

**JERSEY MILL COMPANY, LIMITED, MANCHESTER.**  
Registered on the 27th ult., with a capital of £2,000, in £1 shares, to carry on the business of cotton spinners and manufacturers. The subscribers are:—  
Shares.  
N. W. Chandler, Chorlton-on-Medlock, mechanical engineer..... 1  
J. Cryer, Ashton-under-Lyne..... 1  
E. Wilson, Hulme, draper..... 1  
D. Spary, Irlams-o'-th'-Height, cashier.... 1  
J. Gaskell, Moss Side, clerk..... 1  
G. Platt, Chorlton-on-Medlock, clerk..... 1  
R. Welch, Greenheys, appraiser..... 1  
The subscribers are to appoint the first directors. Solicitors, Messrs. Hardings, Wood, and Wilson, 69, Princess-street, Manchester.

**Gazette News.**

**ADJUDICATIONS.**

Alfred Brooke, Cliff Terrace, Manningham Lane, and Blanche-street, Laisterdyke, Bradford, wool-stapler.  
Taylor Wheelhouse and John Hall, Industry mill, Thornton-road, Bradford, commission wool combers.  
David Stutterd, John Stutterd, and Tom Stutterd, Orchard mill, Padiham, cotton spinners and manufacturers.  
Edward Stanyear (trading as A. Stanyear and Son), Irk mills, Long Millgate, Manchester, waste merchant.

**RECEIVING ORDERS.**

Alfred Brooke, Manningham Lane, Bradford, woolstapler; Bradford.  
Edward Stanyear, Long Millgate, waste merchant; Manchester.

**PARTNERSHIPS DISSOLVED.**

Duckworth and Parkinson, Garden-street, Ramsbottom, cotton manufacturers.  
Craven and Speeding Brothers, Monkwearmouth, Sunderland, canvas and general merchants; as regards James Speeding.  
Sidebottom and Hardie, Manchester; merchants.  
William Collier and Son, Fuller-street, Pingle-street, Leicester, worsted spinners.  
London Flock Company, Carter-street, Walworth-road, Surrey, flock manufacturers.  
Paul Schmidt and Philip Padgett, Union-street, Bradford, stuff merchants.  
Price and Trivett, Fletchergate, and Carvers Factory, Nottingham, lace manufacturers.

**NOTICES OF DIVIDENDS.**

Arthur Henry Wilson, residing at 6, Elm-road, Seaforth, and carrying on business at 26, Exchange-street, East, Liverpool, and lately carrying on business in partnership with James Baillie Arkle, as Wilson and Arkle, at 26, Hackins Hey, Liverpool, cotton broker; 4s. 8½d., first and final, under scheme.  
Henry Barton, Buglawton, near Congleton, Cheshire, silk throwster; 1d. first and final.  
John Mitchell (trading as John Mitchell and Co.) residing at Grove Terrace, Greensnook, Bacup, trading at Albion Works, Greensnook, aforesaid, yarn agent, dyer, and winder: 1s. 6½d. first and final.

**Patents.**

**APPLICATIONS FOR PATENTS.**

The names in italics within parentheses are those of Communicators of Inventions.

Where Complete Specification accompanies Application an asterisk is suffixed.

1889.

**24TH FEBRUARY.**

2,911. *ISAAC KIRKBRIDGE*, 8, Quality Court, London. Letting-off motions for looms.  
2,918. *J. A. BARFOOT*, 3, Station-street, Leicester. Stockings and the process of manufacturing same.  
2,929. *J. BEEVER*, Halifax. \* Cropping machines or "perpetuals," for shearing hearth-rugs, carpets, etc.  
2,930. *R. ECCLES*, Commercial-street, Halifax. Apparatus for easing the shuttle in looms.  
2,936. *J. SEED*, 46, Lincoln's Inn Fields, London. Looms.  
2,938. *F. L. LUMB*, 1, Quality Court, Chancery-lane. Stop-motion for twisting and doubling frames for worsted and such like material.

2,946. *LEO PARSEY*, Vale View House, Leybourn, Yorkshire. Shooting stockings.

