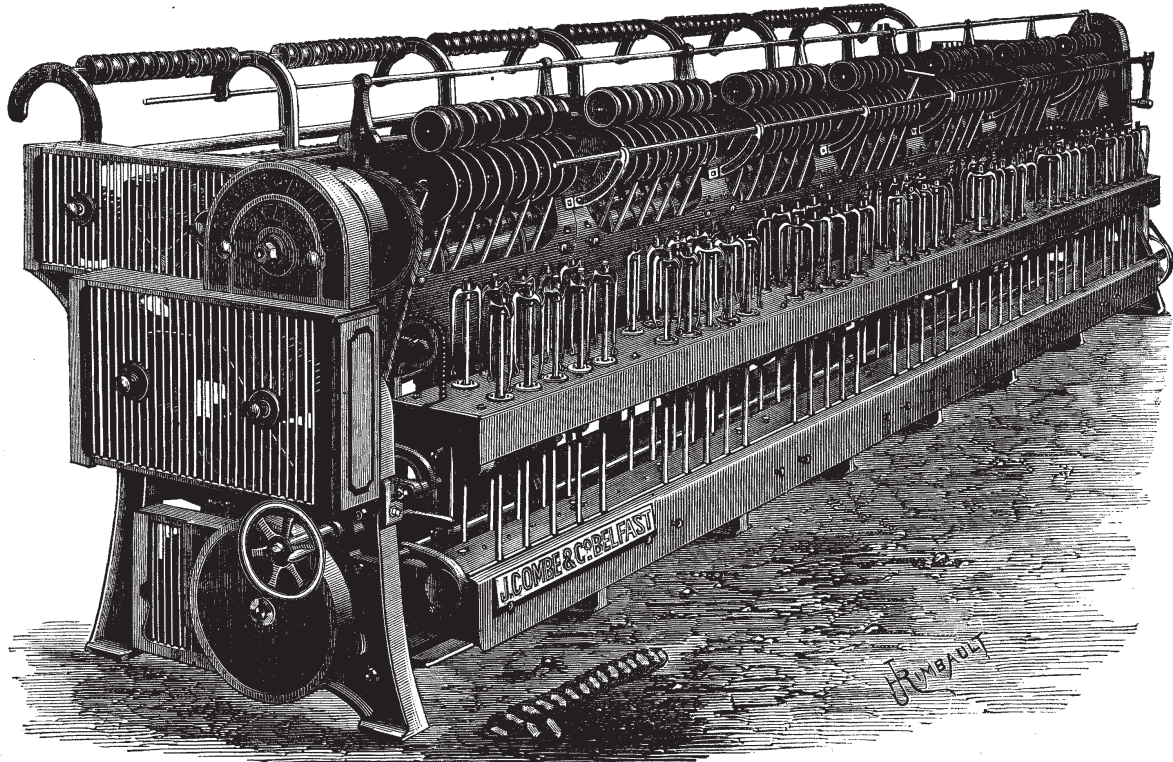


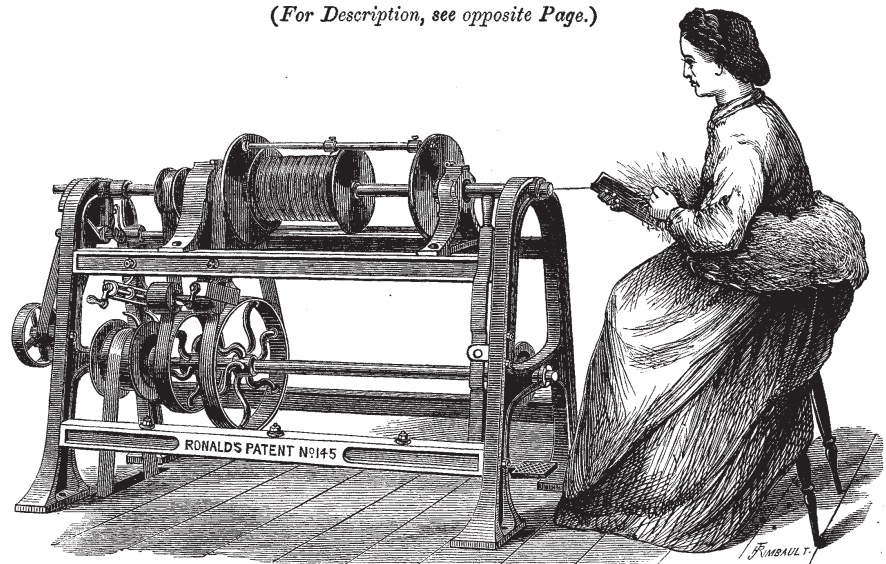
FLAX SPINNING FRAME.

