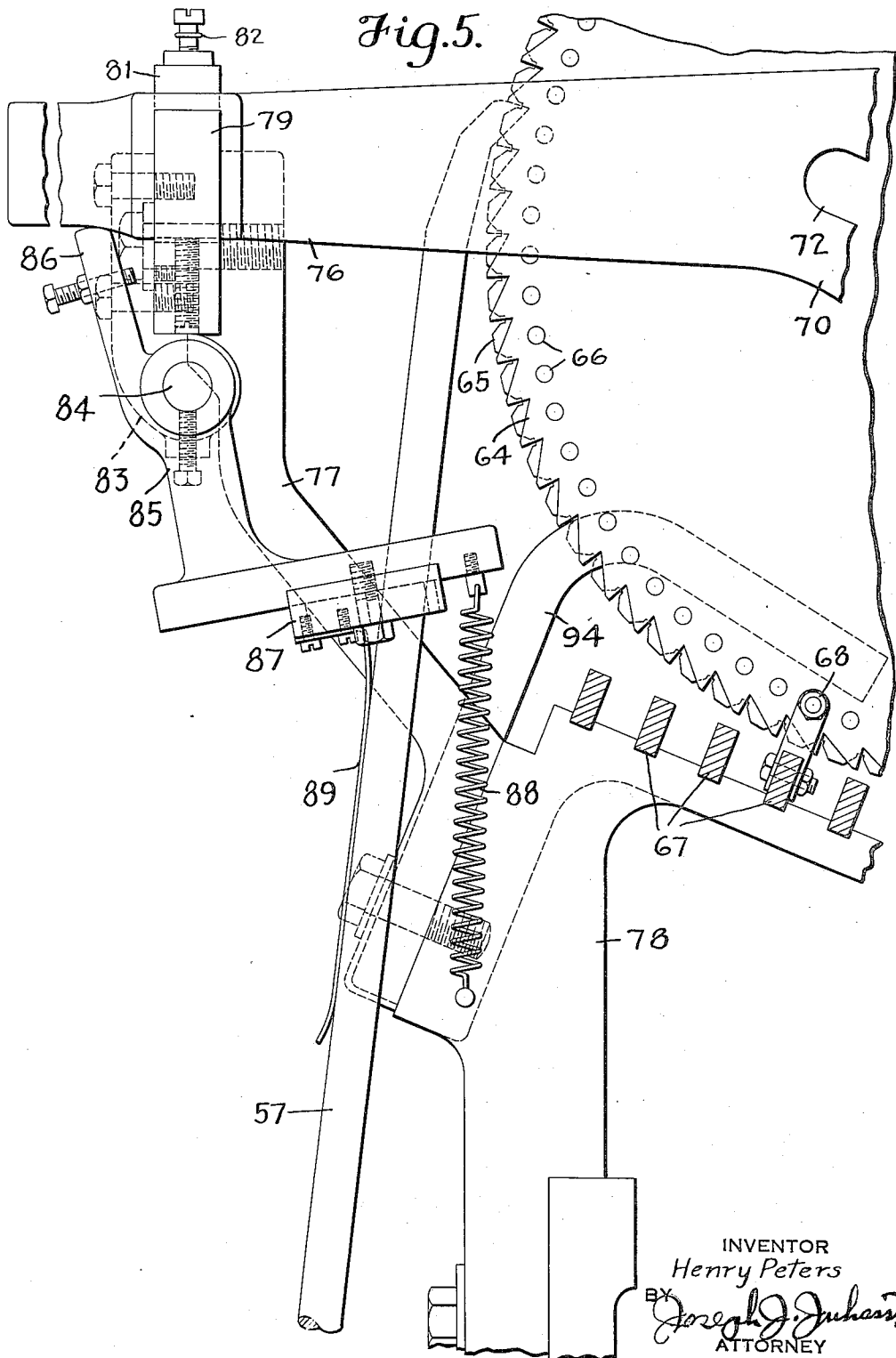
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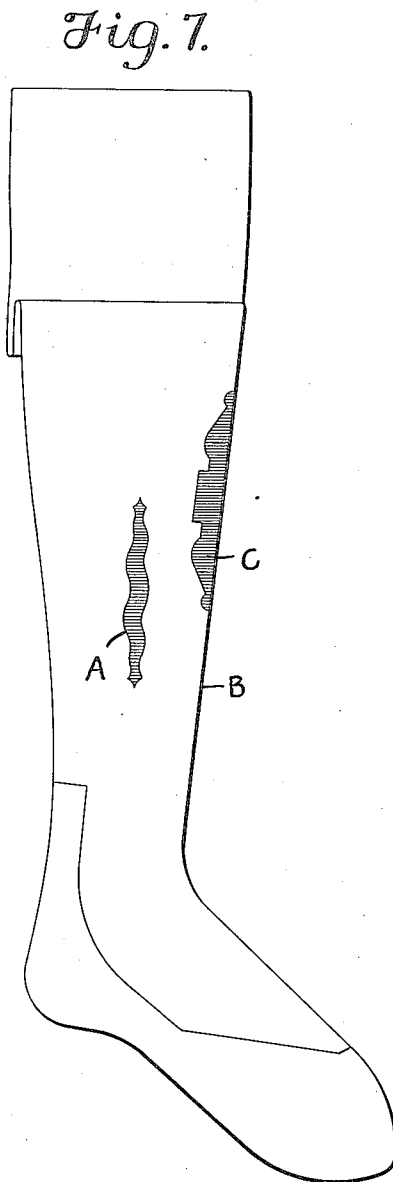