**25TH FEBRUARY.**

2,999. *FRANZ WANECEK*, 41, Eastcheap, London. Protecting throw straps and pickers of looms.  
3,003. *E. HOEPEL*, 41, Eastcheap, London. Regulator for weaving-loom tackle.  
3,009. *S. D. KEENE*, 55, Chancery-lane, Middlesex. Process of and apparatus for bleaching, dyeing or otherwise treating fibrous materials.  
3,018. *J. HOWARD* and *J. H. GEDDES*, 33, Southampton Buildings, London. Apparatus for clipping wool or other similar fibrous products.\*

**26TH FEBRUARY.**

3,038. *J. B. WHARTON*, 55, Chancery-lane, London. Coloured lace curtains.  
3,093. *H. H. LAKE*, 45, Southampton Buildings, Middlesex. Pressing and steaming cloth and other textiles. (*D. Gessner*, U.S.)\*  
3,095. *H. H. LEIGH*, 22, Southampton Buildings, Middlesex. Colouring matters. (*R. G. Williams*, U.S.)  
3,098. *H. H. LAKE*, 45, Southampton Buildings, London. Colouring matters. (*Wirth and Co.*, Agents of *A. Leonhardt and Co.*, Germany.)

**27TH FEBRUARY.**

3,107. *W. KNIGHT* and *R. ASHWORTH*, 4, St. Ann's-square, Manchester. Shuttles.  
3,149. *G. THOMSON* and *J. HAMPSHIRE*, 2, New-street, Huddersfield. Checking the shuttles of power looms.\*  
3,167. *G. T. TODD* and *W. TANNAHILL*, 96, Buchanan-street, Glasgow. Kidderminster, Scotch, and ingrain carpets.

**28TH FEBRUARY.**

3,174. *T. WRIGLEY*, New Bridge-street, Manchester. Ring-frame spindles and bobbins.  
3,178. *GEO. CASEY*, 8, Quality Court, London. Machinery for grinding the surfaces of cards or flats of carding engines.  
3,181. *G. REISS* and *J. BAUER*, 1, St. James'-square, Manchester. Fringed shawls and shawl fabrics.  
3,182. *R. MIDDLETON* and *H. T. JONES*, 1, St. James'-square, Manchester. Improvements applicable to the selvages of cotton pile goods.\*  
3,186. *J. PROCTOR*, 4, St. Ann's-square, Manchester. Mechanical stokers for steam-boiler furnaces.  
3,188. *G. HADDEN*, 4, St. Ann's-square, Manchester. Knitting hosiery and apparatus therefor.  
3,190. *E. DOUGHTY*, Foxhall-road, Nottingham. Lace.  
3,194. *R. L. HATTERSLEY* and *J. HILL*, 58, Low-street, Keighley. Driving, brake, and box operating mechanisms of looms.  
3,201. *C. L. JACKSON*, 8, Quality-court, Chancery-lane. Cloth-stretching machines.  
3,210. *W. FENWICK*, 6, Bank-street, Manchester. Cotton gins.

**1ST MARCH.**

3,264. *A. A. HAIGH*, 64, Barton Arcade, Manchester. Waterproof paper and textile fabrics.  
3,265. *B. ORMEROD*, *J. F. DAVIES*, and *W. HAYTHORNTHWAITE*, 17, St. Ann's-square, Manchester. Appliances for ventilating and regulating the temperature and humidity of the atmosphere in spinning and weaving factories.  
3,267. *H. M. MARSDEN*, Wortley-villas, Meersbrook-bank, Chesterfield-road, Sheffield. Improvements in the rotating half or part of the cutting apparatus of such machines as have twisted or spiral cutters attached to a revolving cylinder for shearing, cropping, smoothing or cutting purposes.  
3,301. *E. SAMUEL* and *A. SAMUEL*, trading as *LA SOCIETE SAMUEL COUSINS*, 47, Lincoln's Inn Fields, London. Machinery for printing fabrics.  
3,303. *J. B. WILLCOX*, 47, Lincoln's Inn Fields, London. Fast dye-stuffs, for printing and dyeing. (*The Farbenfabriken vormals Bayer and Co.*, Germany.)

