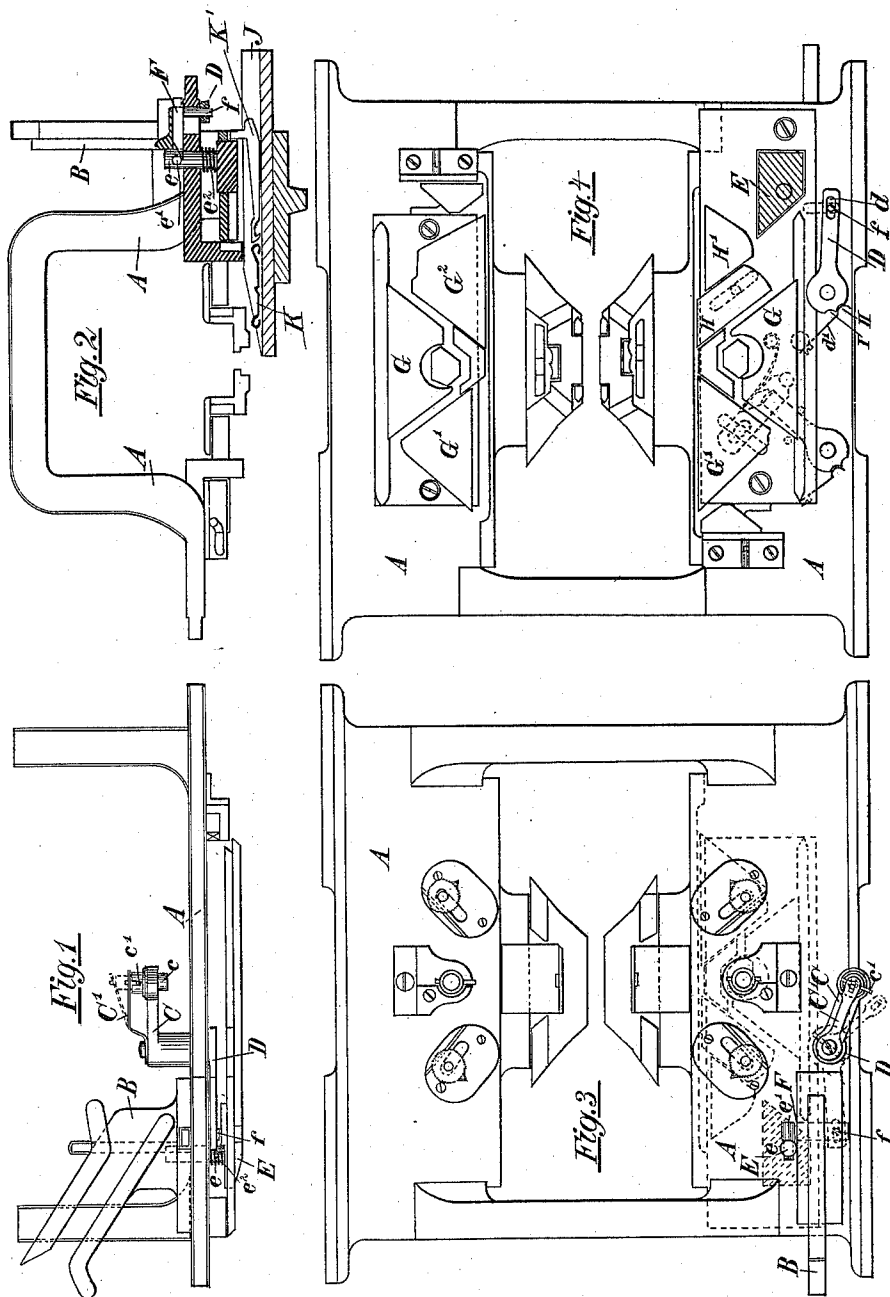


(No Model.)

H. STOLL.
KNITTING MACHINE.

No. 579,411.

Patented Mar. 23, 1897.