CONSTRUCTED BY MESSRS. COMBE AND BARBOUR, ENGINEERS, BELFAST.

(For Description, see opposite Page.)

RONALD'S SPINNING MACHINE FOR FLAX, JUTE, &c.

CONSTRUCTED BY MR. THOMAS BARRACLOUGH, MANCHESTER.

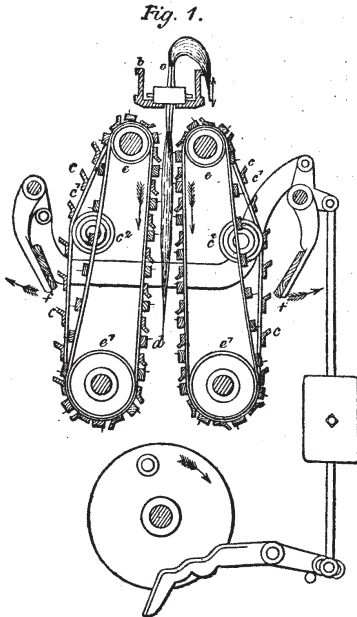
(For Description, see opposite Page.)

TEXTILE INDUSTRY AT THE VIENNA EXHIBITION.—No. XXIII.

By DR. H. GROTHE.

MACHINERY FOR THE TREATMENT OF FLAX, HEMP, JUTE, &c.—(Continued.)

THE scutching machines exhibited at Vienna represented two systems only, namely, that with radially arranged scutchers, and another with blades or scrapers. The latter we should prefer, and we consider that this system, but with adjustable counter-pressure to accommodate an increased supply of material, will in future offer the correct solution of the problem of machine scutching. Attention has certainly been called to the fact that many improvements are required in the existing systems of breaking and scutching flax, and thus another step towards perfection may be expected.



FLAX-HACKLING MACHINE BY MESSRS. COMBE AND BARBOUR, BELFAST.

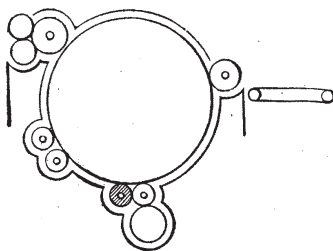


FIG. 2. LAWSON'S JUTE BREAKER.

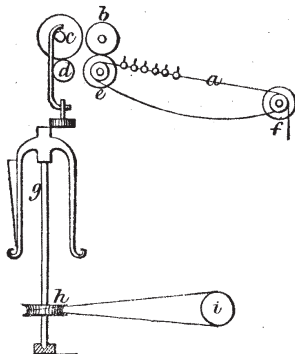
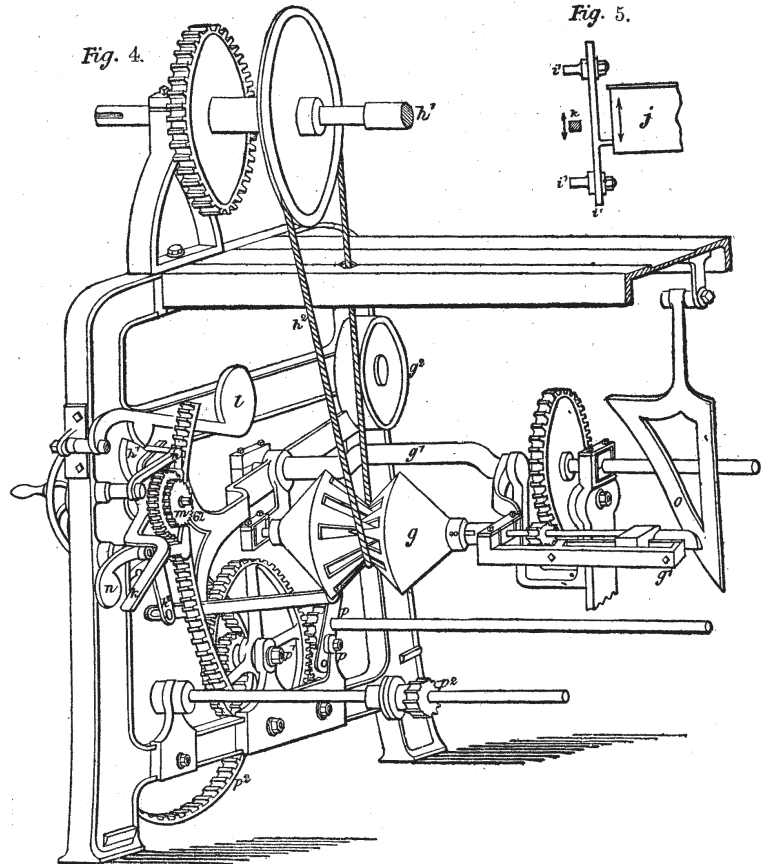
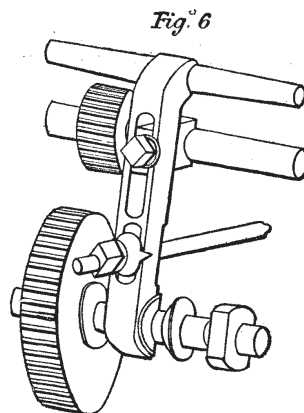
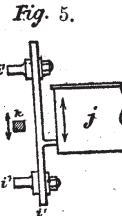