**4TH MARCH.**

3,397. *B. WILLCOX*, 47, Lincoln's Inn Fields, London. Alpha naphthol sulpho acids and dioxynaphthalene sulpho acids, and dye stuffs therefrom. (*Farbenfabriken vormals F. Bayer & Co.*, Germany.)  
3,398. *B. WILLCOX*, 47, Lincoln's Inn Fields, London. Mordant dyeing azo colouring matters of the triphenylmethan group. (*Farbenfabriken vormals F. Bayer & Co.*, Germany.)  
3,420. *R. A. WHYTAW* and *T. McLAREN*, 87, St. Vincent street, Glasgow. Loom mechanism for ornamental weaving.  
3,451. *W. H. NAYLOR*, 45, Southampton-buildings, London. Machinery for twisting cords, driving bands, or the like.\*  
3,465. *P. M. JUSTICE*, 55, Chancery-lane, Middlesex. Knitted stocking. (*Wilcomb Knitting Machine Co.*, U.S.)\*

3,474. *THOMAS, JAMES*, and *JOHN WILLIAM KIDDIER*, 24, Southampton-buildings, London. Rotary knitting machines for producing rib fabric.

**5TH MARCH.**

3,498. *W. S. S. HUNTER* and *J. MACHIE*, 76, Agnes-street, Belfast. Winding yarns of flax, etc., in pirns or cops.  
3,507. *S. H. SPARKES*, Hill View, Wellington, Somerset. Sectional warping and beaming.  
3,522. *J. R. WILLIAMS*, 3, Wellfield-street, Oldham-road, Rochdale. Leather tubes for cotton spinning rollers.

**7TH MARCH.**

3,626. *W. NORTON* and *F. HINCHLIFFE*, 9, Old Bank-chambers, Leeds. Dealing with warps and hanks whilst dyeing.  
3,639. *E. ELSEY* and *S. T. KIRK*, 55, Chancery-lane, London. Manufacture of lace fabrics and apparatus therefor.  
3,668. *R. FOULDS*, 8, Quality-court, London. Circular shuttle box looms.\*

**8TH MARCH.**

3,686. *A. H. LEE*, 4, St. Ann's-square, Manchester. Production of patterns upon woven or other fabrics.\*  
3,687. *H. A. McCOLL*, 77, Chancery-lane, London. Drawings or designs on handkerchiefs or other woven fabrics.  
3,688. *E. ROTHWELL*, *W. A. ROTHWELL*, and *J. COLLIER*, 8, Quality-court, Chancery-lane. Picking motion of looms.  
3,696. *J. CULPAN*, Commercial-street, Halifax. Dobby or shedding motion in looms.  
3,699. *JOHN MUIR HETHERINGTON*, 1, St. James'-square, Manchester. Spinning mules.  
3,703. *W. NORTON* and *F. HINCHLIFFE*, 9, Old Bank chambers, Leeds. Dealing with hanks whilst being put through dyeing processes.  
3,725. *H. H. LAKE*, 45, Southampton-buildings, Middlesex. Artificial hair from vegetable fibre. (*K. Müller, J. Schwarz, and M. Scheid*, Germany.)

**SPECIFICATIONS PUBLISHED.**

1889.

3,236. *BULLOUGH*. Flat carding engines. 11d.  
3,399. *DREY*. Cutting welt-pile fabrics. 8d.  
3,933. *HARRIS*. Knitting machines. 1s. 1d.  
4,744. *WEBB*. Towelling. 8d.  
5,814. *FARRAN & CRAWFORD*. Cutting "pile" of fabrics. 11d.  
5,995. *FITZGERALD*. Bleaching agents. 6d.  
6,039. *GRIFFIN*. Flat gut belting. 4d.  
6,233. *MARSDEN & THOMPSON*. Looms. 8d.  
6,243. *RADCLIFFE*. Looms. 6d.  
6,289. *KIDDIER & ORS.* Knitted fabrics. 8d.  
6,290. *KIDDIEB & ORS.* Knitting machines. 6d.  
6,306. *MARSDEN*. Preparing, &c. cotton. 8d.  
6,327. *HURST*. Preparing cotton, &c. 8d.  
6,352. *DE PASS (Carbonnier)*. Spinning rollers. 4d.  
6,485. *WRIGLEY & PATTERSON*. Carding engines. 6d.  
6,486. *WRIGLEY & ORS.* Throstles, ring frames, &c. 6d.  
6,762. *BROUGHAM (Adt Bros)*. Bobbins. 8d.  
6,881. *JONES*. Reels, spools, &c. 6d.  
8,354. *NICOLL*. Buoyant ropes. 4d.  
10,846. *LINTON*. Printing trade marks, &c., on fabrics. 8d.  
12,908. *RATCLIFFE & RATCLIFFE*. Looms. 8d.

