

Instruction-Book

for the use of the best approved
and all over the world renowned

Family-Knitting-Machine with Tube-locks

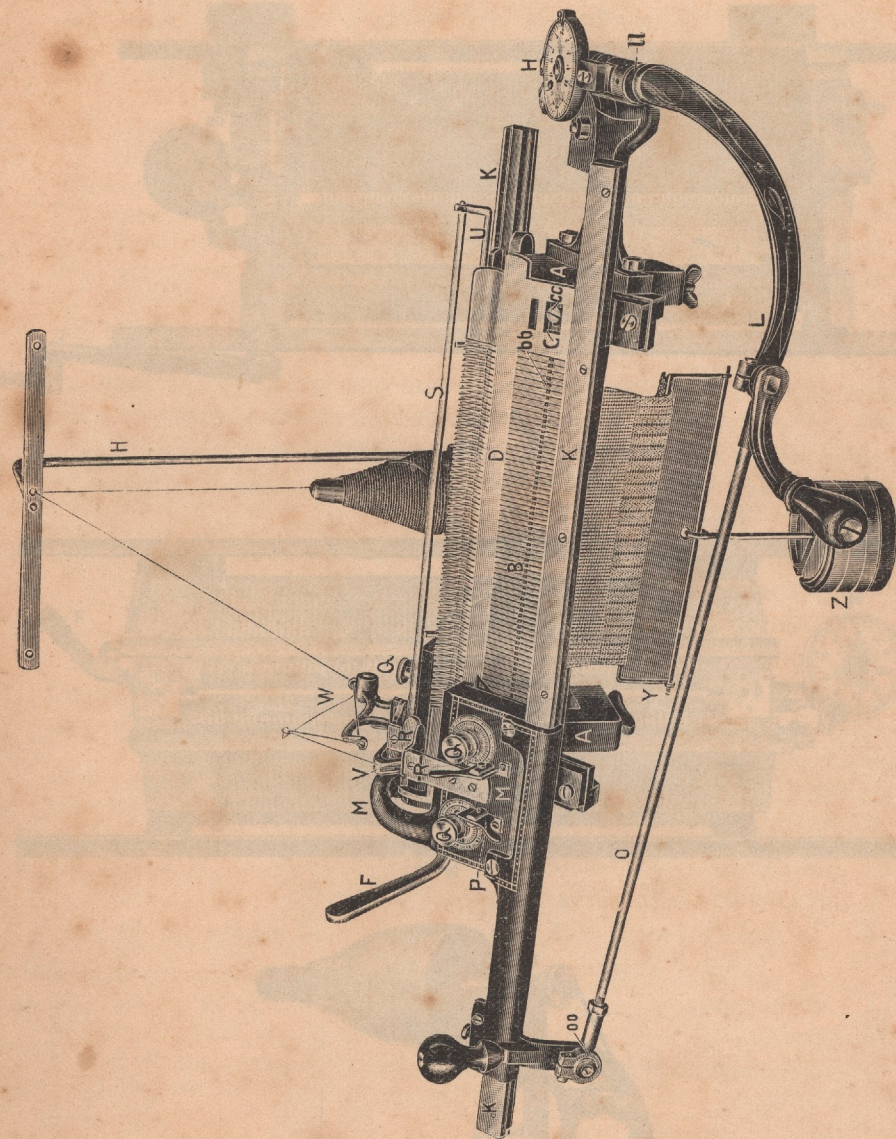
for knitting of Socks, Gaiters, Jackets,
Waiscoats, Gloves, Children-dresses,
Ladies-skirts etc.



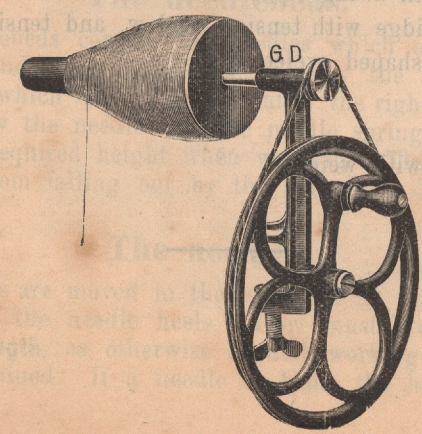
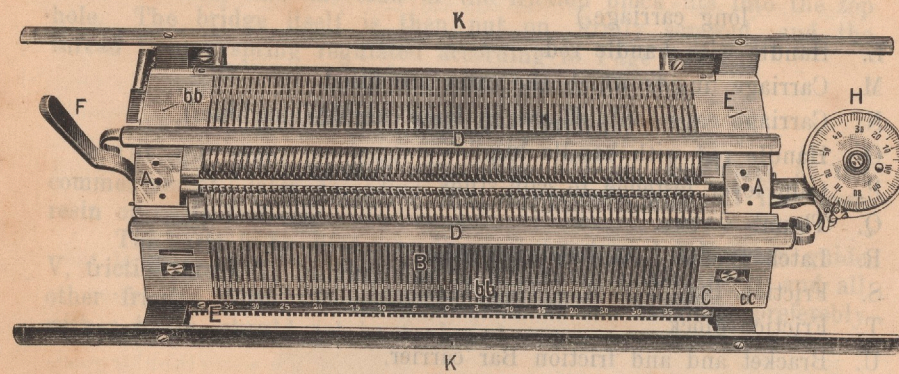
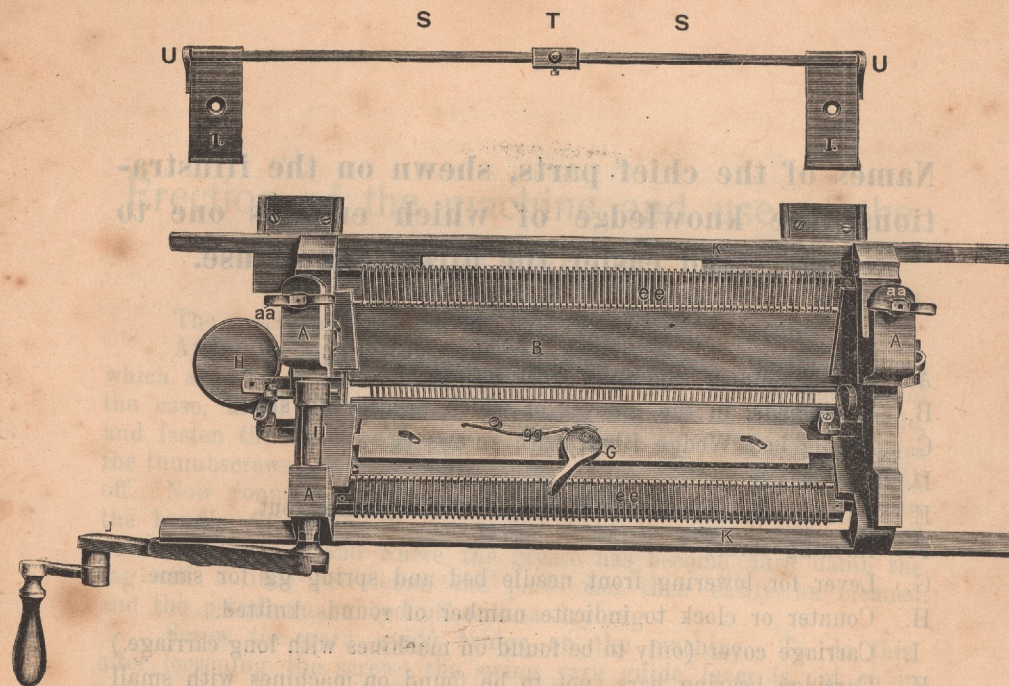
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Names of the chief parts, shewn on the illustrations, the knowledge of which enables one to understand easier the directions of use.

