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BOOK ON RING SPINNING \*\*\*

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**INSTRUCTION BOOK**  
**ON**  
**RING SPINNING**  
**BY**  
**FRANCIS L. LINCOLN.**

**WARREN, MASS.**  
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## **PREFACE.**

The object of this little book is to give help and instruction to those who are engaged in this department of mill work. It imparts that knowledge which only years of thorough study and observation can give. It has been carefully prepared by an experienced Spinner, who has given years of study to it, in order to benefit and help those who are interested in the Spinning department.

FRANCIS L. LINCOLN, Author.

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## **INSTRUCTION BOOK.**

### **THE FIRST THING.**

1. The first thing to do when going into a strange room to take charge, is to learn the names and dispositions of your help, and their ability. By doing this it will save you some trouble. Do not turn off help the first day you go into a room to take charge. Get the good will of your help and keep them; and when they learn your ways and know you mean just what you say, every thing will be pleasant for them and you also.

### **DRAUGHTS, TWISTS AND TRAVELERS.**

2. To see that your Draughts, Twists and Travelers are right for the numbers of yarns you are spinning. Travelers govern the twist. When the bobbins are full there is more twist in than when it first starts. Have them heavy enough to keep the ends straight. If Travelers are poor the work will run bad. Change them on fine work once in three or four months, clean them every doff, and touch the ring with a little oily waste. If Draught gears bind, spinners cannot keep their ends up.

[8]

## **PACKING YARN ON BOBBINS.**

3. To see that the yarn is packed closely on the bobbin. The way to tell is to put an empty bobbin on, and run one layer of yarn upon it; if the threads do not lay close together, run your motion slower. In this way you get more length of yarn to the bobbin.

## **THREAD GUIDES.**

4. To see that your thread guides are central with the bobbin below. If a crease has been made by the thread running through it, take it out and put in a new one.

## **SPINDLES.**

5. To see that the spindles are in the center of the rings, and that your rings are in good condition. A poor ring will make two-thirds more waste than a good one, and the frame requires three times the cleaning that it does with a good ring. Slip your finger round inside of the ring; if it feels notchy the ring is poor. Take it out. Rings should be looked over every time you scour. That should be every six months. Steel rolls should be rubbed with one-twenty emery cloth once a year, with a little oil.

## **TOP ROLLS.**

6. See that your top rolls are kept in good condition. Look them all over once a month if that will do, if not look them over oftener. New rolls should always be put in the front, poorest ones in the back. New rolls should always be calipered at each end; if they do not caliper the same at each end of the roll, the roll should not be used, as it would spoil the yarn, and spinners could not keep up their ends. New rolls should be oiled when they are put in to run. Neck of front rolls should be oiled morning and noon. All of the rolls should be oiled once a week. The weight should be the same on all top rolls. In order to do this your saddles must be all alike, and must not hug the neck of the roll. Stirrups should be all of the same length and style. The levers should be all of the same length and style; and weights should be all of the same heft. Stirrups must clear the rolls, and use double saddles. Shell rolls should be cleaned and oiled once a month, with lard oil. Use vinegar with one-third water to clean top rolls. Roller hooks should not be used on steel rolls.

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## **CARRYING.**

7. A small band carrying one spindle is better than a large band carrying a number of spindles. It makes better yarn, and not one-third the waste. Bands should be put on tight; and the spinner should call the band boy soon as one comes off, to put on a new one. Bands should all be looked over once a week, and all slack ones cut off and new ones put on. A slack band makes soft yarn. If your frame does not run up to speed, you will get soft yarn. A dry spindle will also make soft yarn. Keep your spindles properly oiled.

[10]

## **LONG STAPLE COTTON.**

8. For long staple cotton you must spread the bottom and top rolls a little to avoid cockley yarn. Long staple cotton does not require so much twist on spinning as short.