1890.

703. *HADDON (Bertrand-Leplat)*. Treating cotton. &c. 8d.  
741. *MORT*. Figured cloths. 6d.

**AMENDED SPECIFICATIONS.**

1887.

6,680.\* *ADGATE & ANR.* Circular knitting machines. 1s. 1d.  
7,267.\* *ADGATE & ANR.* Knitted fabrics. 8d.

1889.

6,691.\* *UPSDALE*. Glove, &c., fabrics. 11d.  
REPRINT (with alterations).

1888.

13,798. *IMRAY (Zimmer)*. Coloring matters. 6d.

**ABSTRACTS OF SPECIFICATIONS**

12 982. September 8, 1888. **Rollers for calendaring.** etc. *C. F. COCKSHOTT* and *J. E. JOWETT*, Thornton-road, Bradford.

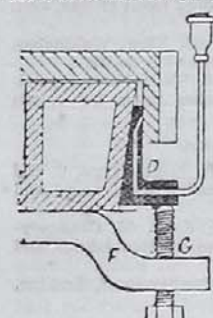
Relates to a method of an apparatus for removing pin-holes or sponginess, and for hardening the periphery of shells for pressing, calendaring, and other like rollers. Consists in employing a small narrow pressure roller, with rounded edges suitably mounted, together with anti-friction rollers, in a lathe in which the shell is carried. [8]d. Drawings.



**12,993.** September 8, 1888. **Wet spinning frames.** J. BARBOUR, Grove Mill, Ballast.

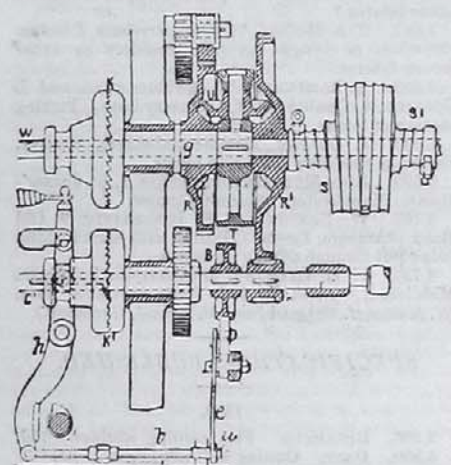
In order that a greater length of roving may be immersed in the water, it is passed several times round a series of loose pulleys of wood or other light material. [6d. Drawings.]

**13,031.** September 10, 1888. **Combing machines.** C. and J. R. HOVLE, Greengate, Keighley, Yorkshire.



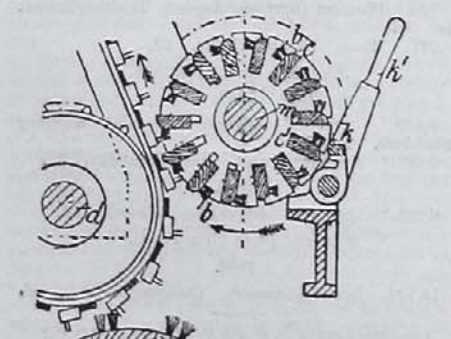
**Circular combing machines.**—In order that the rack circle may move steadily in a circular path, an adjustable wedge-shaped ring, or a series of curved plates D are mounted between it and the steam chest. The plates are adjusted and secured in position by screws G, some of which engage with screw-threaded holes in F, and others pass freely through apertures in F, and take into screw-threaded holes in D. They may also be provided with lubricating channels as shown. [6d.]