- A. Fundaments or Sidewalls with screws aa.
- B. Needlebeds, in the grooves of which needles bb slide.
- C. Needle bed Wedge Block with screws cc.
- D. Needle bar.
- E. Bars preventing needle Springs ee from falling out.
- F. Racking lever.
- G. Lever for lowering front needle bed and spring gg for same.
- H. Counter or clock to indicate number of rounds knitted.
- I. Carriage cover (only to be found on machines with long carriage.)
- K. Carriage bearing bars (not to be found on machines with small long carriage.)
- L. Handle with handle rod
- M. Carriage, inside which the cams are fitted.
- N. Carriage caps (only found on long carriage machines).
- O. Handle rod with handle lug.
- P. Cam lever fastened to cam-studs.
- Q. Thumb screws.
- R. Latch opener. (Knives or brushes.)
- S. Friction Bar.
- T. Friction-block.
- U. Bracket and and friction Bar carrier.
- V. Yarn-guide with swing lever.
- W. Yarn-guide Bridge with tension stud w, and tension spring ww, and V shaped eyelet w 1.
- X. Bobbin-stand.
- Y. Buckle.
- Z. Weight-stand with weights.

Erection of the machine and use of the apparatus.

The machines are sent out, well packed, and tested.

After the top of the case has been removed and the screws which are visible on the outside taken out, take the machine out of the case, fasten the enclosed iron table bracket on a strong table, and fasten the machine on to it. Care must be taken not to injure the thumbscrews aa by hammer blows, as the clamps A might break off. Now connect the driving rod O with the carriage and screw the handle on. Rub off the grease used to protect the polished parts with a rag, and where the grease has become hard damp the rag with a little petroleum, the parts can then easily be cleaned and the petroleum rubbed off with a dry rag.

Screw the yarn guide bridge on the machine. To do this, after loosening the screws the swing yarn guide lever is put on in such a manner that the stud of the friction block fits into the top hole. The bridge itself is then put on, firmly screwed, and the thread tension spring regulated according to Page 9.

Oiling the machine.

Oil the machine often — every day — especially at the commencement, later according to requirement, with oil free from resin or neats foot oil.

The parts to be oiled are: Carriage bearings I & K, yarn guide V, friction block T, guiding bar S, handle L, needle heels and all other friction parts. Frequent cleaning of the machine, preferably with a brush, should not be neglected.

The needlebeds.

The needlebeds contain the needles which are provided with turnable latch and heel. These are held by the needle bar provided with hooks which can be drawn out to the right or left, in direction. Below the needles are the needle springs which hold the needles at the required height when working. The needle springs are prevented from falling out by the spring-bar E at edge of the needlebeds.

The needles.

The needles are moved in their grooves by the working of the lock parts upon the needle heels. They must always be **equal in strength and length**, as otherwise regular working and even goods may not be obtained. If a needle is bent, the head or the latch



damaged, it must be made exactly right, or if this is not possible, a new one substituted. For this purpose, remove the needle bar by the hook in the arrow direction, so that the needles can be taken out. If the needle bar cannot be drawn out by means of the finger hook, then try a few knocks with something wooden at the opposite end of the bar. The needles must never all be taken out at once, as each needle runs in its own groove, and by changing the position of the needles the machine would refuse to work. It is better to procure the needles from the place from which the machine has been bought, and a sample needle should always be sent.

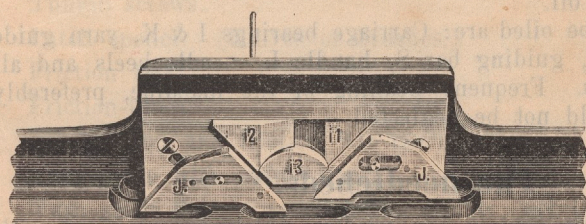
The carriage.

Underneath the carriage are the locks which give the needles their necessary movement for the formation of stitches.

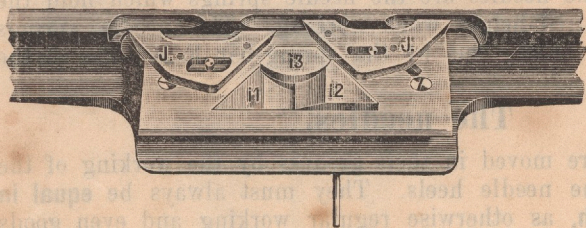
If the carriage has to be removed to clean the locks or to inspect any damage, unscrew racking lever F, left bracket U, and connecting rod O from the connecting lug, and the carriage can then be drawn to the left off the carriage bearing bars.

The locks.

Front view sketch.



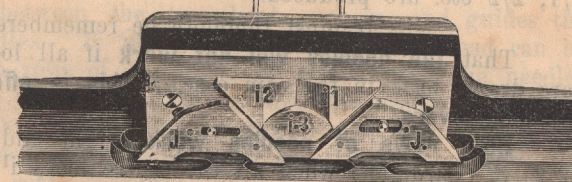
Position of the locks when manufacturing plain tubular goods.



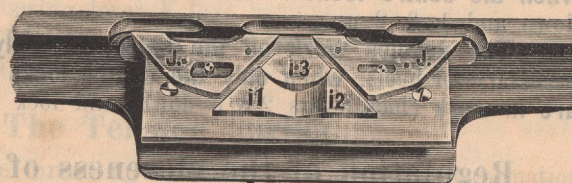
At the back the right centre lock is seen and in front the left centre lock.

Back view sketch.

Position of the locks (needle lifters) when making 1/1 ribs 2/2 and cardigan.



All the centre locks are shown working.



The locks consist of the stitch locks — the 4 side triangles J — and needle lifter or centre locks, which is the middle part, which again consists of several parts i^I & i^{II} , i. e., lifting locks, which are worked by the levers P above the carriage, and also the fixed part i^{III} . The position of various parts of the centre locks are changed by the lock levers P, (which projects from the carriage) according to the movement of the needle required in the various kinds of knitting.

Description of lock lever. The carriage seen from above:

Lock lever No. 1 front right.	i^I	2	3	i^{II}
" " " 2 back left.				
" " " 3 " right.				
" " " 4 front left.	i^{II}	4	1	i^I

If all the lock levers are raised, the lifting locks i^I & i^{II} are drawn back in the lock plates, consequently the needles do not operate.

If the locks i^{II} front and back are lowered — (i. e. cam levers 3 & 4 down) — by the movement of the carriage from left to right the back needles are pushed against lock i^{II} (3) and led up until they are again led down by the stitch lock J and when the carriage is moved from right to left, will cause the front needles only to work, the back needles automatically raising the lock i^{II} (4) by means of the heels of the needles passing under its bevelled edge leaving the needles stationary in their usual working position. As now one centre front & back lock are in action, the front and back row of needles work alternately, and tubular knitting is produced.

If the back and front locks i^I & i^{II} are set in work, (i. e. all lock levers down,) both rows of needles are worked at the same

time by every movement of the carriage, and so ribbed and cardigan 1/1, 2/2 etc. are produced.

It must therefore be remembered:

That **the needles will not work** if all locks, i^I & i^{II} are up (are drawn back in the cam case). **This is effected by raising all the lock levers.**

Both rows of needles work (right and right (1/1) Patent (2/2) & (Cardigan) when all the centre locks i^I & i^{II} are in movement, **effected by lowering all the lock levers.**

Alternate front and back row of needles work (plain tubular) **when the centre locks i^I are in action** and the lock levers 3 & 4 down and 1 & 2 up.

The needles work on the back side only, as for example is necessary for heels, **when only the centre locks i^I & i^{II} at the back are in work** (lock levers 2 & 3 down, and lock levers 1 & 4 raised).

Regulation of the closeness of the goods.

This is effected by thumbscrews 1—4, by which the stitch locks are moved. Loosen thumbnut No. 55 a little when the under nut 54 and the pointer No. 53 connected therewith can be easily moved. When the pointer is set, by means of the under nut, to the right degree, hold the under nut with the left thumb and forefinger so that it cannot slip, then screw the top thumbnut tight again with the right hand. (For No. 53, 54 & 55 see end of book.)

For regulating in general, follow the instructions given further on for the various kinds of knitting.

The small screws which hold the Brass tension dial plate must not be loosened under any circumstances, as this would prevent the stitch locks being set equally by the pointer.

The nearer the indicator is pushed towards degree 1 the tighter the goods are, and slacker when towards 25.

When changing the closeness of the fabric, or from one kind of knitting to another, **all the cams must not be displaced at once, but only those which are actually working.**

When moving carriage to the left, alter tensions 1 & 3, when moving the carriage to the right alter tensions 2 & 4. The lock levers can be raised or lowered as necessary but only when the locks are not over the needles in action.

The Latchopeners.

