

ANTIMONY MORDANTS FROM WHEY.

The high price of tartar emetic has opened the market to numerous substitutes, amongst which some, like the antimony oxalate, have met with a fair success, while the new fluorides of antimony (which are compounds of fluoride of antimony with potassium or ammonium compounds) are not satisfactory, owing to their corrosive action and their effect upon the hands of the operator. Lactic acid in the pure state has not been admissible owing to its price. From the products of whey it has to be separated as lactate of zinc, and worthless zinc sulphide necessarily results in the liberation from this of the acid.

To avoid this difficulty Kreshmar endeavoured by fermentation of whey to produce an indifferent mixture of lactic, with butyric and other acids, regarding only the final solvent power of the product towards oxide of antimony as of value.

Polarisation and Fehling's reagent indicated in whey 5-6 per cent. of milk sugar—a figure not borne out by the practical test, as quantitative separation in the laboratory gave a much lower result, and disclosed the presence of much "lactose."

To give a more favourable turn to the course of fermentation generally, it becomes necessary to remove albumenoid matters from the whey. The best precipitating agent is sulphate of magnesia, which is preferable to dilute sulphuric acid, ferric sulphate, and others. By adding chalk all excess is thrown down as carbonate, and one single filtration removes albumen, carbonate, and sulphate of lime and magnesia. Peptones are not precipitated; it is desirable therefore that the liquid be treated while fresh and as free from peptones as possible. To test this, the boiled and filtered whey is heated with a little precipitated neutral copper hydroxide, when a slight blue colouration only should appear. If freshly precipitated, well washed, and mixed with a trace of pure glycerine, this reagent will keep a long time in a stoppered bottle, and can be boiled with water without turning black.

The hot filtrate, freed from albumenoids, as indicated, contains still sufficient nitrogenous matter in the form of peptone to allow of easy fermentation, and by observing certain unexplained but essential details, a strongly acid liquid possessing in the presence of alkaline salts an ample solvent power for oxide of antimony. After heating it with an excess of the latter, one litre of the filtrate was found to hold in solution a quantity of antimony corresponding to 66-67 grams of tartar emetic or 75 grams of lactate.

Accordingly 40 grams of sugar had been transformed per litre, whether present as milk sugar or as lactose.

This clear liquid may be diluted with 13 times its weight of water without risk of precipitating basic salt, in order to let it down to the strength of an ordinary mordanting bath containing about 5 grams of tartar emetic.

It is entirely stable, and, worked together with tannic acid, has no damaging effects on shade or depth of dye.

ZULU BROWN is a dye resembling Bismarck brown. It is paraphenyl enediamine hydrochloride.

BEDFORD'S FUSTIN is prepared from fustic by diazotising aniline with nitrite of soda, and combining the product with extract of fustic. It dyes mordanted wool shades which are rather redder than those yielded by fustic alone.

MIKADO ORANGE is obtained by acting with glycerine on paranitrotoluene-sulphonic acid. It dyes cotton a fiery orange in a neutral bath, and has a stronger affinity for cotton than for wool and silk.

CARMINAPHTH is the isopurpurate of potash. It dyes wool with a faint tint in a neutral bath, but it is very loose, a soft soap bath discharging the colour. It is used to distinguish different yarns in weaving cloth.

ALZARINE YELLOW, R.W., is an orange coloured paste, only slightly soluble in water, but readily soluble in caustic soda with a deep orange red colour; on adding acid to this solution the colouring matter is reprecipitated. Stannate of soda turns the alkaline solution brown.

MONNET'S BLUE is a leucothionine; it is dyed on to cotton mordanted in the usual way, and the colour is afterwards developed by treatment with sulphate of copper.

MR. Bennet, of Hebburn-on-Tyne, has taken out a French patent for a dye obtained by heating nitronaphthalene with sulphur, when a green pigment insoluble in water is obtained. This on sulphonation yields a colouring matter which dyes wool in acid baths dark green shades, which are remarkable for their resistance to light and soaping.

BAYER and Co. employ their direct cotton colours to dye wool and silk, by first dyeing the fibre in the usual way, and then passing through a bath of the acetate or sulphate of zinc; the metal and the colouring matter combine to form lakes, which are more resistant to the action of washing than the colouring matter itself.