**12,961.** September 7, 1888. **Spinning-mules.** O. SCHUMMEL, Chemnitz, Saxony.



**Drawing-out apparatus.**—In order that the change in the speed of the carriage may be effected without altering the tension of the yarn, the two portions of the scroll-pulley by which the carriage is driven are made more nearly of equal size, and it is driven by means of differential gearing at a higher speed than is usual during the delivery of the yarn, and at a lower speed during the twisting and stretching thereof. The ordinary scroll driving pulley R, driven from the main shaft, rides loose upon a sleeve g, and the pulley R' rides loose upon the shaft W, and is driven through the clutch arrangement K; from the delivery roller-shaft C. The pulleys R, R' are provided with bevel teeth which engage with a bevel wheel v, which is mounted loosely upon a radial rod in the disc T keyed to the sleeve g. The scroll-pulley S is therefore driven through the clutch arrangement K by the disc T, the speed of which varies with the relative speeds of the pulleys R, R'; B is a brake-pulley, the strap of which is operated by means of a wedge-piece u and a lever system e, t, h. For effecting the change of speed at any other time than at the stoppage of delivery-rollers, the driving pulley of the pulley R' may be driven from the main shaft and disengaged at the required moment by means of counter or other suitable mechanism. The pulleys S may be combined with the pulleys S', over which pass ropes for steadying the motion of the carriage, the longitudinal shaft W in this case carrying both sets of pulleys. [8d.]

**13,045.** September 10, 1888. **Cleaning heckle pins.** J. M. GUNEVES, Strandtown, near Belfast, and T. LUCAS, 212, Grosvenor-road, Belfast.



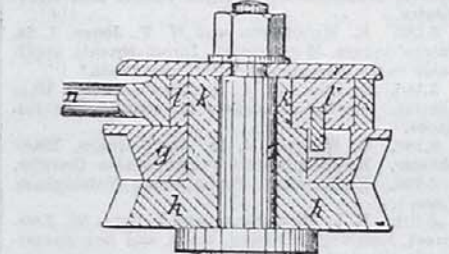
When the heckles have been stripped of tow they are further cleaned by rotary brushes b, mounted in radial slots c in the plates e, and moved in and out radially by means of cam grooves in fixed end plates. The plates c are driven from the shafts a, each heckle in its turn overtaking one of the brushes b, which at this time is moved inward so as to brush the dirt from the roots to the points of the pins. A is a series of pins, which may be brought into position by means of the handle h for cleaning the brushes b of tow, etc. Heckles when out of the machine may be cleaned in a similar manner by first mounting them upon an endless band. [8d.]

**13,086.** September 10, 1888. **Looms.** M. MACLEWRAITH, Warwick-road, Solihull, Birmingham, and A. L. K. GILCHRIST, 73, George-street, Manchester.

**Dobbies.**—Relates to portable shedding mechanism of the kind described in Specification No. 4346, A.D. 1876, for weaving twilled and other fancy pattern fabrics, such as stable cloths, muslins, lace, leno, or gauze. In this mechanism upright notched draw-plates a, from which the healds are operated by cords c, are mounted in oppositely reciprocating slotted cross-heads A, A', and are locked as required with the latter by catches d, which are set through kneed-needles G, G' from pattern cards I. The improvements consist (a) in rooking the cam-shaft E by a crank and link from one of the loom shafts, and in forming the cams D' with double grooves C for acting on rollers A<sub>2</sub> on the cross-heads; (b) in the construction of the notched plates a, and in arrangements for guiding them in one long slot in each cross-head, and for guiding the locking catches d; (c) in arrangements for mounting the rocking levers g which couple the upper and lower needles so as to admit of easily removing them, and in a special form of spring lever g<sub>1</sub> g<sub>2</sub> for pushing the lower needles in when the cards permit, the needles being arranged in one horizontal row at top and bottom; (d) in operating the rocking cylinder frame J by an arm which carries a bowl working in a groove formed in a cam on the outer end of the spindle E or in one of the cams D; (e) in arrangements for operating the locking bar c, consisting of a lever-frame e<sub>1</sub> c<sub>2</sub> formed with a loose curved lever d<sub>2</sub> over which a bowl d on the cam D' rides at times to release the locking bar, passing beneath it other times to allow the spring c<sub>1</sub> to draw the bar down between the levers g. [11d.]