The latchopeners which are in finer machines as Class 3 are many times substituted by brushes. They are to open the needle latches when knitting, in order that the needle hooks may be free and take in the thread. They must be set just over the needle hooks without rubbing them. **When the latch opener is at the right height, about $\frac{1}{16}$ " of the spoon of the latch shows under the latch opener.**

The Yarnguide.

This travels between the two latch openers and guides the thread to the needles. It must be set so that the thread can be well caught by both rows of needles: if it is too high the needles may not catch the thread, and if too low, the needle latches are damaged. In working it is guided by the friction block T gliding on rod S. The movement must be light and elastic to ensure the yarn guide working with certainty.

When it is necessary to remove the carriage, take care when replacing same to see that the stud of the friction block T engages in hole of the yarn swing lever V.

If the friction block T binds, see if the friction rod S is bent, and if so, straighten.

The Tension Spring.

This draws the thread up regularly, and prevents the formation of loose loops or stitches at the end. By turning the thumbnut, the tension can be regulated as desired. If the resistance of the tension spring relaxes, loosen No. 95 screw to the right of the tension thumbnut and loosen also counterscrew No. 96 to the left in the tension thumbnut (to the outside) according to requirement, and retighten screw No. 95. The regulating thumbnut No. 93 will now be much harder to move. (For No. 93, 95 & 96 see end of book.)

The Counter.

This is moved one tooth further on each time the handle is turned, and so indicates the number of rounds knitted.

The racking of the needle bed.

The front needle bed can, by lever F, be racked over 1 needle. Further, for more convenient picking up of work (taking up stitches etc.) the bed can be let down, for which purpose eccentric lever G is used. Generally the racking lever is at the front. When working the machine, the bed must always be closed.

Winding of the bobbins.

This is of importance. Begin at the bottom of the spool and guide the thread about 2 inches towards the point, then back again and so on, gradually increasing towards the point so that a cone shaped spool is obtained, wide at the bottom, from which the thread unwinds easily. Special care must be taken in winding that the thread does not dig into thread which has already been wound. Large knots should be avoided. A weaver's or a firmly tied sailor's knot (with not too short ends left on the thread) are most to be recommended. The small needle heads cannot work large knots; they also easily cause holes in the work.



The weights.

These are for the purpose of drawing the stitches from the needles. The quantity is arranged **according to the kind of work, the closeness of the work and the number of needles in work.** To take the work out of the machine, break the thread over the yarn guide, turn the handle round once, holding the comb **with the left hand.** All the stitches are then taken off and the work can be taken out of the machine.

Although all machines sent out are thoroughly tested by us, and thus all irregularities avoided, we give below a few points in case any difficulties should arise later.

If the **outside needles allow the stitches to drop or form long loops at the ends,** tighten the tension spring.

If the machine is **suddenly hard to work,** see if the yarn leaves the bobbin freely, if the friction is even and the friction block in order. The bobbin-stand should stand as far back from the machine as possible, in order that the thread may not feed too acutely through the tension spring bridge.

If the work **rises on the needles,** add weight. If the stitches do not slip below the latches when the needles ascend, the knitting is too tight. The same is the case when the stitches are rightly formed but do not fall over the hooks of the needles.

If **one needle in particular allows the stitches to drop,** see if the needle latch works freely and the needle hook or latch is normal.

If the machine **stops suddenly,** see if the needles which are not in work have moved out of place. The needles must be either **quite high,** that is, in working position, or **quite low,** out of working position; **there is no middle position.** The machine must be closed, the front needle bed quite high. **If, when in the same position, one stitch lock knits tighter or slacker than the others,** the brass tension disc has got out of place.

If the **thread breaks,** the yarn may be bad or of unequal strength, and perhaps quite unsuitable for the class of machine. Bad winding, tension-spring too strong or the bobbin-stand being too near the machine may also be reasons.

Broken stitches or holes in the knitting may occur if there is too much weight, also when the draw down weight is insufficient and when the thread guide rubs on the needle hook. Bad needles and large knots may also be the cause.

If **stitches drop at the corners,** examine the tension spring to see if it works correctly, the yarn guide, and see if the friction block is working regularly.

The work will be irregular if the stitch locks are not uniform, the needles bad, the rivets catch the thread, or if needles of unequal length are used.

The machine is hard to work when it is not oiled, the carriage caps (in long carriage machines) screwed on **too tightly,** or the **friction block** put on the wrong way.

If mistakes are made in knitting or any stitches drop and cannot be easily taken up by the hook and put on the needles, it is better to unravel a few rows of stitches. For this purpose decrease the taking-off weight, hold the end of the thread $\frac{1}{2}$ or 1 inch behind the last stitches, rather high, pull the thread, moving the end backwards and forwards, so that the portion previously knitted can slip into the needle hooks over the last stitch and can be easily undone stitch by stitch. Then reknit the rows undone.

After reading the above repeatedly and carefully and becoming acquainted with the various parts, practise the regular turning of the machine, repeat from the beginning until quite certain of it, then commence to knit. It would be well for a second person to read aloud, and the learner to practise now carefully each of the instructions given.

Commence as follows:

All lock levers in operation (down). The desired number of needles are pushed up by the needle springs to hold them in working position. Put all the tensions on 16 and carefully turn the handle once, in order that all the needle latches may be opened, open the latches which are still closed with the work-hook. Before commencing, the handle is to right. Then place the spool on the bobbin-stand behind the machine (do not put the bobbin-stand too close to the machine) thread the yarn, as shown in the sketch, through the small hole at the top, then through the hole W at the back, the V shaped eyelet W1 and the yarn guide bridge V between the two needle beds, so that about 12 inches hangs down between the needle beds. Now hold the underneath end of the thread with the left hand and turn handle to the left, whereby all the needles catch stitches. Now take the setting up comb, and guide it, (after removing the setting up comb wire) up under the machine, through the first formed row of knitting, put through the eyes of the comb as far as it will go, the setting-up comb wire, hang the weights on the comb and fasten the end of the thread between the weights. Now put on the tension spring WW (hold the tension spring with the left hand and with the right hand fasten the thread between the V shaped eyelet and the yarn guide and from the left put the threads in the eyes) and continue.

Usually when the machines are sent out the springs are slack, therefore turn to the left the milled edged stud on the tension spring bridge, so that the spring becomes erect and the thread can be taken up. The comb must be arranged uniformly on the needles in working position, as otherwise the work will descend uneven.

The first round after the commencement round will be rather stiff. In order to have a more suitable commencement round, put



tensions 1 or 3 one one two degrees slacker, towards 25, naturally then, after the first formed round, all the tensions must be set uniform. The machine now works with both, back and front needles at the same time, to make ribbed work (Generally after commencing one does 8 rows of plain tubular; arrangement for this: tensions 1 & 2 on 18, 3 & 4 on „fest“, lock levers 1 & 2 not in operation.) The locks must always be fully passed over the needles in order that the end needles may knit well. Always turn the carriage about 2 inches over the needles in use. If the carriage is moved too far over the needles used, the tension spring can not draw up enough, and slack end stitches are produced. For the first trials, in which many mistakes may be made, it is better to use cheap grey or light coloured cotton yarn, which can be undone and used over again several times. After doing the commencement often, and being certain of it, begin to practise narrowing.