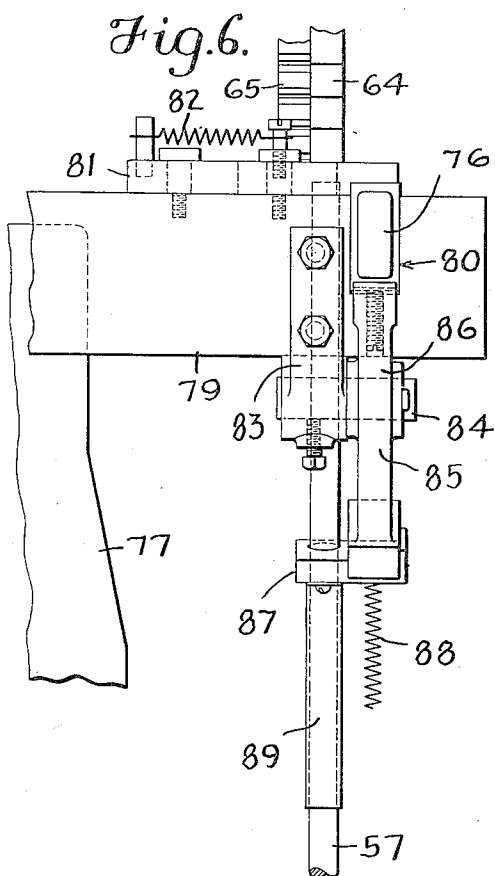
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6 Sheets-Sheet 6