**13,143.** September 11, 1888. **Spinning mules, etc.** G. PALMY, Bank Top Mill, Preston.

**Presenting gearing of the rollers.**—The threads are passed



to the rollers through thread guides carried by a traverse bar p operated by two eccentrics k, l, one within the other, and connected respectively to toothed wheels h, g, rotated by suitable gearing at slightly different rates, whereby the positions of the eccentrics k, l with regard to each other are altered and the throw of the traverse bar is varied. One of the toothed wheels g, h may conveniently be provided with one or two more teeth than the other, and both be rotated by a worm. In order to reduce the friction the traverse bar may be supported by a series of vertically swinging rods. In another arrangement described in the Provisional Specification, and specially applicable to roving frames and the like, the traverse of the thread guides is gradually decreased from the commencement to the completion of a "set" by connection with the lifting rail. [8d.]

**13,175.** September 12, 1888. **Dyeing, etc.** C. VANDERBRASSANS, 40, Rue Pascal, Paris.

Relates to apparatus for dyeing, washing, mordanting, carbonizing, and similarly treating textile and fibrous materials in all stages of preparation. [8d. Drawings.]

**13,192.** September 12, 1888. **Bleaching.** E. M. H. ANDREOLI, 63, Loughborough Park, Brixton, S.W.

Relates to improvements on the invention described in Specification No. 8,161, A.D. 1888. Consists in employing as electrodes, electric arc carbons fixed in a frame; or in employing electrodes prepared as follows:—The dust of logwood, or other hard wood, may be made into a paste with sugar, then compressed into slabs, or moulded into sticks, rods, etc., and carbonised; but preferably charcoal, previously crushed to fine powder and treated with hydrofluoric acid, is mixed with sugar solution, then submitted to hydraulic or steam pressure and carbonised. The cake produced is again pulverised and mixed with syrup, and after being moulded to the required form, the mixture is again carbonised. It is an important feature of the invention that the carbonising should be repeated at least once. The electrodes are preferably formed of prismatic or cylindrical rods, prepared as above, and afterwards coppered and tinned at their upper ends and formed into a grid by casting a lead coating on the top ends, along which a copper rod d is then soldered. The upper parts are then insulated, and the lower ends fixed in a wooden frame. [6d.]

**13,194.** September 12, 1888. **Un gumming and bleaching China grass, etc.** E. M. H. ANDREOLI, 63, Loughborough Park, Brixton, S.W.

The material, soaked in water and steamed, is boiled in an alkaline solution and washed. It may in some cases be treated at this stage with a fatty acid. It is then subjected to the action of a chloride solution decomposed by the passage of an electric current between charcoal electrodes. The material is finally thoroughly washed. [6d. No Drawings.]

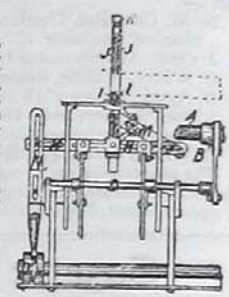
**13,232.** September 13, 1888. **Belts, etc.** F. S. BELLHOUSE, 1, Peel-street, and J. COOKSON, 21, New Cannon-street, both Manchester.

Consists in making belts, bandages, stockings, socks, pants, chest protectors, wristlets, singlets, sheets, and the like from

silks "noils," which are spun into yarn and then woven or knitted into a loose fabric. They are said to possess electrical properties. [6d. No Drawings.]

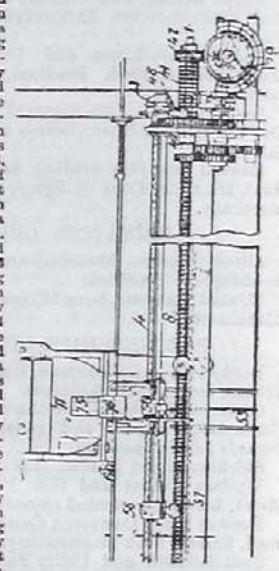
**13,233.** September 13, 1888. **Looms.** S. SMART and R. SKIBKOW, both of 18, New Cannon-street, Manchester, and W. SIMMONS, Manchester.