## **ROVING.**

9. Too much twist in roving makes bad yarn, and spoils the top rolls on spinning frames. The square root of the number is about the twist for roving. It gives the Carder a chance to keep up with the spinning, and

gives the Spinner a chance to make a better quality of yarn. If there is too much twist in the roving, you cannot draw it on spinning frames without spreading the rolls; but then it will spoil the top rolls. Keep your numbers even if you can. Size from every fine speeder and average it every day, and examine the yarn every time you size, to see if it is good. By doing so it may save you considerable trouble.

### **TWO-ROVING.**

10. In running two-roving together, always have them of the same hank, because if one is of one hank, and the other of another, there will be more twist in one than in the other, and will not make as good yarn, and will not draw as even as they would if they were of the same twist or hank. To know what the two hanks would be single; you must add the two hanks together, and divide that by four to get it single.

[11]

### **DOUBLE WORK.**

11. The way to run double work on spinning frames. Have the white put in the top, if you have double creels; and colored work in the bottom. Piece the back roving in the top with the back roving in the bottom. Front in with front makes the yarn more even.

### **WASTE.**

12. Waste must be run through the lapper all by itself, not mix it with the good cotton; and if one section of cards will run one lap a day and keep the waste up, you may run one; if it makes two laps put on two sections, (one lap on each section,) and the work or yarn will be more even.

### **UNEVEN WORK.**

13. How to prove that uneven work is not made on spinning frames. See that your draught gears do not bind; if they do, you will have uneven yarn. Put in new rolls in front, middle and back. See that your frame runs up to right speed and roller belt is tight. See that the rings and travelers are good. See that stirrups and saddles are in place. Then if your yarn is uneven the trouble is in the carding room. Roving bobbins should be marked for each speeder; and the spinner run each separate on his frames. Then if you had bad work you could tell very quick which speeder it belonged to.

[12]

### **BUNCHES.**

14. How bunches can be made on spinning frames. By piecing on roving and leaving the end to run through double. By piecing up ends and not twisting on smoothly. By wiping out the roving rack and the waste catching on the roving and running through the rolls. By wiping off thread-boards, waste catching on to the ends and spinning. By rolls not being kept clean and oiled. By spinners not being careful enough when they clean their rolls. By spinners brushing and cleaning their frames. By brushing down over head. By spinners not keeping their clearers clean. The carder should be just as particular about making his roving as the spinner is about making his yarn; then there will be good work all through. A dry front roll will make bunches on spinning frames, and will do the same on speeders. Sweepers should not blow their waste under the frames. Bunches can be made on spoolers by thread guides not being wide enough for the threads to pass through. A bunch will collect and stop the spool. Spooler tenders lift it over on to the spool.

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### **COARSE THREADS.**

15. How coarse threads are made. First, by coarse roving; second by

spinners letting two roving run through the guide; third, by one end catching on to another and running on to the bobbin; fourth, sometimes where there is two ends on one boss, one end will break and catch onto the other and spin. If the trouble is in the spinning, you untwist the thread and you will find two threads instead of one. If not two threads, the trouble is in the carding room.

### **CHANGING NUMBERS.**

16. When you change from one number to another see that the motion runs right to pack the yarn closely on the bobbin; then have your travelers just heavy enough to keep the ends straight. By running a heavy traveler you pack the yarn harder on the bobbin. I do not believe in running a traveler heavy enough to pull down the ends, but heavy enough to keep the ends straight.

### **POOR COTTON.**

17. When cotton is poor you may need a little more twist in the yarn; sometimes when cotton is poor, the warp spinning will run bad. In this case you may run your warp one number heavier and mule filling one number lighter. Waste work requires more twist than good cotton.

[14]

### **ECONOMY OF HEAVY TRAVELERS.**

18. It is cheaper for the company to run heavy travelers, and wind the yarn hard on the bobbins and spools. You get more length of yarn and a better quality. Will not cost so much for spooling.

### **KNITTED YARN.**

19. If the yarn is knitted the trouble is in the carding room, as you cannot make knitted yarn on spinning frames.

### **SNARLED YARN.**

20. How snarled yarn is made. By spinners not finding the end and breaking a thread on the bobbin to piece up by. By having the taper shorter on top of the bobbin than on the bottom, so when the doffers take the full bobbins off, the thread pulls over the top and snarls. To avoid the above, lower the arm where it is attached to the frame, (the arm that the heart rider is attached to). About one-quarter of an inch will be enough. You want the taper longer at the top than at the bottom.