According to the Society Falck and Co., an aniline black, which does not green or rub off, is obtained, if the cotton yarn after rinsing and drying be treated in a bath, consisting of chlorate of potash, ammonium chloride, aniline oil, hydrochloric acid, and sulphate of copper, in variable quantities. After wringing and drying, the yarn is oxidised in an atmosphere kept moist by steam, then treated with bichrome as usual, rinsed and dried.

The Badische Anilin and Soda Fabrik have patented some new Rhodamines, made by condensing phthalic anhydride with methyl or ethyl amido phenol. The hydrochlorate of the dimethylrhodamine is in needles of a bluish red colour with a violet reflex, soluble in alcohol with a most intense fluorescence. Sulphuric acid yields a pure yellow solution, and hydrochloric acid an orange-yellow coloured solution. These new rhodamines dye wool and silk fine reddish orange shades, and mordanted cotton red shades.

A French patent has been taken out for blue and violet colouring matters derived from benzidine and tolidine, which will, we presume, dye cotton direct. Azo blue is a compound of tolidine and naphthol sodium sulphonate, while the benzoazurines are compounds of the methyl and ethyl ethers of benzidine with the naphthol sodium sulphonates. The new dyes are compounds of benzidine with para-tolyl-alpha naphthylamine and naphthol sodium disulphonate. This gives a blue, while using tolidine instead of benzidine gives a violet. They are prepared as follows:—Benzidine or tolidine is dissolved in water and hydrochloric acid; the product is then azotised by treatment in the cold with nitrate of soda, and the tetrazodiphenyl so produced is combined with the tolylnaphthylamine and then with the naphthol acid. The dye stuff formed is precipitated with salt. No mention is made as to any of the special properties of the dyes.

Another French patent covers the production of a dye which produces on wool a dark blue of a very solid character. Diazobenzol is combined with amidoethylnaphthol sodium sulphonate, and this is then azotised and the tetrazobody formed combined with naphthol disulphonate, when the dye stuff is formed.

One of the most noticeable objects at the Electrical and Industrial Exhibition, now being held in the Bingley Hall, Birmingham, is a case containing an excellent selection of elaborate articles of dress and household furnishings dyed and cleaned at the Sketchley Dye Works, Hincley. This is by far the best and most unique exhibit of its kind ever shown, and well illustrates the perfection to which the art of dyeing and cleaning has been brought. Most noticeable amongst the specimens of work exhibited are a handsome dress of most delicately coloured shot silk, a valuable Roman silk shawl, fragile fans, costly feathers, and numerous fancy embroidered articles, all of which have been cleaned by the *nettoyage a sec* process. The colours are perfectly preserved, the lustre and finish perfect, the whole looking as fresh and good as new. The various dyed articles are equally commendable, the figured damask and richly coloured silk plush being exceptionally well dyed and finished. The space surrounding the case is draped with lace curtains, each curtain being dyed in a gradation of art shades, a distinct novelty, and very effective, whilst a pretty arrangement of dyed pampas grasses give a pleasing finish to the whole.

Machinery and Appliances.

IMPROVED MULE: RIM PARALLEL WITH CARRIAGE.

MESSRS. JOHN HETHERINGTON AND SONS,
MANCHESTER.