**Internal selvages of split-ups, shedding for.**—The lower shedding needles I are carried by a bar H worked laterally by a lever N from a cam o, and up and down from an eccentric B on the crank shaft A acting through a shaft D and suitable levers and links. The upper needles J are carried in a vertical slide K moved up and down by a lever M, or they may be carried by a bar similar to H and worked with the latter from a two-armed lever on the shaft D. [6d.]



**13,236.** September 13, 1888. **Sectional warping machines.** J. F. KIRK, Rashedale Iron Works, Huddersfield, and F. BRYNOTON, Melksham, Wiltshire.

Apparatus is described in which the section guide 60 is carried on a movable bed, consisting of two shafts 4 connected at the ends by bars and sliding in end standards. The guide carries rollers 71, 73, between which the section of warp is passed, as well as sockets 75, 76, for a reed; the feet of the guide are made flat with the shafts 4 when required, by means of a sliding hand lever 50. The latter is connected by a weighted cord 55 with a slide 56 carrying a screwed fork 57, which is lowered to fit a screw shaft 8. The shafts 4 and section guide are traversed by a screwed fork 46 connected to a lever on one of the shafts 4 and fitted to a screwed boss 41 on a spur wheel 40, which is driven by gearing from the warping mill shaft, the slide 56 being oppositely traversed by the shaft 8, which is also turned by special gearing. A width of section measuring apparatus driven by worm gearing 42 is set at the beginning of the operation, and is arranged to fall out of action and to return to zero when its index finger 29 comes against a catch, and also to disengage the gearing by which the shaft 8 is turned. Apparatus for measuring the length of the warp, and operated from the warping mill shaft, is provided at the left hand side of the machine, and is put into action by a clutch operated by the motion of the lever 50. The index of this apparatus is set at the commencement of the operation, and operates an alarm and stops the machine, through special mechanism, when the required length is wound. The hand lever 50 is then depressed, thereby disengaging the fork 46 from the boss 41 and allowing the shafts 4 to return to their normal positions by the action of a weight and the section guide to be brought back to the fork slide 56 by the weighted cord 55, as well as to put the width-measuring apparatus into gear. The above operations are then repeated. When the warp is completed the fork 56 must be released from the shaft 8 in order to return it and the section guide to the starting point. [11d.]

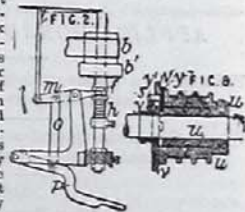


**13,253.** September 13, 1888. **Heckling machines.** J. GORDON, 41, Bridge-street, Ballymena, Antrim.

The heckle pins are cleaned automatically while the machine is at work by means of fixed brushes formed of metallic wire. [6d.]

**13,106.** September 11, 1888. **Twisting and winding machinery.** G. H. HOLDEN and J. ASHWORTH, both of Carr-street, Manchester.

**Stop-motion.**—In order that a greater number of drop-wires may be placed in a box of a given size, they are arranged in two or more rows in the swiveling frame, their lower ends being cranked if necessary to bring them in line with one another; and in order to effect the disengagement of heavy parts without employing heavy drop-wires, each drop-wire may be connected to a bent lever which is engaged by the rotating wiper. When a thread breaks, a spring rod l (Fig. 2) disengages a clutch arrangement connecting the loose driving-pulley b with the spindle, and also raises the top rollers through a lever system.



The clutch consists of a series of blocks or dies within the flange b<sub>1</sub> of the pulley, and normally forced into engagement therewith by means of a conical-shaped collar j which is forced upwards by a spring A. When the collar j is withdrawn the blocks are forced inward by a circular spring. All the parts may be returned to their working position by the lever system e, c, operated by the lever p.

The **drive roller** (Fig. 8) is mounted loosely on a bush v, and in a radial slot in the end is a spring bolt y carrying a pin y<sup>1</sup> which projects through an inclined slot in a ratchet wheel v loose upon the shaft. Normally the bolt engages with notches in the bush v and the whole revolves. When a thread breaks, however, a stop or detent, operated by any suitable stop-motion, engages with the teeth of the ratchet, and by reason of the inclined slot in the latter, the bolt is withdrawn and the roller ceases to rotate. [8d.]