### **LAP WASTE.**

[15]

21. How to avoid making lap waste in spinning room. By keeping spinners where their work is, and by not giving spinners any more work than they can keep up. By having good doffers and good starters. If doffers and starters are not good they will make more waste than their wages will come to. Doffers should wind the thread four times around the bobbin. Starters should not wind on to bobbins when there is yarn on to piece up by.

### **ROVING WASTE.**

22. How to avoid making roving waste in spinning room. By letting it all run through the rolls into yarn. All bad roving should be sent back into the carding room, where it belongs, every day.

### **PICKING UP WASTES.**

23. All wastes should be picked up, looked over, weighed and carried off where it belongs, every day. You will find it much better than the old way. Not so apt to accumulate.

### COLORED WORK.

24. Colored work always runs heavy. You want one tooth less draught change gear than your hank roving figures for. But put in the same twist.

[16]

### DOFFING.

25. System in doffing the frames. To save making waste and trouble in the room, doff every other row right through, then go back and doff the remaining rows through. In doffing this way the spinners can tend more sides and not make so much waste, as any spinner knows, or ought to know. Frames run better when half full than on an empty bobbin. One frame stopped at a time to doff, is all that ought to be permitted. From three to four minutes is long enough time to doff any frame with four doffers. The first frame should be filled to a gauge astride the bobbin. Do not go by the clock, as the yarn is sometimes heavy. This gauge is the best guide I ever had in doffing.

### SPEED OF CYLINDER.

26. How to get speed of cylinder. See what main line runs; then get diameter of counter pulley that carries the cylinder below. The pulley above is called a driver. Then multiply the speed of main line by diameter of counter pulley that carries the cylinder, and divide that by the diameter of the pulley that is on the cylinder, which is called the driven. Then to get speed of spindles, get diameter of cylinder, and multiply the speed of cylinder by diameter of cylinder, and divide that by the diameter of the whorl.

[17]

### SPEEDING PULLEYS.

27. To know what pulley will drive your cylinder faster or slower. Multiply the speed you would like to have it run, by diameter of pulley overhead, that carries the cylinder, and divide that by the speed you are now running. Will give you pulley required.

### TAKING UP BELTS.

28. To know how to take up a belt, when you change pulleys. If your belt is tight enough with the pulley you now have on, for every inch that your pulley is smaller than you now have on, take out one inch and three-quarters of belting. If larger, right the reverse.

### TWISTS.

29. To know what number of twists to the inch, for any number of yarn. On warp, multiply the square root of the number by 5. Frame filling by 4, and mule filling by  $3\frac{1}{4}$ . For every ten numbers below thirty take away two twist to the inch. For every ten numbers above thirty, add two.

[18]

### SQUARE ROOT.

30. Square Root of numbers from 18 to 30.—These twists are within a fraction.

NUMBERS	SQ ROOT	Warp Twist	Filling Twist

13	3.605	15 per inch	11-½ per inch.
14	3.741	15-½ per inch.	12 per inch.
14	3.741	15-½ per inch.	12 per inch.
18	4.242	19 per inch.	15 per inch.
19	4.359	19-½ per inch.	15 per inch.
20	4.472	20-½ per inch.	15-½ per inch.
21	4.582	21 per inch.	16 per inch.
22	4.690	21-½ per inch.	16-½ per inch.
23	4.796	22 per inch.	17 per inch.
24	4.899	22-½ per inch.	
25	5.000	24 per inch.	19 per inch.
26	5.099	24-½ per inch.	
27	5.196	25 per inch.	19-¾ per inch.
28	5.291	25-½ per inch.	21 per inch.
29	5.385	26 per inch.	
30	5.477	27-½ per inch.	22 per inch.