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KNITTING MACHINERY

Application filed December 3, 1931. Serial No. 578,777.

The invention relates to straight bar knitting machines for knitting so-called full-fashioned stockings and it more particularly has to do with an attachment or means for knitting into any desired portion of the flat stocking blank designs of any desired character.

5 The principal object of the invention is to provide an attachment of this character which is exceedingly simple, considering the work accomplished. A further object is to provide a means for controlling the knitting of a plurality of different designs made by looping an extra or reinforcing thread with the main thread. These designs may be formed individually on different portions of the stocking or simultaneously on adjacent portions of the stocking or in staggered relation to each other.

10 The invention contemplates a plurality of pairs of designing drums having abutments between which a stop or a thread carrier bar is reciprocated. The abutments or pins on the designing drums are spaced apart to accommodate a one-needle movement of the thread carrier bars.

15 Other objects and advantages of the attachment will become apparent as this specification proceeds.

20 Referring to the drawings in which a preferred embodiment of the machine is illustrated:

Figure 1 is a front elevation showing the attachment applied to a standard straight bar knitting machine;

Figure 2 is a plan view;

Figure 3 is a sectional plan view taken on line 3—3 of Figure 1;

40 Figure 4 is an end elevation, parts being in section;

Figure 5 is a fragmentary detail view on a larger scale showing part of one of the designing rollers and its associated parts;

45 Figure 6 is a fragmentary detail front elevation; and

Figure 7 is a view of a full fashioned stocking with designs indicated thereon.

50 Referring again to the drawings, the reference numeral 10 designates one of the end frames or standards and 11 one of the in-

intermediate frame of a conventional straight bar knitting machine. The machine may be a logger or a footer or a machine capable of knitting the flat stocking blank in its entirety. The frames are secured together by the conventional longitudinally extending members 12, 13, 14, and 15.

The usual cam shaft 16 is continuously driven by the gear 16^a which is meshed by a pinion (not shown) which in turn is driven from a suitable source of power. The cam shaft has mounted thereon cams, 17, 18, 19, 20, 21 and 22. These cams through mechanism hereinafter described drive the designing drums.

Another cam 23 is secured to the cam shaft 16. This cam engages a cam roller 24 mounted on an arm of a bell crank lever 25. An abutment on the other arm of the bell crank lever engages a lever 26 which carries a pawl 27. This pawl engages a toothed wheel 28 mounted on a shaft 29 to which is secured a drum 30 which drives a jack chain 31. The jack chain carries the usual buttons, two of which are indicated at 32, which are properly distributed to cause the parts to function at the proper times in a manner hereinafter described.

A spring 33 secured at one end to the lever 26 and at the other end to some stationary part of the machine maintains the levers 26 and 25 in engagements with each other and consequently the cam roller 24 in engagement with its cam 23. In order to permit the designing mechanism to be thrown out of operation when desired, the pawl 27 is provided with an upwardly extending arm which may be engaged by a contact member of any ordinary description to hold the pawl out of engagement with the toothed wheel 28. This mechanism, as indicated in the drawings, takes the form of a ratchet wheel 34 which is mounted on the lever 26 supporting the pawl 28. When so desired, the ratchet wheel 34 may be turned into a position to disengage the pawl. A holding pawl 35 is provided to prevent over running of the toothed wheel 28.

Working in conjunction with each of the cams 17 to 22 are cam rollers 36. The cam

rollers 36 are slidably mounted on studs 37 which are carried by arms 38 which are mounted for rocking movement on a shaft 39 having its bearing in brackets 40 secured to the longitudinally extending member 13. The heels of the cam rollers 36 have annular grooves 41 which are engaged by levers 42 pivoted at 43 to ears 44 on the arms 38.

The ends of the levers 42 beyond their pivotal points extend upwardly and are pivoted at 45 to connections 46 the opposite ends of which are secured to levers 47 fast to horizontal shafts 48.

The horizontal shafts 48 are supported in brackets 49—49 which are mounted on the longitudinally extending members of the machine. The forward ends of these shafts have arms 50 fast thereto. The outer ends of arms 50 have secured thereto other connections 51, the opposite ends of which are connected to one of the arms of bell crank levers 52 pivoted at 53. The other arms of the bell crank levers have depending lugs 54 which are held against the jack chain by springs 55.

In Figures 1 and 2, a number of the connections 46 and 51 have been broken away for simplicity of illustration. It will be apparent from the foregoing description and an inspection of the drawings that when one of the buttons 32 on the jack chain engages one of the depending lugs 54 on one of the bell crank levers 52, that particular lever will move its connection 51 toward the right in Figure 1. Through the medium of its arms 50, horizontal shaft 48 and lever 47, one of the connections 46 will be moved toward the left in Figure 3. One of the levers 42 will then cause its respective cam roller 36 to engage one of the cams 17—22. Thus according to the positioning of the buttons on the jack chain any individual one of the cams 17 to 22 may be engaging its cam roller or they may all be engaging the cam rollers simultaneously.

