

The drawing frame is a comparatively simple machine, but I have seen much uneven work made on a drawing frame. I do not refer so much to bad rolls as to improperly working stop motions and bad piecings. As a rule, if a boss carder has help to work in, and they are not skillful enough to work on the cards or speeders, he puts them on the drawing. It is, perhaps, a hard but comparatively simple matter to run drawing, but as all the stock goes through these machines, it is of vital importance that the work should be well done. An improperly working stop motion lets an end run through; a careless operator pieces up the end, but does not take out the single, and you get a variation of sometimes several numbers of yarn, according to the number of doublings and drafts beyond. Perhaps you think they don't do it in your mill, but get where you can watch the drawing tenders unobserved and you may see some one making either singles or doubles. Help watch a superintendent pretty sharply, and when he is around they are full of business. I have seen more or less of it done in our mill and seen it done in other mills, and have seen spinning rooms run very badly in consequence of bad splices on drawing and speeders. There is no mill but what gets some bad work, but some mills get more than others. There will always be careless help, and, perhaps, careless overseers in every mill, and it might not be a bad idea for every superintendent to spend part of his time looking after them. It is not human nature for any overseer to point out his own weak points to the superintendent, so it is quite necessary that the superintendent should be able to judge correctly of the different processes through which his cotton goes. Overseers sometimes, however, labor under disadvantages which should be taken into consideration, and all possible aid should be rendered them to improve the running of their rooms. Give them good tools and proper stock and demand good work. Encourage them all you can; keep them awake to the advancement of the times and interested in their work, and you will generally get the best there is in them; but keep them feeling like whipped curs and they do their work simply from necessity, and no more of it than they are obliged to.

Many of our mills are adopting the large ring and long traverse, and it may not be out of place to say a few words in regard to it. In changing to a large ring and long traverse each one must determine for himself just how far he can go and where to stop. The conditions are so different in different mills that it would be impossible to lay down any fixed law in regard to it. You will all have plenty of opportunity to exercise your skill as spinners before you get everything adjusted right, and it would not be a bad idea to "make haste slowly." I am confident, however, that you will be well satisfied with the results you obtain.

There must be, to begin with, well-prepared roving, and every part of the frame as perfect as possible. The bobbin, of proper diameter, must run perfectly steady

and the rings be perfectly concentric with the spindle at all points of its traverse, and well burnished. It would not be a bad idea to run the ring on a coarser number of yarn than you intend to run ultimately, till the ring gets seasoned, so to speak, and with a good overseer to push it you are ready to save money. You will require no more spinners, and can dispense with some of your doff boys, as there will be less doffing, consequently less cost and an increase in production, as the belt is on the tight pulley longer; less knots to tie in spooling, hence better work, and a large saving in that department. I think I am perfectly safe in saying that any superintendent can guarantee to his treasurer at least 15 per cent. on the cost of changing from small to large rings.

We have in our mill an Excelsior spinning frame built by the Fall River Machine Co., and a description of it and the work produced by it may be of some interest. The frame has 168 spindles,  $2\frac{1}{4}$ -inch ring,  $3\frac{1}{4}$ -inch space,  $7\frac{1}{4}$ -inch traverse, double draft, condenser trumpets between front and middle roll, and an attachment for breaking back the roving whenever an end breaks—invented by the Sampson Cordage Co., of Shirley, Mass. The frame was designed to spin from No. 4 to No. 12 yarn. We had been obliged previous to getting this frame to spin our coarse yarn on a  $1\frac{1}{2}$ -inch and  $1\frac{3}{4}$ -inch ring, which not only made it expensive, but made many knots, which never failed to show themselves, and as at least one-half the breakage of the warp in a loom is caused by knots, it was a very serious matter. On the old-style frame we got about 425 yards of No. 6 yarn on a bobbin and a production of  $6\frac{1}{2}$  pounds per spindle per week. We now get over 1,500 yards on a bobbin and a production of about  $9\frac{1}{2}$  pounds per spindle per week ( $\frac{3}{4}$ -inch front roll, running 196 revolutions per minute); the yarn being of as good quality as that made on the small ring. On No. 12 yarn, however, I have not obtained as good results as at proportionate speed; and as my tests are not complete at this time, I will not say that the frame cannot produce equally as good yarn as the single-draft frame. In order to show the results obtained by me in spinning No. 12 yarn, I have given at the end of this article a test of 120 bobbins of yarn. In conducting this test, I put in my speeders 80 bobbins of .75 hank roving, and made 40 bobbins of 1.80 hank roving. I then put the slubber roving in the Excelsior frame, putting the two bobbins that were together in the slubber together in the frame, and spun 40 bobbins of yarn with the condenser trumpets on the frame. I then took off the condenser trumpets and spun 40 bobbins more. The draft of the frame was 5.8 inches between the front and middle roll, and 5.6 inches between the middle and back roll, making a total of 32.48 inches. The 40 bobbins of 1.80 hank roving I put in our common frame, using a draft of 6.67 inches, the speed of the front roll and the twist being practically alike in all three tests. The cotton used was  $1\frac{1}{4}$ -inch staple, 25 per cent. card waste mixed in. I expect to make further tests, and hope to obtain better results with the Excelsior frame.

The condenser, which is placed between the front