One of the most remarkable things that strikes the student of the history of the cotton trade, is the rapidity with which machines and even the buildings containing them are rendered obsolete by the progress of invention. This has often occurred long before what may be termed the natural term of their life has expired, when they require to be displaced or disused through being worn out. Many instances of this kind might be pointed out were it necessary to substantiate the affirmation, but as we have no doubt many of our readers will be able to confirm it within their own experience, we will content ourselves with pointing out the fact how completely a recent type of cotton mill has been rendered almost useless and worthless by the enlargement of the mule to the dimensions now usually constructed. We refer to the long and comparatively narrow mills built to accommodate mules containing from 600 to 800 spindles. Since the latter have been lengthened so as to contain from 1,000 to 1,200, the short ones have been placed at a great disadvantage, and in many cases their use has been compulsorily discontinued, owing to the impossibility of their production in the present times of severe competition being sold at prices as low as that from the long mules. The result has been, in this country at least, that many of these mills, though excellent in every other respect, have been abandoned or converted to other and inferior purposes as a course preferable to those working them facing certain ruin, or the alternative of a further great outlay of capital upon them to render them fit for the machinery made to-day. In America there are still many of these old mills maintained at work, but this has only been possible owing to the high degree of protection enjoyed by the cotton trade in that country, and as the period is rapidly approaching when the machinery will be worn out and must be replaced, their owners, we believe, are looking with some degree of anxiety to what has to become of them, and whether they will have to confront the responsibility of erecting new structures and practically submitting, as their English competitors have had to do, to the extinguishment of the capital they represent, as it is quite out of the question that they should renew their machinery upon the old type. Mechanical or architectural conversions rarely answer well in these departments, any more than they do in other spheres of interest to mankind. There has, therefore, apparently been nothing but Hobson's choice before them. But the student who has often noted such things as the above will also occasionally have encountered the fact that invention and improvements sometimes occur very opportunely to clear the way from difficulties and preserve the life of capital otherwise irretrievably lost. The owners of such mills as we have spoken of, especially in the United States, where they have not yet been dismantled, will, we think, welcome the improvements made by Messrs. John Hetherington and Sons in their self-acting mule as a case in point, and one that will relieve them of a great difficulty and much apprehension.

Messrs. Hetherington, as large machinists, have had this difficulty of dealing with obsolete mills

