Machinery and Appliances.

IMPROVED CARD.

MESSRS. JOHN HETHERINGTON AND SONS,
VULCAN WORKS, FOLLIED STREET,
MANCHESTER.

We resume our notice of this card, and in doing so may dwell briefly upon a point not brought forward in our last, namely, the method adopted by Messrs. Hetherington to obtain a well-constructed flexible bend, and to restore it after any subsequent wear and tear.

On the importance of having every part of the working surface of a flexible bend exactly concentric with the cylinder it is unnecessary to dilate. The best condition, and we may say the condition essential for securing good work, is that in which the wire of all the flats resting on the bend shall be brought as uniformly close to the wire upon the cylinder as possible without touching, and shall so remain throughout every portion of their traverse over the cylinder. It is equally necessary that this uniform space between the two surfaces should also be maintained throughout the length of the flats, or across the face of the cylinder. Should contact take place at any part the cotton will be tangled; should the space be increased the flat will cease to work at that portion and the cotton will be rolled. This shows the necessity of the bends being constructed and arranged so as to render the course of the flats resting upon them perfectly concentric with the cylinder. This could be readily obtained, but it becomes more difficult when it is found that provision must be made for an adjustment of the relationship of the parts rendered necessary owing to the wearing down of the wire upon both cylinder and flats. This wear requires that the latter shall occasionally be brought nearer to the periphery of the cylinder, which can only be done by reducing the flexible apparatus, consisting chiefly of the milling cutters \( \text{a} \)-one for each bend—and both on the same shaft \( \text{c} \). The cutters are driven from a temporary pulley and the belt \( \text{d} \) through the clutch \( \text{f} \). The toothed segment \( \text{x} \), with the worm and gear on bracket \( \text{o} \), temporarily attached, is regulated by the belts shown. This part of the arrangement is the feeding motion. It turns the cylinder very slowly, and in the course of a few hours the milling cutters will have passed from one end of the bends to the other, accurately tracing them over their whole lengths, taking out all the irregularities due to the uneven springing, buckling, and weight of flats.

For tracing the bends of existing carding engines the milling cutters are carried by an arm (Fig. 3) which is fixed on the shaft \( \text{e} \). The flats are removed, and the apparatus, which cleans all the webs and fixings on the engine, turns up the existing bends in the same accurate manner. The patentees have thus improved a large number of carding engines with revolving flats, enabling them to turn out much better work than formerly.
Having dealt with the leading features of its construction we may now examine an important adjunct for maintaining the perfection of its original condition. This is the grinding apparatus. When the increased attention of which we spoke in our last issue began to be devoted to the card it was soon found that the method of grinding was radically imperfect, because what was called the grinding surface of the flat could never, under any conceivable conditions of the working life of the card, be a duplicate of the working surface. Yet this is exactly what it was bound to be if it had to be placed in the best condition for grinding. Seeing that this could not be obtained and maintained, it soon appeared that the only thing to be done was to devise means of grinding the

line A B, Fig. 5, and it is evident that if no special provision were made, and the flat were pressed against this surface during the grinding, the clothing would be ground, as shown by dotted line X Y, parallel with the line A B, and spoiled by having all the heel taken out. Up to the present it has been customary to prepare a second surface, c d, upon the back of the flat, parallel with the surface of the points of the clothing, and upon these surfaces the flat slides during the grinding. Both the surfaces A B and c d gradually wear, and that inequitably; so that only a few of the flats can be set to the cylinder, and the others are at some distance and cannot be adjusted, and consequently are making imperfect carding. It is thus of the first importance to maintain the relation between the surface A B of the flat and that of the points of the wire clothing absolutely equal in each flat. To arrive at this, however, it is necessary to find a means

of grinding from the surface A B, and at the same time to preserve the angle between this and the surface of the clothing. We have invented and patented the following mechanism, which completely accomplishes this end:

Upon each side of the card are fixed two pieces, m and a, Fig. 6. The piece m is fixed, and the curve on the under side of it corresponds with the curve upon which the flats work while carding; the top portion, m n of the piece m, is formed to a certain angle corresponding with the curve o n, and this part can be regulated up and down according to the wire of the clothing of the flats, without changing the angle formed with the part o n. The bearings of the grinding roller are made to slide upon the surface A B, and the movement is controlled by a cam-wheel of the form required. This cam wheel contains 13 teeth, each tooth utting to the grinding roller 8 flats and the same tooth the same 8 flats continuously and no other. This is a further advantage as it assures absolute uniformity in the grinding of every flat, as in the operation each flat is thus always ground from the same side. The cam wheel referred to above is also a duplicate of the star wheel and acts correspondingly on the grinding roller. As indicated above, the cam wheel acting on a compound lever draws forward the bearings of the grinding roller whilst the flats are travelling backwards, each part thus travelling half the distance of the width of the wire of the flat. The lever holding the flats in position against the piece m is not rigidly held, so that in the
event of any engagement taking place it would yield and prevent breakages.

The firm have also invented a new slow grinding apparatus on the differential principle, which can be applied to any existing mill. It consists of two internal wheels, connected by two spur wheels, one of the internal wheels being held. The spur wheels fit on an eccentric which bears on the spurs into the internals and carries them round the stationary internal wheel, the eccentric being actuated by means of band pulleys from the loose pulley on the cylinder shaft. On the differential wheel is a grooved pulley from which the power is carried back to the band pulley on the cylinder shaft, thereby giving it the slow motion of one to two revolutions per minute. The doffer is driven off the cylinder shaft at the opposite side. The apparatus can be applied and removed in a couple of minutes.

We have now before us a number of the details of this excellent machine, that in combination make it one, which has not only maintained but has considerably enhanced the excellent reputation of the firm for the construction of the best cotton machinery.

Messrs. Hetherington and Sons will no doubt be pleased to answer any inquiries that intending purchasers or other proper persons may make.

**News in Brief**

**ENGLAND**

**Accrington**

The Accrington Spinning Company, Limited, have given the order for the preparatory machinery for their new mill to Messrs. Howard and Hallough; and the order for the mules (10,000 spindles) to Messrs. Platt Bros. and Co., Limited, Oldham.

Mr. J. Hargreaves, late manager for Messrs. S. H. Swift & Co., Limited, has accepted the position of manager for Mr. Richard Pitkin, Shadrack, Shaw, Heasman, and Hargreaves, Lilburn.

The majority of the mills in Ashton and Dukinfield are stopped for the whole of this week for the annual weeks holidays. Last week about 600 spindles received stoppage pay from their local trade (which is stopped for repairs to the engines), and are receiving stoppage pay.

The following are the results of the examination in cotton spinning carried on at the Accrington Mechanics' Institution, held at the Accrington Mechanics' Institute, for the week ending July 31st. A list in connection with the City and Guilds of London Institute, held at the Accrington Mechanics' Institute, for the week ended July 31st, and the examination for the week ended August 1st, and the examination for the week ended August 12th.

**Bradford**

During the holidays of last week several firms took advantage of the 'Pent' stoppage, which extends from Saturday noon till Wednesday morning, to thoroughly overhaul their engines, boilers, and gasometers. The town itself during the early part of the week presented a very lively appearance, owing to the absence of a vast number of operatives, who regularly avail them of this annual holiday to attend the races at one or other of our favourite racing places. Just at present business seems brisk in all departments.

The Bradford cotton spinning class, kindly taught by Mr. T. Langstaff, City and Guilds of London silver medalist, has obtained the following list of prizes at the result of the examination held May last:

- Ernest Henry Sugden, 1st pass, honour grade, £1 prize, 23 and silver medalist.
- E. Hall, 2nd pass, honour grade, £1 prize.
- C. J. T. Smith, 2nd pass, honour grade, £1 prize.
- R. E. Brown, 2nd pass, honour grade.
- H. Kay, 2nd pass, honour grade.
- J. C. Brown, 2nd pass, honour grade.
- J. C. Brown, 2nd pass, honour grade.