FIG. 3. LAWSON'S HEMP-SPINNING MACHINE.



DETAILS OF ROVING FRAME FOR FLAX, BY MESSRS. COMBE AND BARBOUR, BELFAST.



GORDON'S SADDLES FOR FLAX-SPINNING FRAMES, BY MESSRS. COMBE AND BARBOUR, BELFAST.

For the hackling of flax, the Vienna exhibition contained one machine only, namely that exhibited by Messrs. Combe and Barbour, of Belfast. This machine, represented by the annexed Fig. 1, has strong and simple hackle teeth, which are so made that the pins enter the flax at right angles, and close to the holder. The machine has an adjustable lift, whereby it can be used for either short or long flax; the waste is separated from the tow, and the stripping motion is simple and correct in its action without vibration. The figure shows a section of the sheets and stripping apparatus. The flax is carried by holders *a*, which slide along the channel *b*. The stripper bars *c* of rolled iron are carried on bands *c'* similarly to the hackles *d*, and pass round the top and bottom sheet rollers *e* and *e'* with them, but at the back or outside the stripper bars *c*, which are brought out by carrier pulleys *c''*, take off the tow, and any that is left on the bars *c* is caught by the tow catcher *f*, from which it is thrown into the tow box during the passage of the flax to the next gradation of hackles to the next.

For finer work, cut line, and in some cases for fine long line, Messrs. Combe and Barbour make brush machines, in which the arrangement as regards the hackles is similar, but instead of the stripper bars they use a rotary brush and doffer. The chief peculiarities of this machine consist in the mode of attaching the hackles to the sheets which carry

them, so as to make the pins strike at right angles into the flax; in the sheets having no teeth inside, and being consequently smooth, easy, and light-running in their motion; and in the simplicity of the gearing, and the facilities for making changes to suit different lengths and kinds of material. The sliding motion is produced by a weight, and can be adjusted so as to push the holders past the last or tree tools when desired. The contrivance for screwing and unscrewing the holders by machinery insures a proper holding of the material and prevents loss of yield, and it also saves labour.

Messrs. Samuel Lawson and Sons, of Leeds, exhibited a jute breaker card, which showed a strong construction, and which had been already practically tried with satisfactory results. This jute breaker card, the general arrangement of which is represented by the diagram, Fig. 2 (see previous page), is constructed in such a manner that the jute is transferred to the drum from the table by means of a feeding roller with guard; this latter is adjustable, and its position with regard to the feeding roller can be altered. The ends of the "travellers" are well protected against the winding round of the fibres. The delivery rollers are heavy and large. All the bearings can be easily adjusted, the covers are hinged, and the wheel gearing is placed outside the frame, so that it can be conveniently cleaned. The jute spreader contains a contrivance for the preventing of irregularities if a needle breaks off. The pressure rollers are made of cast iron, and are provided on both sides with weights in order to exercise a uniform pressure upon the material, which advances at a constant speed. Merely mentioning here a machine exhibited by Messrs. Lawson and Sons for the preparatory treatment of the hemp, namely, a spreading machine, we pass at once to a new hemp-spinning machine exhibited by the same firm. This spinning machine, the general arrangement of which is shown by the diagram, Fig. 3, is provided with a hackling chain *a*, offering a large working surface. The spindles *g* are put in rotation by the pulley *h* connected with a belt with the pulley *i*, and make 1200 revolutions per minute, a speed that could not be attained with wheel gear. The rollers *b e* and *c d* conduct the hemp from the chain to the spindles.