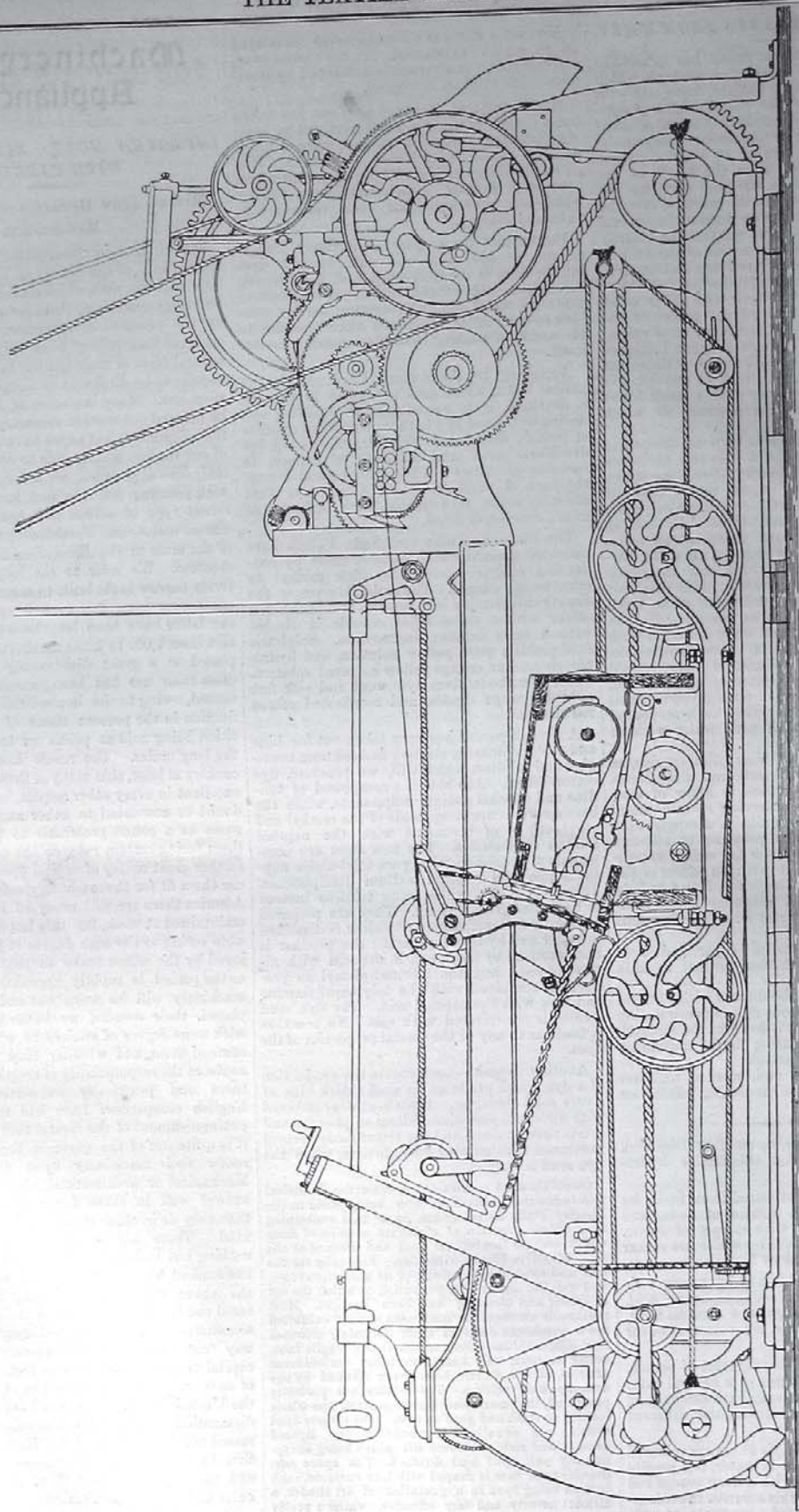


FIG. 1.—IMPROVED MULE : PARALLEL DRIVING ARRANGEMENT.—MESSRS. JOHN HETHERINGTON AND SONS, MANCHESTER.

forced upon their attention so repeatedly in the course of business, that they have been led to consider whether they could not, to a large extent, be saved to their original use. The chief difficulty in the way was the heavy expense of re-arranging the gearing of the mills, the original setting out being for driving the mules when set across the width of the rooms. It was soon apparent that a simple alteration in the headstock would quite obviate all necessity for the expensive alterations hitherto essential in adapting mills on the older type to receive the modern mule. This was to place the rim shaft parallel with the carriage, instead of, as usual, transversely. This was quickly accomplished, as shown in our illustration, and has proved a complete solution of the difficulty so far as rendering it possible to use narrow mills advantageously for mule spinning goes. This will very widely be regarded as an improvement of first class importance. The headstock as thus modified is shown in our illustration, Fig 1.

and is accomplished by means of grooved pulleys and ropes. The bevelled gearing and the cross movements connected with this portion, so frequently a source of breakages, are thus enabled to be dispensed with.

As one improvement often makes room for another, so it has been in this case. All the bevels from the twist wheel down to the front roller have been removed and substituted by spur gearing. In connection with the front roller, the makers have introduced a considerably larger clutch box, rendering it stronger and quicker in action, and diminishing the liability of breakage. The sliding portion of the box is provided with a bearing much longer than usual by which the movement sometimes termed "wobbling," is quite prevented. This consisted of a slight canting of the clutch box through the hole getting too large through wear, and which resulted in the imperfect engagement of the teeth, only a portion entering causing great strain upon them and frequent breakages. This is an improvement that has

take the drawing-up friction out of gear. This constitutes a safety action, as the momentum of the carriage puts it out of gear. Beneath the third lever is a fourth one, to the end of which is attached a rod extending along near the floor to the front of the headstock, and connected with the treadle for stopping the mule at any position of the inward run of the carriage. This treadle is locked by the safety lever which keeps it in that position until the operative releases it, when the mule resumes its action. The safety lever also prevents the drawing-up motion acting prematurely or until the carriage has completed its outward run, owing to the carriage having to relieve it at the end of its journey. The drawing-up motion is put into gear by means of springs. The aggregate of these changes constitute a great improvement which will be appreciated very highly by those having the practical oversight of the machinery, and not less by the cotton spinner for the tangible advantages that will be found to arise from them.

