

ly 2½ lb. weight. There is an iron fluted roller, marked F, furnished with a toothed wheel at each end, and a wooden one, G, covered with cloth, and over it a smooth leather. There is an assisting roller, H, of fluted iron. These rollers are supported by their axes, turning in the slit, marked 2, of the piece of wood marked M, (*fig. 2*) which is here separated from the end of the frame marked 8, to shew the rollers and wheelwork. The rollers G and F are squeezed together by the lever marked p, and its weight w (*fig. 3*). The roller H is pressed to G by its axis, acting upon the inclined plane marked x (*fig. 3*). There is a rubbing roller covered with woollen cloth, and on its axis is a small wheel, I, driven by the wheel, S. This roller rests upon the roller G, and by its motion prevents any dirt or fibres from adhering to it. There is a cloth, N, revolving over two rollers O, O, which has motion given to it from the wheel C, by means of another wheel P. This cloth moves at the same pace as the surface of the wheel A. There is a supporter, Y, of the axis of the wheels O, P, but it is removed, in order to shew them; it is fixed by its tenons in the mortises Z, Z. The roller B is kept in action by its endeavour to slip down the inclined plane at the top of the piece Y, *fig. 6*. thereby pressing against the revolving cylinder; and another piece, similar to this, must be understood to support the other end of the roller's axis. By the side of this revolving cloth is a table placed, of the same length and breadth as the cloth is, to which belong two smooth cloths or leathers, of the same size as the table. The machine being thus prepared, the attendant or workman must take a quantity of hemp, tow, flax, or wool, more or less, according to the fineness of the thread to be made, and lay or spread it evenly upon one of the smooth cloths on the table, then place it on the revolving cloth N, motion being communicated to the roller F, by wheel-work, as usual, from a water, horse, or other kind of mill, which wheel-work is communicated to the wheel Q, on whose axis is a nut, which turns the wheel C; and thereby the cylinder A moves, and with it all the rollers, by which motion the hemp, tow, flax, or wool, is drawn forward. The cloth turns down, but the hemp, tow, flax, or wool, go upon the cylinder A, under the roller B, and so forward under all the rollers D, D, D, then falls in between the rollers G, F, turns under the roller G, and over the roller H, which, as it gives the rollers hold of the hemp, tow, flax, or wool, in two places, enables them to draw forward the long fibres thereof, though many of them are to draw from under the marks 4 or 5 of the pressing rollers D; it then falls into a cannister, R, and as by the wheel-work the rollers F, G, H, moves three times faster than the cloth and cylinder, the sliver must be three times longer than when presented. By the time this is drawing, the other cloth is filled with hemp, tow, flax, or wool, as before, and laid upon the revolving roller, laying the hemp, tow, flax, or wool, over the end of the other, which goes forward as before, and thus a continued sliver is produced as long as the machine continues its motion. But in order that this sliver may come out of the cannister R, without entanglement, it must pass through

**YARN-MILL.** The following is the specification of a patent granted in 1787 to Mr Kendrew, and Mr Porthoué of Darlington, for a mill, upon new principles, for spinning yarn from hemp, tow, flax, or wool. It may be worked by water, or a horse-mill, or in any other way, and is made and used in the following manner: There is a cylinder, marked A in *Pl. CCCXLVIII*, *fig. 1*. 3 feet diameter, and 10 inches broad, made of dry wood or metal, turned true, and covered on its circumference with a smooth leather, upon which are placed the rollers, marked D, D, D, &c. covered with leather, and supported in their situations by the slits in the covered piece of wood, K, in which the iron axes of the rollers turn, but suffers them to press on the wheel A. There must be another piece similar to the above to support the other end of the rollers. These rollers are of different weights. The upper roller, D I, is two stone, the rest decreasing to the last, which is on-

an

M<sup>r</sup> Barma's Machine for Dressing Woollen-Cloth &c.