Messrs. Lawson and Sons also exhibited a jute copping plate or rail, the side frame of which is constructed in such a manner that it serves as a cover for the wheel gear, and that it provides a convenient support for the bearings, preventing the application of loose slides, &c. This arrangement is new, and it reduces the number of wheels and of journals. The outer part of the frame may be removed without the use of a spanner, and the shaft for the bobbins may be taken out without interfering with the spindles or with the sliding carriage. The quadrant levers allow a vertical lifting to take place, without putting any considerable strain upon the pins of the links of the chain. The carriage slides in rectangular slots, and its ends are supported by guides fixed to the side frames.

Messrs. Combe and Barbour, of Belfast, exhibited at Vienna a roving frame for flax, represented by the illustrations, Figs. 4, 5, and 6, and an example of which was shown at Paris in 1867. The improved construction exhibited at Vienna contained Combe's patent arrangement of the "take up and traverse" motion, in which by the introduction of an expander *g* which is driven from a pulley *h* on to the front roller *h'*, the most simple as well as most accurate action that has yet been attained is produced. The arrangements for changing the twists and traverse are exceedingly simple and accessible. In the illustration (Fig. 5), the bracket *i* with two adjustable pins *i'* is carried on the bobbin lifter *j*, which as it rises and falls brings the pins *i'* into contact with the lever *k*, on which is the wedge *k'* that changes its position after passing the points by the weighted lever *l* (Fig. 4). This action frees the ratchet wheel *m* of one of the pawls *n*, and allows it to turn slightly round and lift the cone carriage *g'* by the weighted quadrant *g²*, which closes the expander *g* by the action of the wedge *o*, at the same time its alteration in position compensates for the effect which the increased diameter of the expander *g* would exert on the band *h²*. The wedge lever *k²* also reverses the traverse by changing the pinions *p* in contact with the traverse gearing *p' p² p³*. The advantages of this arrangement are perfect accuracy of action, while the liability to slip which is so evident in friction plates, or long cones, is avoided. The finest numbers can also be spun with facility, the reversing of the traverse being instantaneous, while the winding of the rove is more equal than with the mangle wheel. Where

required in heavy frames, convenient steadiers are applied to the top of the spindles. It will be admitted that the construction of this roving frame is very ingenious, especially with regard to the expanding pulley adapted to the differential motion, by means of which its position alters its working diameter and enables a constant length of driving band to be employed. The simplicity and precision of the motion for changing the traverse and speed of the bobbin, which from the non-elastic character of the flax fibre requires to be exceedingly accurate, is another peculiarity of this machine.

We may add, that the construction of the "spreader" and the drawing or "roving frame," exhibited by Messrs. Combe and Barbour, may be regarded as fair samples of the style of construction of the flax and jute preparing machinery of this firm. Perspective views of Messrs. Combe and Barbour's spinning frame are given on pages 382, and 385, while Fig. 6 on the previous page shows a detail to which we shall refer directly. In the construction of this machine, Messrs. Combe and Barbour have paid particular attention to the relative positions of the spindles, thread plates, rollers, and flutes, and they have adapted them to the work for which they are intended. Careful attention to these points must, of course, greatly increase the turn off of yarn per spindle, and reduce the quantity of waste. This frame is provided with cylinders and wharves as large as possible, with strong spindles, long collars, and a simple builder motion. The arrangement, known as "Gordon's patent saddles" shown by Fig. 6, of which we understand Messrs. Combe and Barbour are the sole makers, has given much satisfaction, and no doubt great advantages attend their use for medium and coarse work. We may mention here that Messrs. Combe and Barbour also exhibited, as an appendix to their flax spinning machinery, a "hop machine" for tow slivers, and a "fluting machine" for the pressing rollers of spinning frames. This fluting machine can be made single or double; it has a small slide lathe attached, the cutters revolve on a socket on a steel spindle, and rise or fall by a scroll index, thus making exact work. The machine is made heavy and well fitted to bear a high speed and prevent vibration.

Before finishing our report of this class of machines exhibited at Vienna, we have to mention Ronald's patent spinning machine for spinning all kinds of hemp, flax, jute, Manilla, &c., constructed by Mr. Thomas Barraclough, of Manchester. This machine, which will easily be understood from our illustration on page 382, is a renovation of hand spinning, and is made for the purpose of substituting female for male labourers, especially in places

which are remote from all centres of civilisation and manufacture, and where nature produces a large quantity of fibres useful for spinning and weaving. The machine is very simple, it has very few wearing parts, and any woman of ordinary intelligence can superintend it and keep it in working order. The production of the machine varies according to the material to be spun, the thickness of the yarn, and the quantity of twist put into it.

FLAX SPINNING FRAME.
CONSTRUCTED BY MESSRS. COMBE AND BARBOUR, ENGINEERS, BELFAST.
(For Description, see Page 383.)