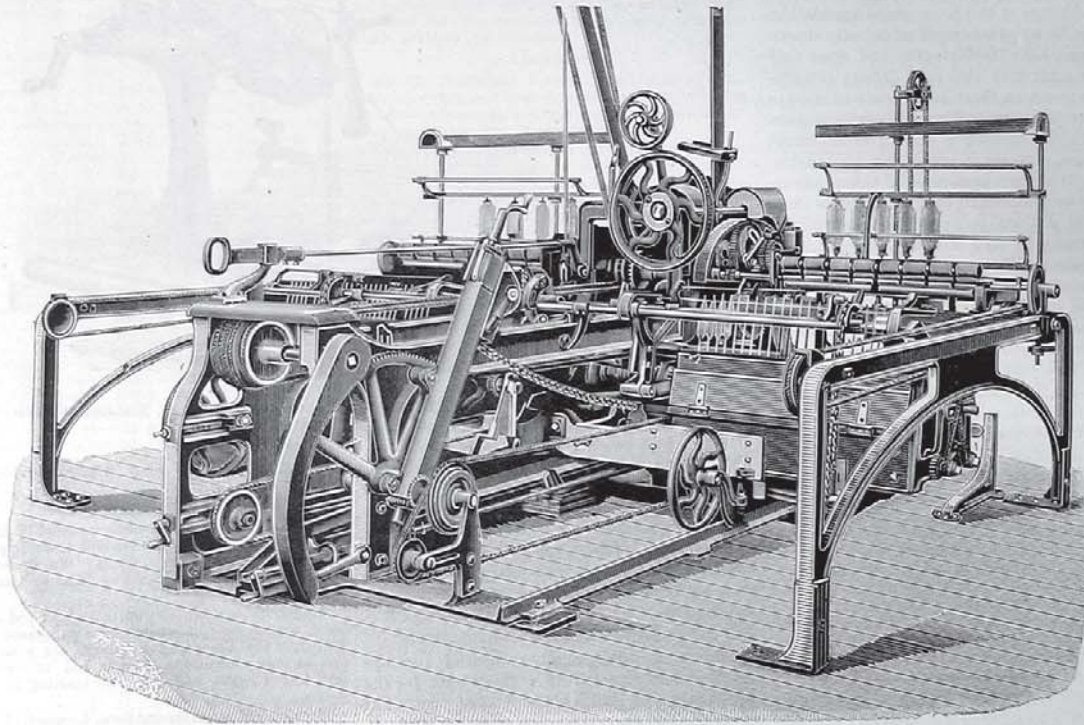


FIG. 2.—MULE WITH ORDINARY DRIVING ARRANGEMENTS: MESSRS. JOHN HETHERINGTON AND SONS, MANCHESTER.

In the overhauling of the headstock necessary to accomplish this alteration others of great value were suggested. The driving arrangements as commonly constructed, it has often been demonstrated by numerous breakdowns of its parts, is overburdened with work. It was seen to be possible to effect a much better distribution of the labour, and means were adopted to relieve the driving arrangement from the task of drawing out and taking up the carriage, confining its duty to driving the front rollers and spindles. This was a large proportion of the work the driving strap had to perform, and its transference elsewhere will greatly reduce, if not entirely obviate the numerous breakages to which it has been liable. Less breakages, steadier working, and greater production result from this change.

The duty of drawing out and taking up the carriage is now placed upon the counter shaft,

been highly appreciated by the trade in America.

The rim shaft has been greatly strengthened, being now made of steel 1½ inch diameter, as against the old one of wrought iron 1½ inch diameter. The connected parts are also all strengthened steel, having been introduced wherever possible.

Important improvements have been effected in connection with the drawing-out motion, which by the new arrangement is held out of gear by the cam shaft by means of a small lever keyed upon an upright shaft attached to the back of the headstock. On this upright is fixed a second lever, the forked extremity of which works the drawing-up friction gear. Fixed below the second lever is a third one, which is placed in such position at the back of the carriage, that if the cam shaft from any cause should miss its change, the carriage itself will

The sum of the improvements effected is, however, not yet told. The makers have also introduced a large backing-off friction arrangement, by which slipping is quite prevented, a fact which can be easily tested and the means for doing which are well known. Cast upon the backing-off lever is a projection, to which is attached a finger, one end of which would act upon a small bowl upon the strap-fork lever in the event of the backing-off friction wanting to get into gear, and would prevent it until the strap had got upon the loose pulley. This arrangement effectually prevents the two motions entering into a contest with one another for the mastery, and thus obviates much of the wear and tear of the strap and risk of breakage to the wheels.