#### **DRAUGHT FOR YARN.**

31. To know the draught for any number of yarn. Write the number you are spinning or want to spin, add two ciphers to it; divide that by the hank roving that you are spinning from, to get draught. Example; hank roving 225, No. yarn 18. Add two ciphers, (1800); divided by 225 gives 8 draught.

#### **GEAR REQUIRED.**

32. This is the way I was taught to figure draughts of different numbers of yarn. If you want to run another number with the same hank roving, multiply the smallest draught change gear by the number you are spinning, and divide that by the number you want to spin, and that will give you the gear required.

[19]

#### **ROVING REQUIRED.**

33. If you want to spin another number with same draught, write your number that you want to spin (as above) and divide that by the draught. That will give you hank roving required.

#### **TO FIND DRAUGHT CHANGE GEAR.**

34. Rule to find the draught change gear required. When you change from one number to another on a frame or mule, when the draught and roving both have to be changed, multiply the number of the yarn being spun by the hank roving desired, and that product by the number of teeth in the draught change gear; using that for a dividend. Then multiply the number of the yarn desired by the hank roving, using that for a divisor; that product divided will tell the draught change gear that is required.

#### **TWIST GEAR.**

35. The way I was taught to find the twist gear by square root of the



number of yarn. Multiply the twist gear in use by the square root of the number being spun, and divide that product by the square root of the number you want to spin. That will give you the twist gear required.

### TWIST PULLEY.

36. To get the twist pulley for another number of yarn. See what twist the pulley gives that you have on, and multiply the twist that you have in, by the pulley that is on, and divide that product by the twist you would like to put in to get the pulley required.

### TWIST OF YARN.

37. To know how to get the exact twist in yarn. Have your roll belt tight, and band also. Count the revolutions of the spindle to the rollers once. Divide that by the circumference of the roll, which is  $3\frac{14}{100}$  inches. Example. Say 86 turns to the rolls once.  $(3\frac{14}{100})$  86.00 turns,  $(27\frac{38}{100})$  twists to the inch.

### WEIGHT ON TOP ROLLS.

38. To know the weight on top rolls. You must measure the distance from where the stirrup is attached to the lever to where the wire is attached that holds the weight; then multiply the distance by whatever the weight weighs, and divide that product by the exact distance from where the lever is attached to the set screw, to where the stirrup is attached.

### SQUARE ROOT TABLE FOR THE TWIST OF YARNS.

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No. of Yarn	Square Root	No. of Yarn	Square Root	No. of Yarn	Square Root
1	1.000	31	5.567	61	7.810
2	1.414	32	5.656	62	7.874
3	1.732	33	5.744	63	7.937
4	2.000	34	5.830	64	8.000
5	2.236	35	5.916	65	8.062
6	2.449	36	6.000	66	8.124
7	2.645	37	6.082	67	8.185
8	2.828	38	6.164	68	8.246
9	3.000	39	6.244	69	8.306
10	3.162	40	6.324	70	8.366
11	3.316	41	6.403	71	8.426
12	3.464	42	6.480	72	8.485
13	3.605	43	6.557	73	8.544
14	3.741	44	6.633	74	8.602
15	3.872	45	6.708	75	8.660
16	4.000	46	6.782	76	8.717
17	4.123	47	6.855	77	8.774
18	4.242	48	6.928	78	8.831
19	4.358	49	7.000	79	8.888
20	4.472	50	7.071	80	8.944
21	4.582	51	7.141	81	9.000
22	4.690	52	7.211	82	9.055
23	4.795	53	7.280	83	9.110
24	4.898	54	7.348	84	9.165
25	5.000	55	7.416	85	9.219
26	5.099	56	7.483	86	9.273
27	5.196	57	7.549	87	9.327
28	5.291	58	7.615	88	9.380
29	5.385	59	7.681	89	9.433

30	5.477	60	7.745	90	9.486
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☞ If any Spinner purchasing this book has trouble with his work, he will receive aid from me (if in my power) by stating all particulars.

All orders for this book should be addressed to Francis L. Lincoln, P.O. Box 35, Warren, Mass.

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