Push up all needles into operation (by the springs and quite and do 5—10 rounds in the manner described. Now take the narrowing comb with 3 needles. Suppose the carriage is at the left. With the right hand hold the narrowing comb having their screws upwards. With the left hand grasp the four front end needles by the heels, push them rather high so that the stitches push back the latches leaving the needle hooks free. The needles must not be pushed to high or the stitches will slip below the latches. Should this accidentally happen still see the latch is open, take the 3 eyelet narrowing comb, hook it in the 3 end needles and draw them quite high, push them down again so that the stitches may slip on the narrowing comb over the closing latches. Now hold the narrowing comb in this position with the right hand, take the work hook in the left hand and open the latches of the same needles. Then draw the narrowing comb towards the front in order that the stitches from the narrowing comb may slip again into the needle hooks. With 4th needle, do the same by means of the 1 eyelet narrowing comb. Then draw the four needles back again at about the same height as the other needles, put the 3 eyelet narrowing comb on the 3 end needles and draw the needles quite high with it in order that the stitches lying therein come to lie below the latches. Now hold the narrowing comb in the same position as the needles and needle beds, press the comb firmly and push down, pushing with it the 3 needles. The stitches below the latches will slip over the closing latches and on to the narrowing comb needles. Now incline the narrowing comb a little to the back, and lift it off the working needles, pushing the latches as far back as possible, so that needle hooks remain free. Take care that the stitches cannot fall from the narrowing comb. With the left hand draw the 4 working needles to the same height, a little under the edge of the jack, and move the narrowing comb one needle inwards (if the latches of the needles in question should be closed, open them again by means of the work hook), hook the 3 eyelet narrowing comb on the needles, so that the 4th needle gets a second stitch. When the narrowing comb is

rightly hooked on, move it towards the front and at the same time pull the needles up a little, in order that the stitches hanging on it can slip into the needle hooks. If the narrowed stitches have become rather long and difficult to hold in the needle hook, then draw the opposite or next needle. The stitches then draw well together and cannot easily fall off the needle hooks. When this is done, lift the narrowing comb up, and pull down the empty needle. Then repeat this on the back needle bed, turn the carriage to the right, and narrow at left front as well as behind in the same manner. Knit a round or two and repeat the narrowing as before, then knit another round or two and continue the narrowing in the manner described until almost all the needles are empty. Naturally, as the width of knitting is reduced, the weight must be gradually decreased. If the narrowing becomes more difficult or the stitches on the narrowing comb drag too much, it is time to reduce the weight somewhat. Repeat this narrowing until it is perfectly mastered. When this has been accomplished, practise in like manner narrowing in tubular work.

Position for this:

Tensions 1 & 2 on 18, 3 & 4 on „fest“.

Lock levers 1 & 2 up, 3 & 4 down.

Up to now we have learned two kinds of knitting (Plain rounds & 1/1) now we pass to the third kind (Patent or 2/2).

For this purpose, bring all needles, back and front, into operation. Now draw down every 3rd needle at the front. At the back leave one needle at the left, draw down the second, and then every 3rd, as at the front. At the right side also one needle remains.

The position of the needles is now as follows:

The needles marked are not in operation, consequently drawn down.

In order to form the first row, the front needle bed must be moved to pass 1 needle on the back — the racking lever F, (after setting the needles as above), is pushed to the back so that the position of the needles is as follows:

$\begin{array}{cccc} | & * & | & | & * & | & | & * & | & | & * \\ | & & | & | & & | & | & & | & | & \\ | & & | & | & & | & | & & | & | & \end{array}$

Position as in 1/1 — all lock levers in operation (down) all tensions on No. 16.

For the selvage round, locks levers 1 & 2 out of operation, tensions 1 & 2 on 18, 3 & 4 on 0.

After the desired number of rounds for the selvedge rounds, all tensions on 16 (alter those first which are immediately about to draw stitches) all cams in operation, the racking lever to the front.

Do not commence to knit complete stockings, until you have become thoroughly acquainted with the foregoing explanations.

Do not be discouraged by failures at the commencement; knitting with a machine requires patience, and speed only comes gradually. Whoever follows our instructions, however, will soon reach the desired goal and have pleasure in knitting.

Position of locks when using suitable yarn and the machine is provided with round brass tension discs (tension dial plate):

plain class 0-5, tensions 1 & 2 at 19; 3 & 4 at 0, lock levers 3 & 4 down

I-6, " 1 & 2 at 18; 3 & 4 at 0, " " 3 & 4 "

II-7, " 1 & 2 at 17; 3 & 4 at 0, " " 3 & 4 "

III-8, " 1 & 2 at 17; 3 & 4 at 0, " " 3 & 4 "

cardigan work: the same lock position, only tensions 1 & 2, 1-2 degrees lower 3 & 4 must be quite vertical, the finger must therefore on no condition point towards 1, or the stitches break. All four lock levers are in action.

for **1/1 & 2/2** class 0-5, all tensions at 17, all lock levers down

I-6, " " " 16, " " " "

II-7, " " " 15, " " " "

III-8, " " " 14-15, " " " "

When machine provided with straight tensions.

Plain goods

class 0-5, tensions 1 & 2 at 14; 3 & 4 at 0, lock lever 3 & 4 down

I-6, " 1 & 2 at 12-13; 3 & 4 at 0, " " 3 & 4 "

II-7, " 1 & 2 at 12; 3 & 4 at 0, " " 3 & 4 "

III-8, " 1 & 2 at 10; 3 & 4 at 0, " " 3 & 4 "

Cardigan goods: The same position of locks, only tensions 1 & 2 are to be fixed 1-2 lines looser, 3 & 4 are to be placed on line 1. All lock levers are in action.

for **1/1 & 2/2** class 0-5, all tensions at 12, all lock levers down

I-6, " " " 11, " " " "

II-7, " " " 10, " " " "

III-8, " " " 8-9, " " " "

If the yarn is for this position of needles too fine, the tensions are to be placed $\frac{1}{2}$ -2 upward toward 0 as is found necessary. If the yarn is found to be too thick then add $\frac{1}{2}$ -2 lines looser towards 25 at round tensions, or towards 15 when straight tensions.

Instructions

for making ladies plain seamless stockings with 2/2 ribbed top.

Bring all 4 lock-levers into operation (down) and at the back and at the front 69 needles each, i. e. from the middle (o) to the right and left 34 & 35 respectively through pushing up the needle springs in working position, first on the front side, then on the back. At the front, every third needle is drawn down: at the back, at the right and at the left there is one needle over, and at the left the second needle is drawn down then every third needle.

The position of the needles is as follows:

| * || * || * || * || * || * || * ||
|| * || * || * || * || * || * ||

Now bring the racking lever, (which before setting the needles stands in front as usual) to the back, in order that the other needle bed can be moved one needle and the needle position necessary for the setting up obtained. All lock levers in operation, tensions 1 & 2 on 18, 3 on 10 and 4 on „fest“. After making sure that all needles latches are open, thread, and turn from right to left, insert set-up comb through the stitches formed and put the weights on, thread the tension spring lift lock levers 1 & 2 out of operation, tension 3 on „fest“ and do 5 or 7 rounds for the selvedge. Then move the racking lever to the front and all 4 lock-levers, down into work; put all tensions on No. 16 and do 20 rounds in 2/2. Then take another coloured thread, as much a contrast as possible, and knit with that instead of the previous material (of which leave about 4 inches hanging down) two or three rounds more. (This other coloured knitting, serves as a guide to facilitate rehooking the stitches on the needles). Break the cotton, hold the comb with the left hand and move the handle, so that the knitting removes itself from the machine. The rib-top so worked will now be put in the machine again, and the stocking proceeded with in plain rounds — seamless.

Bring into work 42 needles on each side, open the needle bed by pulling the eccentric lever G downward, take the 1 needle narrowing comb in the hand, pass the rib-top underneath up through the bed, and begin behind at the left with the picking up of the stitches. The needle latches should of course all be opened. Put the narrowing comb through the left ribbed top stitch, i. e. the last stitch knitted before using the different coloured cotton. Then with the left hand stretch the top part somewhat to the right,