In the ordinary arrangements the movements of the straps when changing positions is much too slow, causing considerable loss of time, which

it is desirable should be avoided as far as possible. To accomplish this the makers have designed and supplied this mule with an improved hastening motion for expediting the movement of the strap in both its directions of traverse. It may also, if preferred, be used for either way alone.

An improved full-cop stop-motion has been added by the makers; it is simple in construction, effective in action, and not liable to derangement. The headstock is also fitted with a backing-off chain tightening motion of a very simple and effective character. Another improvement the makers have introduced is to substitute a continuous drawing-up rope for the two now in use. This arrangement has a tightening motion fixed on the back of the square so that it is easily accessible. In the arrangement in common use one hand may be doing all the work and the other nothing. This ensures uniform work from both scrolls.

If desired the makers can supply to this mule, roller, jacking, stretching and nosing motions, either automatic or as worked by hand.

We had better at this point guard against the conclusion being possibly yet mistakenly drawn that Messrs. John Hetherington and Sons only make the mule with this new driving arrangement; it is not so, these being made to meet a growing requirement. They still continue making it with the transverse driving arrangement and we have pleasure in presenting an illustration (Fig 2) of their head stock of this construction, and we understand that the latest of these mules sent out are producing 30 hanks of 42's weft, and may be seen working on application to the makers. We may add in conclusion that the improvements described excepting those which are special to the new parallel driving arrangement, all are supplied with the ordinary transverse system of driving.

We are sure that the thorough over-hauling Messrs. John Hetherington & Sons have recently given to the mule, and the great number of improvements described above must at once command the attention of the trade. The parallel driving arrangement is of great importance especially in relation to the utilisation of the older class of mills, to which for little or no outlay it gives another lease of life. We especially commend it to the attention of the American branch of the trade, to which, owing to its present condition this improved mule will prove interesting and acceptable. The makers will be pleased to enter into communications with gentlemen or firms desiring further information, and may be addressed as above.

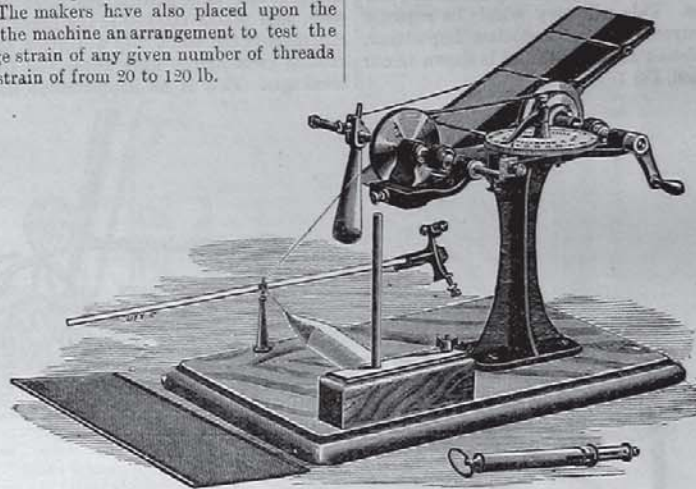
PATENT COMBINED YARN TESTING AND INSPECTING MACHINE.

MESSRS. HENRY WALLWORK AND CO., CHARTER STREET, MANCHESTER.

There are not many articles of commerce in these days that it is safe to take upon trust. Yarn is certainly not one. The spinner, the merchant, and the manufacturer therefore dealing as they do largely therein require to examine them very thoroughly in every aspect of their quality. To do this efficiently necessarily requires numerous appliances. The old-fashioned reel was one widely in use for testing counts. Another machine has been invented for testing the breaking strain, and another again for discovering the amount of twist the yarn may contain. Sundry other appliances for one purpose or another have been provided in connection with this subject. The result has been that the aggregate is somewhat confusing. To obviate this Messrs. Henry Wallwork and Co. have invented an improved yarn tester, which combines all the appliances mentioned in one machine, and also secures

several other important advantages not obtained from them.