Pivoted at 56 to the arms 38 are long pawls 57. As the cams 17 to 22 engage their cam rollers the arms 38 and pawls 57 will be raised. This movement causes the designing drums 58, 59, 60, 61, 62 and 63 to be advanced, the movement of the designing drums naturally being dependent upon whichever of the cams 17 to 22 may be in engagement with its cam roller.

Each of the designing drums comprises a ratchet or toothed wheel 64 and a notched wheel 65 which are suitably secured together or may be made integral. Removably mounted adjacent the periphery of the notched wheels 65 are pins 66. The designing drums are arranged in pairs 58—59, 60—61, and 62—63. If desired, additional pairs of designing drums may be employed.

As will be noted, the pins 66 project varying distances from the faces of the notched

wheels 65. The pins act as abutments for controlling the movements of some of the thread carrier bars 67, each of the thread carrier bars to be controlled having thereon an adjustable stop 68.

It is to be understood each of the thread carrier bars carries the conventional yarn or thread guide or carrier. When the machine is functioning, one of the thread carriers, which would be termed the main thread carrier, and its bar are traversing the full width of the stocking web or blank. The thread carrier bars cooperating with the designing drums may be brought into operation at any desired time and an extra or reinforcing thread is then looped with the main thread so as to form the design laid out on the respective pairs of designing drums. Great varieties of designs may be worked out and different designs may be located on any part of the stocking. As illustrated in Figure 7, the designing drums 58—59 and 62—63 form a pair of designs A (one of which is shown) on the sides of the stocking B and the drums 60—61 form the central design C.

The drums are freely mounted on studs 69 which are carried by arms 70 pivoted at 71 to the frame of the machine. Slots 72 are provided in the arms 70 so that the drums may be moved fore and aft to properly line up the pins 66 with the stop 68 on the desired thread carrier bar 67.

Upward extensions 73 from the arms 70 carry slotted members 74 which support spring pressed plungers or detents 75, the lower ends of which engage the notched wheels 65. After pins on the designing drums have been lined up with the stops on the thread carrier bars, the slotted members 74 may be adjusted to properly line up the plunger 75 with one of the notches in the notched wheel 65. As the pawls 57 engage the toothed wheels 64 on the designing drums and advance them tooth by tooth so as to bring the successive pins on the drums in engagement with the stops on the thread carrier bars the plungers 75 properly position the designing drums and prevent over running.

Each of the arms 70 is provided with a handle portion 76 so that when desired the designing drums may be lifted bodily out of the path of the stops on the thread carrier bars. Means are provided for locking the arms with their designing drums in the operative position.

Brackets 77 are bolted to the carrier bar supports 78 and these brackets have secured thereto a longitudinally extending member 79. The member 79 is provided with a plurality of openings 80 into which the handle portions 76 of the arms are adapted to be positioned and locked therein. Latch members 81 are slidably mounted on the longi-

itudinally extending member 79. The latch members are slotted and springs 82 normally hold them over the openings 80. When it is desired to enter or withdraw one of the handle portions into or out of one of the openings 80, the latch member is moved over manually.

Brackets 83 are secured to the member 79. Pivoted at 84 in these brackets are arms 85, the upwardly extending portions 86 of which are adapted to be engaged by the handle portions 76 when they are entered into the openings 80. The depending portions of these arms 85 carry pawl guides 87 for the pawls 57. The pawls 57 pass through apertures in those guides and when the handle portions 76 are withdrawn from the openings 80, springs 88, pull the pawl guides 87 downwardly, this movement causing the pawl to be withdrawn from the toothed wheels 64. The pawl guides or depending portions of the arms 85 carry flat springs 89 which normally press the pawls toward the toothed wheels 64.