Witnesses:

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UNITED STATES PATENT OFFICE.

HEINRICH STOLL, OF REUTLINGEN, GERMANY.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 579,411, dated March 23, 1897.

Application filed January 18, 1896. Serial No. 576,035. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH STOLL, manufacturer of knitting-machines, of Reutlingen, Württemberg, Germany, have invented new and useful Improvements in Knitting-Machines, of which the following is a specification.

My invention relates to an improvement in knitting-machines.

10 The object of the present invention is to produce a peculiar lock arrangement for a knitting-machine, for example, such as shown and described in United States Patent No. 523,820, granted Stoll and Maercklin, for the purpose of producing figured goods (consisting of rib meshes alternating with smooth meshes) by the aid of any jacquard apparatus mechanically and automatically.

It is well known that for the purpose of preventing the formation of rib meshes by all of the needles the needles which are designed to produce smooth instead of rib meshes must be withdrawn into the needle-bed so far as not to be grasped by the hooks of the needle-jacks of the other needle-bed. This object I attain by causing all the needles to be retracted to a suitable extent by a special arrangement on the lock or cam mechanism for each complete stroke of the carriage during one movement of the carriage, and at the completion of the movement of the carriage in one direction to cause the needles serving for the formation of rib meshes to be again advanced by a jacquard apparatus to an extent sufficient to permit such needles to be grasped by the jacks of the opposite needle-bed on the second movement of the carriage.

The retraction of all the needles forms the subject of my invention, and it is carried out automatically by a vertical adjustable lock portion arranged behind the usual lock.

15 In the accompanying drawings, Figure 1 represents a front elevation; Fig. 2, a side elevation, one of the jacks and its needle being shown at the right in the corresponding needle-bed J, the needle-bed and jack at the left not being shown; Fig. 3, a top plan, and Fig. 4 a bottom plan.

30 In the drawings it is assumed that the new lock arrangement is applied only to one (the front) side of the lock. Manifestly the same

may be employed upon the other side of the lock.

As appears from Fig. 4, the cam device G G' G² remains unchanged upon the rear portion of the carriage, while that upon the front portion is provided with the new vertically-adjustable cam portion E, and besides is modified as follows: Instead of the lock portion G² two parts H and H' are provided, of which the part H' is fast to the carriage, while the other part, H, is adjustable in the well-known manner, just like G² of the usual cam device. The cam portion E, arranged at the side of the cams H and H', serves to withdraw all the jacks K' with the needles K into the one needle-bed J to an extent sufficient to prevent the forward hooked ends of the latter from being grasped by the advanced jacks of the other needle-bed.

70 The cam portion E is vertically adjustable, and in the movement of the carriage in that direction where the extra cam portion is in advance of the cam device the said extra cam portion E is automatically lifted at the change of stroke, remaining thus lifted during the entire movement of the carriage, and descends automatically only after the completion of such movement, remaining in such lower position during the entire following return stroke of the carriage, when the extra cam portion E is in the rear of the cam device. By this action the retraction of all the needles is effected.

85 The vertical adjustment of the cam portion E is automatically effected at the change of stroke in the following manner: Upon the cam portion E is secured a stem *e*, passing through the carriage A and provided with a cross-pin *e'* on the upper side of the carriage. A spring *e*² is arranged between the carriage A and the cam portion E, which spring tends constantly to depress the part E. For raising the cam portion E a wedge F, running to a point, is mounted so as to slide in the guide-piece B. The guide-piece B actuates the jacquard apparatus. This wedge on sliding passes under the cross-pin *e'*, raising the same, with the stem *e* and cam portion E, to a sufficient extent to enable the same to avoid striking the jack-heads, and hence to make it inoperative. This raising and lowering is ef-