in order that the stitches of the top can be put on the needles one after another, which is made considerably easier by the coloured knitting. Leave every tenth stitch free, that is, do not pick it up, as we have several more stitches in the top than we have needles brought into working position. These few stitches are caught up later. In order not to allow the stitches to slip from the needles again, hang the pear-weight on. When all the back stitches are picked up, go on in the same way with the second half on the front row, hooking on the stitches from the right to the left. When all the stitches are picked up, then take off pear weight and attach buckle 219 (see end of book) and hang weight on it. Press the toothed part of buckle 219 a little from the wire, and, holding the loop upwards, pass the work between the toothed part (front) and wire (back). Then turn the buckle down in order that the work may be trapped, and hang the weight on the loop of the buckle. If the work is too long and the weight touches the ground, then take the weight off and raise the buckle up. The other coloured knitting should now be unravelled, which is easily done by pulling the thread lightly. If in doing this a few should slip from the needles, put them back on the needles by means of the hook or the one eyelet narrowing comb. Hang the stitches remaining free on the next needles. Eccentric lever up, so that the machine bed is again closed. Distribute the weight by regulating the buckle evenly. (See if any of the drawn-down needles have moved out of place). The carriage should be at the left, and if this is not so, put all lock levers out of operation and turn to the left. Now lock levers 3 & 4 in work, tensions 1 & 2 on 18, 3 & 4 on „fest“. Thread and tie the two ends fast together. Do about 65 rounds, (or more or less according to the thickness of the material). The carriage is at the right (in making out our tables we have taken the 18/4 fold stocking yarn generally used for class 1 machines). Now take the 3 eyelet narrowing comb in hand and narrow at left in the way as explained, back and front, one needle. The needles which have become empty to be drawn down. After 5 rounds, in a similar manner, further narrowings follow, always on the left side, in all, 12 narrowings. After a further 32 rounds take the 4 transfer combs in the hand. Take the sheaths from the transfer combs, and put on each of the four, $1\frac{1}{4}$, i. e. 16 stitches, in such a manner that first at the back and then at the front 2 combs are hooked in the needles which are in working position, the combs draw upwards with the needles, so that the latches of the needles slip through the stitches, and afterwards by pushing back over the closing latches slip onto the transfer comb eyelets. Place the sheath on to the transfer comb eyelets, in order that the stitches may not slip from this again and repeat front as well as back. The leg of the stocking should now be turned round one-fourth, in order that the seam and narrowed part of the calf comes in the middle at the back. Open then the needle bed and re-transfer the stitches in the machine again. First taking off the sheath, place the eyelets of these combs on the corresponding

number of needles, and let the stitches slip on the needles, as when narrowing. If it seems more convenient, instead of turning the work round, another coloured strip (2 or 3 rounds) can be done, and the work then taken out of the machine. Hold the stocking leg so that the narrowing comes at the back in the middle of the machine. The work is then, as described above for ribbed tops, picked up again. There are no stitches to be missed here as the number of needles and the number of stitches remain the same. The stripe is then unravelled in the known way. We now proceed to the

knitting of the foot,

for which purpose we put the front lock out of action consequently lock levers 1 & 4 up 2 & 3 down, tensions 1 & 4 on 0, 2 & 3 on No. 17. The carriage must be to the left, and if this is not so raise the back lock levers turn to the left without knitting. Thread the machine and knit $15\frac{1}{2}$ rounds (backwards and forwards) for the heel. In order to cause the work to descend, the triangle 220 (see end of book), which is inserted after the second row and fasten sufficient weight to it. In the middle at back hang the pear-weight as high as possible, and perhaps assist the pulling off a little with the left hand by gripping the work between finger and thumb. Turn the carriage to the right and take the heel comb in the left hand, in such a way that it can easily be laid over top edge of front needle bed (toothed part of the needle bed) and the point of the wire pointing towards the center of bed. At the back we have 30 stitches, and these we divide in about 3 parts. Beginning at the left, 7 stitches, one after the other, are placed on the wire of the heel comb at the front, which is bent a little at the point, the eighth stitch is placed on the ninth needle and the 8 needles which have thus become empty are drawn down. Turn to the left and place at the right 7 stitches onto the right heel comb, the eighth on the 9th needle and draw the empty needles down. Now turn again to the right, take the last stitch from the heel comb and but it on the left end needle in working position, turn to the left and at the right put the last stitch on the right end needle, turn again to the right and at the left put the next stitch on the left end needle, turn to the left and at the right put the next stitch on the right end needle. Continue in this manner, until gradually from the right and left all the stitches from the heel comb are placed on the left and right end needles. The handle is at the left. Now open the front needle bed and take out the weight and heel wire. Push up into action the 8 needles drawn down at the right by pushing up the needle spring, and also push three further needles up; also 3 more needles into working position on the front side. The latches of the needles pushed up must all be opened, so that the needle hooks will be free. Now take the work hook or the **one eyelet narrowing comb**, with the left hand hold the right hand selvedge, and hook the first loop (not the long loose loop but the firm little knot) on the last right hand stitch, the second even stitch on the innermost needle

which has been pushed up, the third loop on the second and so on, until all the loops have been hooked on to the empty needles. Then change the locks again to plain lock levers 1 & 2 up out of operation, 3 & 4 down in operation; tensions 1 & 2 on 18, 3 & 4 on fest) close the needle bed and turn the handle towards the right, the left hand, pulling the work down a little, in order that the needles knit well. On the left side the 8 needles which were drawn down are again pushed up, and 3 more needles at the back and front. Open all needles latches and the front bed, at the left exactly as before at the right, the first loop on the outermost working needle, then hook a loop on each further needle to the left, until here also all the loops are hooked on to the empty needles. Close the bed, hang the buckle and weight on and proceed. The instep should now be done, which is done by putting the 3 needles pushed up on each side gradually out of operation by narrowing.

Knit 4 rounds, the carriage is at the left. Take the 3 eyelet narrowing comb and narrow at the right front the three needles one needle towards the inside, so that the fourth needle has a double stitch. Draw down the empty needle turn to the right and narrow also left front one stitch to the inside with the **3 eyelet narrowing comb**, so that the third stitch comes on the fourth needle. Draw down the empty needle and knit four rounds more, including the already knitted half round, so that the carriage is again to the left. Now take the **2 eyelet narrowing comb** and narrow to the right, one needle to the inside, so that the second stitch comes on the third needle. The outside back stitch is now transferred to the front on the needle which is empty, pull down the empty needle at back. Turn to the right, narrow also at the left with the 2 eyelet narrowing comb one needle to the inside, transfer the back end stitch on the front empty needle and draw down the empty needle at front. Then follows 4 rounds including the already knitted half round. Now narrow at the right by one needle with the 2 eyelet narrowing comb, exactly as before, to the inside, and draw down the empty needle, turn to the right, and proceed at the left in the same manner as at the right. Now knit altogether another 4 rounds, so that the handle comes to the left, and take the one eyelet narrowing comb, narrow one needle to the inside, transfer from, the back end stitch on to the front empty needle, and draw down the empty needle at the back. Turn to the right, and to the left in the same way as given above for this right. After 4 rounds narrow again at the front with the one eyelet narrowing comb one needle to the inside, and draw down the empty needle at the front, turn to the right, and do the left in the same manner. Knit 4 rounds, so that the handle comes to the left, and transfer the end stitch from back to the front corner needle. Drawn down the empty needle: turn to the right, transfer also the left the stitch from the back corner needle to the front corner needle and draw down the empty needle.

Now knit 34-36 rounds for the middle part of the foot after which the knitting of the toe part is commenced, and for this pur-

pose, if the carriage is to the left, narrow by one needle, at the right, back as well as front corner, by means of the **three eyelet narrowing comb**. Draw down the empty needles. Turn to the right and proceed at the left in the same manner, and knit three rounds including the half round knitted. Then proceed at the right behind also at the front, turn to the right and proceed at the left in the same manner (do not forget to draw down the empty needles) knit 3 rounds and narrow as before — right as well as left — knit 3 rounds and decrease as before. We have narrowed three times at each side with three rounds between. The narrowing is continued as before, but now only two rounds between and 5 times in all. Then narrow after each round, that is, at the right when the carriage is at the left and at the left when the carriage is at the right, so that at last, back and front, only one needle remains: then take the stitch from behind on to the front needle, draw down the last empty needle and knit over several times, after which the finished stocking can be taken out of the machine. The weights must of course be gradually decreased according to the decrease of the working width. The 2/2 top is now stitched together with a darning needle, with wool as used for the stocking, and the end of the wool (drawn in fastened) at the point of the toe by means of a machine or darning needle.

Ladies' Stocking with 1/1 ribbed leg.