The yarn, instead of being wound upon the ordinary reel, is wound upon a black card and traversed in an even layer across it. When full the card contains one lea. The black ground shows very clearly any irregularities or defects of quality, while a good quality is equally strongly demonstrated. These cards are exceedingly useful in preserving standard qualities for future reference and comparison, and on examination and comparison any departure is very easily detected. A simple arrangement combined with the reel shows the elasticity of the sample under test. Another tests the strength of single threads and registers the weights of the breaking points by 1/4-ozs., which, on comparison show average strengths. Another arrangement is for discovering the amount of twist in doubled yarn. The makers have also placed upon the base of the machine an arrangement to test the breakage strain of any given number of threads with a strain of from 20 to 120 lb.



COMBINATION YARN TESTING AND INSPECTING MACHINE.—MESSRS. H. WALLWORK AND CO., MANCHESTER.

It will thus be seen from this brief description that the little machine shown in our illustration is a remarkable combination and one that is almost indispensable in a well-furnished office or warehouse of spinners, manufacturers, or merchants. All these various classes have shown their appreciation of it, as is demonstrated by the large sale that has been made, though it is only of comparatively recent introduction.

The cards are specially prepared for the machine and supplied at a cheap rate for the preservation of standard samples of yarn. For other particulars, application may be made to the makers at the above address, who, we have no doubt, will be pleased to give prompt attention thereto.

A large steam jacquard weaving shed is in course of erection at Aseh, in Austro-Hungary. The speciality of Rossbach, namely, shawls of different colours, will be manufactured. It is said that other power weaving sheds are projected at the same place.

The increase in the number of power-looms in Austria, which attracted attention last year, still continues. During the remainder of this year and the early part of next, several cotton spinning establishments will come into operation with almost a quarter of a million of spindles, which will produce about twenty million pounds of yarn. The establishments are the Taunwälder Spinnfabrik, the Theresienthaler Actien-gesellschaft, G. Borkenstien and Söhne, Wm. Brasz and Söhne, of Hohenstadt, M. F. Oberlaender, of Eipel, Müntzberg and Co., of Theresienau, B. R. Neumann, cf Friedek, Kühne and Sons, of Görkau, and others.

News in Brief,

FROM LOCAL CORRESPONDENTS AND CONTEMPORARIES.

ENGLAND.

Ashton-under-Lyne.

We are informed that Messrs. Reyner and Sons and Messrs. S. Heginbotham and Sons will both be floated as limited companies in the course of a few weeks.

At Ashton-under-Lyne on Wednesday, four men, named Gallagher, Greenwood, England, and Howar, were charged with assaulting John Holden with intent to intimidate him from following his employment. The defendants are cardroom hands on strike at Oldham, and the complainant was a "knobstick." The allegation is that the defendants, who were picketing the mill, followed Holden to Ashton on September 18th, and there attacked him and

kicked him severely. They were committed for trial and admitted to bail.

Bacup.

The new shed which is being erected by Messrs. J. and J. Hoyle Bros., of Olive Mill, is being pushed forward with all possible speed. We understand that a part of the new building is to be used as a sizing room.

Messrs. Molesworth-Hepworth and Co., of Albion Shed, who, some few weeks since purchased Grove Mill from the Co-operative Stores, are pushing on the various alterations, and intend to have the mill full of looms and ready for starting in a few weeks.

Messrs. Joshua Hoyle and Sons, Limited, of Bacup and Summerseat, will close the whole of their extensive cotton-spinning and manufacturing mills next week. The firm owns about 3,000 looms and 100,000 spindles. At Rochdale nearly all the mills are working equal to half time.

Barking.

The statutory meeting of the shareholders in the Barking Jute Factory, Limited, was held on Tuesday, at Winchester House, London, Mr. N. Harris, in chair. The chairman said this was a statutory meeting, at which no accounts were presented, but he would refer to a few matters likely to interest them. The capital of the company was £100,000, of which £75,000 only had been issued, and was over-subscribed by the public, the balance of £25,000 having been reserved for future issue if necessary. The title deeds were now in the possession of the company, and the directors believed they had obtained a very valuable property. A competent mill manager had been secured in the person of Mr. William Lee, formerly of Dundee. Economy was being exercised by the board to keep the cost of production as low as possible, and they hoped, by the various improvements that were being carried out, to increase the output. These included replacing a portion of the spinning gear, and adding more frames. They were also fixing up a new dressing machine. At the present moment they were turning out about 70 tons of manufactured