Means indicated in Figure 1 are also provided for automatically stopping this machine from the jack chain 31. It is desirable to effect this stoppage when the end of any particular design is reached. An additional connection 90 extends between one of the levers 52 and one arm of a bell crank lever 91. The other arm of the bell crank lever through a connection 92 operates a rod 93 which extends to the conventional mechanism for stopping the machine. The connection 92 permits of the machine being stopped for other reasons without disturbing the designing mechanism.

The carrier bar supports 78 also have mounted thereon substantial angled brackets 94. There brackets abut the faces of the ratchet wheels 64 and act as shock absorbing members, absorbing the shocks transmitted to the designing members by contact of the stops 68 with the pins 66, thus insuring an accurate movement of the thread carrier bars and their thread carriers.

In Figure 1, the reference numeral 95 indicates the conventional fashioning screw used for narrowing or widening. This screw has the usual carrier bar stops and means indicated generally at 95 for rotating it. Frame needles are indicated at 97 and narrowing fingers at 98. It is to be understood that only the parts of the machine relating to the invention have been illustrated in detail.

Such changes in arrangements of parts and details of construction as would occur to one skilled in the art are to be construed as coming within the spirit of the invention set forth in the appended claims.

I claim:

1. In a straight bar knitting machine, the combination of reciprocating carrier bars,

stops of said carrier bars, a plurality of pairs of designing drums, each drum comprising a toothed wheel, a notched wheel and pins carried by and extending different distances from said drums, said stops on said carrier bars being adapted to move between the pins of each pair of designing drums, pawls engaging said toothed wheels for advancing said designing drums, pivoted arms far carrying said designing drums, handle portions on said arms, and means for locking said handle portions when said drums are in their operative positions.

2. In a straight bar knitting machine, the combination of reciprocating carrier bars, stops on said carrier bars, a plurality of pairs of designing drums, each drum comprising a toothed wheel, a notched wheel and pins carried by and extending different distances from said drums, said stops on said carrier bars being adapted to move between the pins of each pair of designing drums, pawls engaging said toothed wheels for advancing said designing drums, pivoted arms for carrying said designing drums, handle portions on said arms, longitudinally extending members adjacent said drums, openings in said longitudinally extending members to accommodate said handle portions, and means for locking said handle portions in said openings.

3. In a straight bar knitting machine, the combination of reciprocating carrier bars, stops on said carrier bars, a plurality of pairs of designing drums, each drum comprising a toothed wheel, a notched wheel and pins carried by and extending different distances from said drums, said stops on said carrier bars being adapted to move between the pins of each pair of designing drums, pawls engaging said toothed wheels for advancing said designing drums, pivoted arms for carrying said designing drums, handle portions on said arms, pivoted members co-operating with said arms, said pivoted members carrying guides for said pawls, and springs causing said pawl guides to move said pawls away from the toothed wheels of the designing drums when the designing drums are moved to their inoperative positions.

4. In a straight bar knitting machine, the combination of reciprocating carrier bars, stops on said carrier bars, a plurality of pairs of designing drums, each drum comprising a toothed wheel, a notched wheel and pins carried by and extending different distances from said drums, said stops on said carrier bars being adapted to move between the pins of each pair of designing drums, pawls engaging said toothed wheels for advancing said designing drums, pivoted arms for carrying said designing drums, handle portions on said arms, pivoted members co-operating with said arms, said pivoted mem-

bers carrying apertured guides for said
pawls, springs causing said pawl guides to
move said pawls away from the toothed
wheels of the designing drums when the
5 designing drums are moved to their inop-
erative positions, and other springs carried
by said pivoted members for urging said
pawls towards the toothed wheels when the
designing drums are in their operative po-
10 sitions.

Signed at New York city in the county
of New York and State of New York this
2nd day of October 1931, A. D.

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HENRY PETERS.

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