On each side are 58 needles, viz 1/1 29 each side of the middle, to be pushed up into working position. All lock levers in operation (down). Tension 1 & 2 on 18, 3 on 10, 4 on fest (0). Turn round carefully once, to open all the needle latches. The carriage is at the right: racking lever at the front. The yarn must be threaded in the known manner through the top part of the bobbin stand, through the eye in the yarn guide bridge, then through the V shaped eyelet and the swing yarn lever. Hold the end of the thread with the left hand and turn to the left, insert the setting up comb and attach the weight. At the right hand side fasten the end of the thread between the weights, put the yarn through the tension spring. Lock levers 1 & 2 up, out of operation, Tension No. 3 on „fest“ (0). The machine is now set for plain knitting and seven rounds of this are done for the selvage. The handle is again to the left: put all lock levers into operation (down). Set tensions

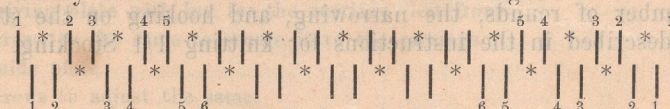
2 & 4 on 16, turn to the right and here also set tensions 1 & 3 on 16. The machine now works 1 & 1 rib. Knit in this way 52 rounds, then take the 3 eyelet narrowing comb in the hand and narrow to the right and work at the left in the same manner. After 3 rounds more the same narrowing follows altogether, with 3 rounds between. The narrowings are followed by 17 rounds and a few rounds of an other colour, after which the leg is taken out of the machine. The leg must now be re-hooked onto the needles in such a way that further plain rounds and then the heel and foot can be worked. Push up a total of 54 needles into operation, all needle latches opened, the front needle bed let down for more convenient operating. The leg must now be hooked onto the needles in such a manner that the two ends meet again at the centre of the back, so that the leg seam lies behind the calf. With the left hand hold the stocking leg up between the beds, so that with the right hand by means of the one eyelet narrowing comb the last stitch before the coloured knitting can be hooked on the back middle needle. To the left all the stitches are now gradually hooked on. In the I/I leg we had at last about $1/3$ needles more in work, and these corresponding number of extra stitches must be distributed on the available number of needles, but on the back row only. We have taken 54 needles, 27 on each side, and 26 stitches remain over (to the right) and to the left at the back 13 stitches each to still hook on consequently there are two stitches behind each needle). The stitches struck off at the back therefore have only to be hooked on, whilst those struck off to the front remain free. Arrived at the left, we also hook on, stitch by stitch, beginning at the left, on to the front row of needles, and lastly the right half of the back, row of needles, therefore again, as formerly to the left, every second stitch is hooked on. When hooking on the stitches, the needles must not be drawn too far up, or the stitches will slip below the needle latches. When a row of stitches have been hooked on, hang some weight on the place required, and press the needles back with the thumb level with tops of needle beds, so that they will not be in the way when hooking on the other rows of needles. The coloured knitting has now to be unravelled, and the stitches remaining free hooked on the back row of needles. Close the bed again. The carriage to the left, and if it is not so, raise all lock levers and turn the carriage idle to the left. On the left lower lock levers 3 & 4 in action, raise 1 & 2, tension 1 & 2 et 18, 3 & 4 at fest. Hold the thread with the left hand and turn carefully to the right. If in the first row, the needles slip through the stitches with difficulty press the stitches below the latches with the flat part of the narrowing comb. The loose thread should be knitted in, and for this purpose hold about the end of thread (which is about 2 inches long) over the latch opener in such a way that the needles can grasp the thread at the same time. Draw up the thread end in the middle and knit it in the same way. After about 5-10 rounds the heel begins in the manner already described on Page 17 and following pages.

The needles and stitches now stand as follows:
 58 needles on each side commenced in the 1/1 leg,
 that is, total 116 needles
 narrowed each side back and front $9 \times 4 = 36$ „
 80 needles remain
 from which $1/3 = 26$ stitches.

54 needles — 27 on each side — are for the plain rounds of the foot, and the remaining third, 26 stitches are to be divided on the back side, from the middle to the right and left, 13 stitches each, so that at the back each needle gets two stitches.

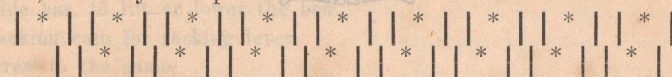
Larger Ladies' Stocking with 2/2 ribbed leg.

Push up 80 needles into action on the front side, that is from the middle, 40 to the right and 40 to the left, on the back push up 81 needles so that at each end there is one needle over. Now, with the handle point of the narrowing comb, draw down at the front every third needle out of working position, so that now only 27 pairs of needles, i. e. 54 needles remain up. At the back draw down to the left first the second needle, then ever third needle as at the front: finally there is one needle over at the right



The places marked * represent needle drawn down.

The carriage is at the right. All lock levers down in operation, in order that all the latches may be opened turn once slowly round. Set tensions 1 & 2 on 18, 3 on 10, 4 on „fest“, the racking lever to the back, whereby the position of the needles is as follows:



Places marked * represent needles drawn down.

Thread and turn to the left. Insert comb, weight and thread tension spring. Lock levers 1 & 2 up out of operation, tension No. 3 on fest. Knit 7 rounds for the selvedge. The handle is at the left. Bring the racking lever to the front, so that the position of the needles are as first described. All lock levers down in operation: tensions 3 & 4 on 16, handle at the right and here set tension 1 & 3 on 16. In this position work 52 rounds and leave the handle again at the left. Now take in hand the two 2/2 narrowing combs

No. 228, and put one of them, holding it with the right hand, so that it will lie in front with the narrowing comb eyelets in the hooks of needles 1, 2 & 3 right hand front corner. Now hold the second narrowing comb with the left hand so that the three left eyelets are placed on the hooks of the needles 1, 2 and 3 right hand back corner. Now draw both narrowing combs quite high, so that the stitches slip below the latches, then push them down again so that the stitches can slip over the closing needle latches on the narrowing combs. Unhook the narrowing combs, and move both of them so towards the centre that the foremost narrowing comb lies on the needles 3, 4, 5 & 6 and the back narrowing comb on the needles 3, 4 & 5. Let the stitches from the narrowing combs slip on the needles mentioned, and draw down at the front and back the empty needles 1 & 2 turn to the right and do the left in the same manner. Knit 12 rounds and narrow again as just described. (Not forgetting to draw down the empty needles.) Altogether there will be 3 narrowings with 12 rounds between each. After the last narrowing, knit another 17 rounds, take another coloured thread and knit a few more rounds with same, then take the stocking leg out of the machine. The leg should be hooked on to the needles again a few plain rounds knitted and then the heel and foot. Have in the middle of the machine, back and front, 28 needles in action, that is, 56 needles altogether. We began with 80 & 81—161 needles, altogether 53 needles where withdrawn, so that 108 remain: $3 \times 8 = 24$ stitches narrowed, and now finally 84 needles remain. We have pushed up 56 needles for plain foot, on the back bed side 28 stitches are to be in action. Each back needle has 2 stitches. The hooking in again is done in just the same manner as described for 1/1 leg; the number of rounds, the narrowing, and hooking on the stitches are as described in the instructions for knitting 1/1 Stocking.



List of sundries.

When ordering new parts it should be stated whether the machine is provided with short or long carriage, ordinary locks with stops or tube lock, further what class of machine and width of needle space, state also the number given on the front latch opener.

No.

1. Left end base casting.
2. Right end base casting with thumbscrew 2a.
3. Crank bracket.
4. Carriage with driving plate and lug No. 12.
5. Iron-table bracket onto which the machine is fastened.
6. Needle bar in needle bed No. 8.
7. Needle spring bar with bar-screws No. 7.
8. Front needle bed with holes for holding wedge blocks No. 34.
9. Back " " " " " screws No. 36.
10. Carriage bearing bar, (front, long) with covering bar and covering bar screws, Screws for securing the bearing bar to the base casting are No. 99.
11. Carriage bearing bar, (back, short) with covering bar and covering bar screws.
12. Driving plate with lug for the carriage (left front).
13. Screws to the same to secure it to the carriage.
14. Guide plate.
15. Screws to adjust the same.
16. Screw for No. 14.
17. Connection washer for the carriage.
18. Screw for same.
19. Rest handle screw.
20. Wooden rest handle for No. 19.
21. Slide bar, to lift or lower the bed.
22. Racking cam for racking lever.
23. Screw to the same.
24. Racking lever.
25. Racking lug.
26. Screw to the same.
- 26a. Excenter lever for lowering of the front needle bed.
27. Excenter spring.
28. " " screw.
29. Excenter-washer.
30. " " screw.
31. Stud in the bed for the excenter.