fected automatically by securing to the wedge
 F a stem *f*, passing through the carriage A,
 as shown at the right in Fig. 2, the said stem
 engaging a crank D, secured to a pivot pass-
 5 ing through the carriage. The latter carries
 another crank C at the top, whose stud *c* at
 the end of the movement of the carriage in
 one direction strikes against a tappet mount-
 10 ed on the guide-rails of the knitting-machine
 in the usual manner, whereby the crank D is
 turned. At the end of the return stroke of
 the carriage the crank D is then restored to
 its original position. In the one case the
 wedge F is inserted below *e'* and E is lifted.
 15 In the other case the wedge is returned to its
 starting-point and E is lowered. When the
 cam portion E is not to be lowered, but to re-
 main out of use, the stud *c*, which is held de-
 pressed in the crank C by means of a spring
 20 C', is lifted, turned, and retained by the cross-
 pin *e'*, resting against a projection on the
 crank C. A spring *d'*, (see Fig. 4,) adapted
 to engage one or the other of the two notches
 or rests I and II, serves to retain the crank D
 25 in the positions where E is raised or lowered.
 The cam H H' must consist of two parts,
 because without the fixed cam portion H' a
 gap would be formed through which the pro-
 jecting jack-heads might slip as soon as H is
 30 retracted, as indicated, for example, in Fig. 4.
 Hence the fixed cam portion H' forms a bridge
 between the movable cam portion H and the
 new cam portion E. In order, however, to
 adapt the machine to the knitting of ordinary
 35 ribbed goods, the cam portion H must be
 adapted to be shoved forward sufficiently that,
 in conjunction with the fixed cam portion H,
 it may be employed just like the cam G²,
 which consists of one piece.
 40 While I have particularly described my in-
 vention in connection with a machine whose
 needles are moved through the intervention
 of jacks, it is to be understood that my inven-
 tion may be employed in connection with a
 45 machine where the needles are directly con-
 trolled by the cams and retracting mechan-
 ism without the intervention of jacks or their
 equivalents.

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

1. In a knitting-machine, the combination,

with two needle-beds, of cam mechanism for
 each bed, a retracting mechanism for one bed,
 and mechanism for throwing out said retract- 55
 ing mechanism at the end of one stroke and
 for throwing it into action at the end of the
 other stroke.

2. In a knitting-machine, the combination,
 with two needle-beds, jacks for each needle- 60
 bed, and needles operated by the jacks, of a
 jack-operating cam mechanism for each set
 of jacks, a jack-retracting mechanism for one
 set of jacks, and automatic mechanism for
 throwing said jack-retracting mechanism out 65
 of action at the end of one stroke and for
 throwing it into action at the end of the other
 stroke.

3. In a knitting-machine, the combination,
 with two needle-beds, of a cam mechanism 70
 for each bed, comprised of two parts, a re-
 tracting mechanism arranged laterally be-
 hind the two parts of one cam mechanism,
 and mechanism for raising said retracting
 mechanism at the end of one stroke of the 75
 machine and for lowering it at the end of the
 other stroke.

4. In a knitting-machine, the combination,
 with two needle-beds, jacks for each needle- 80
 bed and needles operated by the jacks, of a
 jack-operating cam composed of two parts, a
 jack-retracting cam arranged laterally be-
 hind said two parts and automatic mechan-
 ism for raising said jack-retracting cam at
 the end of one stroke of the machine and for 85
 lowering it at the end of the other stroke.

5. In a knitting-machine, the combination,
 with a vertically-movable cam, of a stem to
 which said cam is attached, a spring tending
 to hold the stem downward, a pin secured in 90
 said stem, a wedge arranged to enter beneath
 the pin, a pair of cranks connected to said
 wedge and fixed to each other, a stud, ad-
 justable in and out on one of the cranks, and
 a stop device against which the stud contacts, 95
 whereby the cam is raised at one end of the
 stroke, substantially as set forth.

In testimony whereof I have signed this
 specification in the presence of two subscrib-
 ing witnesses.

HEINRICH STOLL.

Witnesses:

AUGUST B. DRAUTZ,
 CHRISTIAN BANCE.