№

32. Guide stud for regulating bar.
33. Stop pin for racking lever.
34. Wedge block for lowering of the front needle bed.
35. Screw to the same.
36. Screw to fasten the back needle bed.
37. " " " crank bracket to the right fundamental triangle.
38. Crank shaft.
39. Collar for crank shaft with pin 39a for counter.
40. " screw.
41. Lower part of crank.
42. Upper " " "
43. Connecting stud for crank parts.
44. Right crank lug.
45. Connecting lug at carriage end.
46. Handle screw, (machines commencing 35 cm require a specially long screw with nut)
47. Wooden handle (short machines up to 30 cm; long for wider machines.)
48. Crank rod.
49. Lock nut for crank rod.
50. Screw for connecting lug.
51. Bed steady pin.
52. Excenter for stitch lock No. 60.
53. Pointer for the same.
54. Thumb nut to the same.
55. " screw to the same (machines of 35 cm have wing screw).
56. Tension dial plate.
57. " " " screw.
58. Lock plate.
59. Screw to fasten cam plate to the carriage
60. Front right side stitch lock No. 1 (machines commencing of 35 cm require No. 66)
61. " left " " " No. 4
62. Back " " " " No. 2
63. " right " " " No. 3 (as stitch lock No. 1).
64. Guide block for stitch locks on cam plate.
65. Screw to fasten the stitch locks to the cam plate.
66. Moveable stitch lock with wide slot.
67. Spring to the same.
68. Screw to fasten the spring.
69. Spring screw for stitch locks with wide slot.
70. Centre lock piece No. 1 and 2 (i¹).
71. " " " " 3 " 5 (i²).
72. Protecting lock for i³.
73. Screw to fasten the same.
74. Steady pin for the same.
75. Centre lock spring.
76. Lever to work the centre locks.
77. Screw for lever No. 76.
78. Under rest plate for No. 76.

№

79. Screw to the same.
80. Stop screw for centre lock lever.
81. Back needle latch opener plate.
82. Screw for same.
83. Bracket for the back needle latch opener.
84. Screw with flat top for same.
85. Back needle latch opener.
86. Swing yarn guide lever.
87. Yarn guide.
88. Yarn guide screw.
89. Yarn guide bridge.
90. Top screw for yarn guide.
91. Lower " " " " with half long thread.
92. Tension spring (short for 16 to 30 cm machines, longer for bigger machines.)
93. Regulating button.
94. Spring washer for same.
95. Screw to fasten the tension button to yarn guide bridge.
96. Set screw in tension button.
97. V Shaped eyelet (screw to the same No. 56).
98. Front needle latch opener plate.
99. Screw with round top to fasten the same.
100. Steady pin for No. 98.
101. Needle latch Bracket.
102. " " opener (screw No. 88 for the same).
103. Left friction rod bracket long.
104. Right " " " "
105. Screw for No. 103 and 104.
106. Friction rod.
107. Friction block case for plate with stud.
108. " " plate with stud.
109. " " spring with big hole for plate and stud.
110. " " case with thread for screw.
111. " " plate for screw.
112. Friction block spring for screw.

Counter II.

114. Counter-case (state if for machine with short or long carriage).
115. Screws to fasten counter case to the crank bracket.
116. Interior counter spring.
117. Screw for the same.
118. Bar for counter with screw 118a.
119. Movement lever.
120. Screw for movement lever.
121. Dial.
122. Spring (plate) for dial.
123. Screw to fasten dial to the fundament.
124. Pawl with screw 124a.
125. Spring to the same.



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126. Check pawl (right) as No. 124 with screw 124 a.
127. Spring to the same.
128. Finger for clock.
129. Screw to the same.
130. Stud for No. 121.

New lever counter for shaft collar No. 142.

131. Clock fundament (state if for machine with long or short carriage)
132. Spring for under dial (plate No. 121).
133. Movement lever.
134. Tension spring for starting lever.
135. Screws for spring.
136. Pawl.
137. Connecting screw for pawl.
138. Spring for pawl.
139. Screw for spring is No. 135.
140. Washer for dial.
141. Screw to the same.
142. Shaft collar with projection.
143. Stud for adjusting counter dial.
144. Counter finger with screw 135.
145. Fastening screw for counter fundament.
146. Latch needle.
147. Narrowing comb eyelet.
148. Needle spring.
149. Fundament for bobbin-stand.
150. Bobbin stand top part.
151. " " " " with tension spring.
152. Back brush-holder.
153. Front " "
154. Screw to the same.
155. Brushes.

Parts differing at machines with long carriage.

156. Right fundament casting for machines of commencing 30 cm.
157. Left " " " " 30 cm.
158. " " " " " 16 to 27 cm broad.
159. Right " " " " 16 to 27 cm "
160. Carriage cap (state if right or left).
161. Under plate for No. 160.
162. Screw to carriage cap.
163. Friction rod bracket (right or left)
164. Screw to the same.
165. Steady pin for carriage cap.
166. " " " " friction rod bracket.
167. Carriage bearing bar.
168. Screws to fasten the same.
169. Interior plate for sliding centre lock.

№

170. Interior moveable stop.
171. Moveable slide with stud for No. 170.
172. Thumb-screw for the same.
173. Connecting screw No. 170.
174. Spring for No. 170.
175. Outside stop, right front and left back.
176. " " " " right back and left front.
177. Latch for bolt, right front and left front.
178. " " " " " " " " "
179. Carriage stud.
180. Latch stud.
181. Stop screw.

Sliding locks.

182. Cam plate.
183. Centre lock piece.
184. Plate for No. 183 with brass washer 184 and screw 135.
185. Spring for centre lock No. 183.
186. Spring washer for centre cam locks.
187. Screw for centre lock.
188. Washer for centre lock.
189. Screw to the same.

Hinged tube locks.

190. Lock plate.
191. Plate No. 192 and 193.
192. Left plate for hinged lock.
193. Right " " " " with end projection.
194. Screw to fasten parts 198 & 199.
195. Left hing spring.
196. Right " "
- Screw to fasten the stitch locks to cam-plate, 65.
198. Left hinged lock (large No. 3 & 4 = iI).
199. Right " " (small No. 1 & 2 = iII).
200. Screw for same.
201. Steady stud in the plates No. 192 & 193.
202. Protecting lock.
203. Front screw for 202.
204. Back " " 202.
205. Spring for 202.
206. Screw for 205.
207. Stitch lock screw No. 65.
208. Stitch lock guide block under No. 207 = 64.
209. Left slide for starting 198.
210. Right " " " 199.
211. Screws to the same.
212. Springs to the same.
213. Spring for moveable stitch lock with wide opening for machines from 32 cm and wider!



N^o

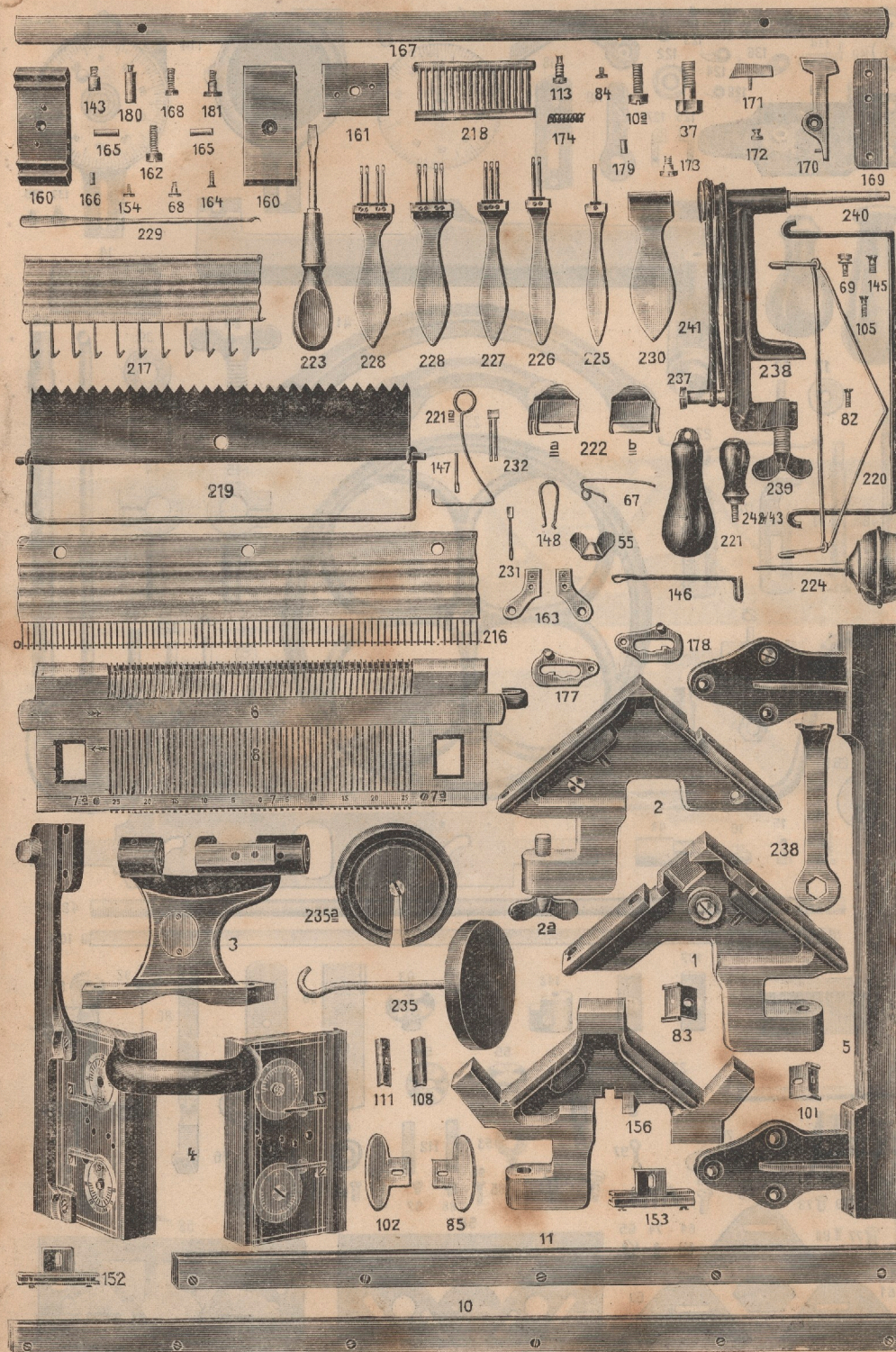
214. Right side stitch lock with screw No. 65 and block 64.
 215. Left ditto.
 215a. Screw for spring for movable stitch lock.

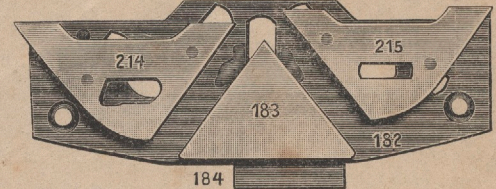
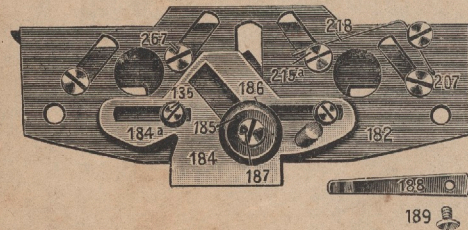
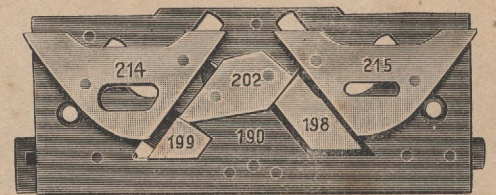
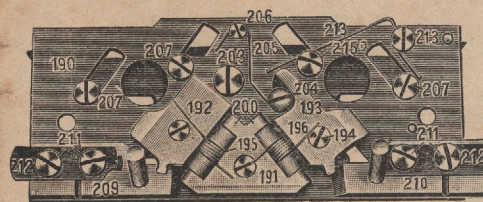
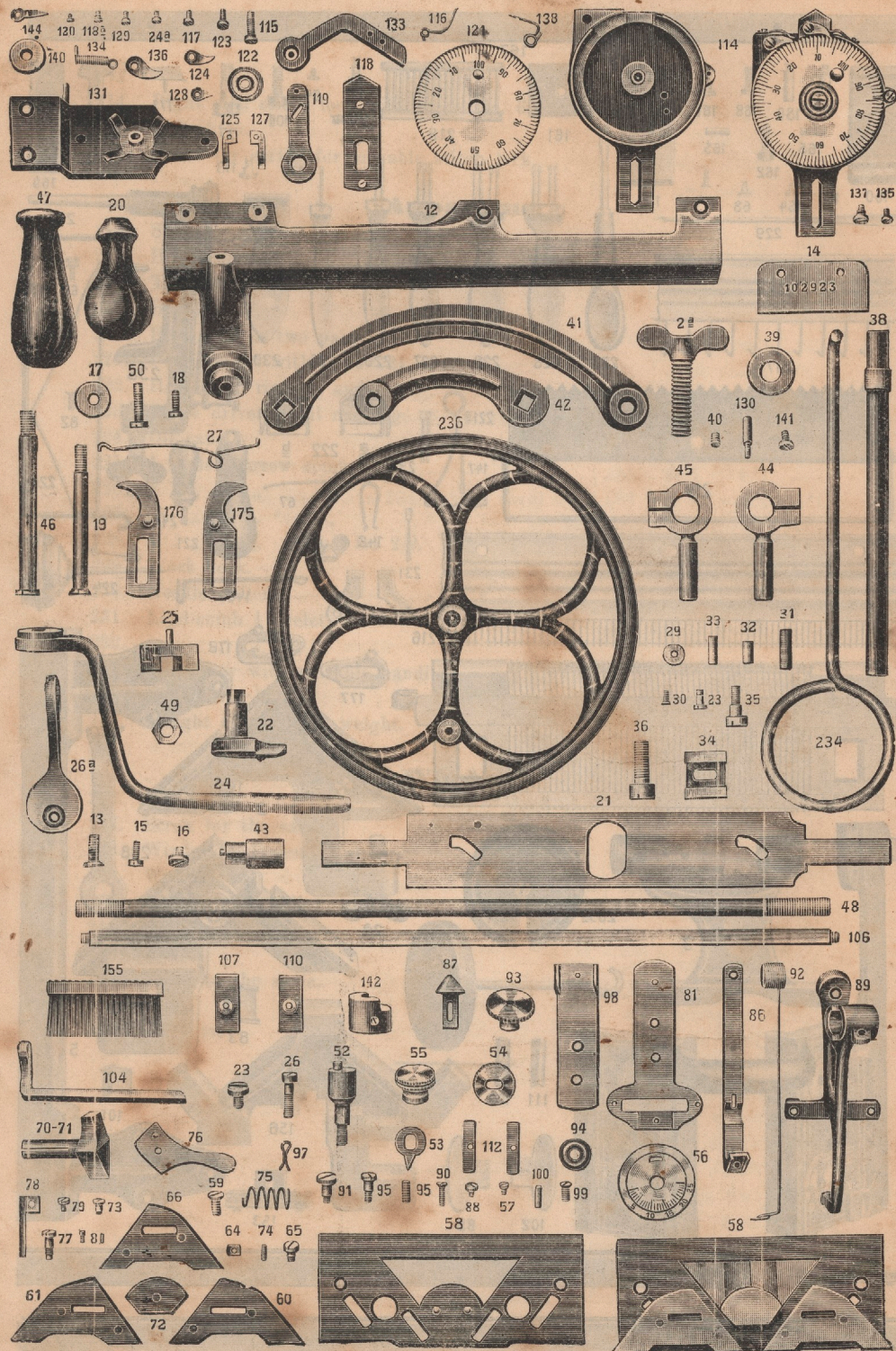
Apparatus.

216. Set up comb with wire.
 217. Hook comb.
 218. Transfer comb.
 219. Buckle.
 220. Heel wire in two parts.
 221. Pear weight with hook 221.
 222. Heel comb right a and left b.
 223. Screw driver small and big.
 224. Oil can.
 225. 1 eyelet narrow comb.
 226. 2 " " "
 227. 3 " " "
 228. 4 " " " for 2/2.
 229. Work hook.
 230. Needle puller.
 231. Lead-comb 1 eyelet.
 232. " 2 "
 233. Screw key with movable handle.
 234. Needle bar hook.
 235. Weight carrier with weight.

Winder.

236. Wheel.
 237. Screw for the same.
 238. Winder fundament.
 239. Wing screw.
 240. Spindel with pulley.
 241. Strap.
 242. Handle.
 243. Screw to the same.
 244. Swift.
 245. Swift foot.





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WONDERFUL SEWING MACHINES



HAPSBURG PIANOS.
ELECTRA CYCLES.



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