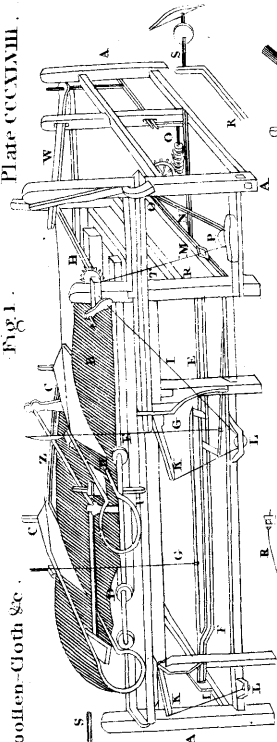
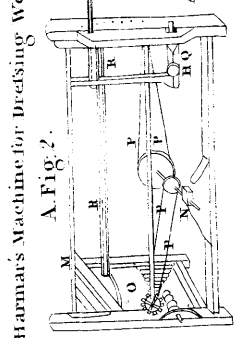


Fig. 1.



A Fig. 2.

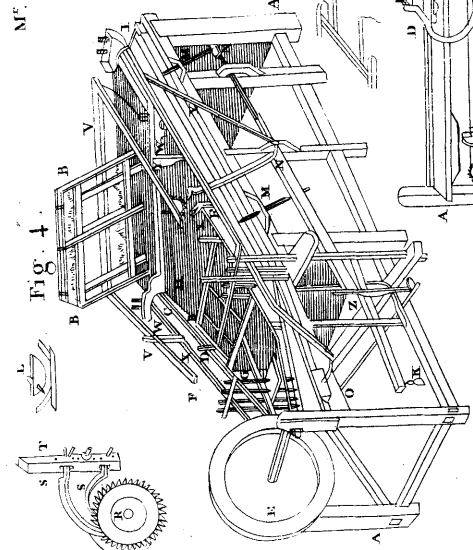


Fig. 4.

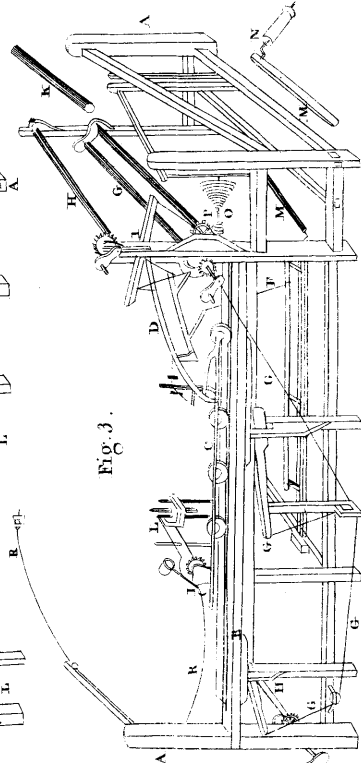
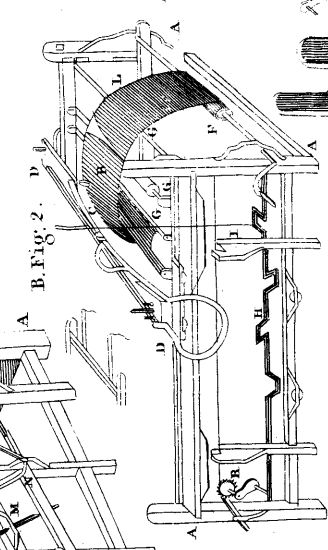


Fig. 3.



B Fig. 2.

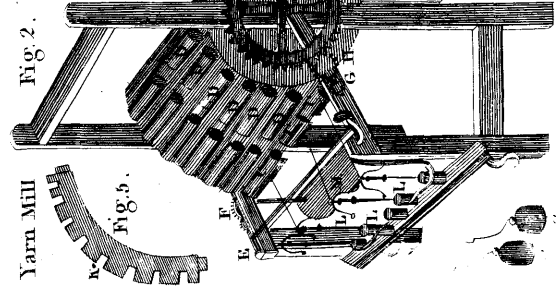


Fig. 2.

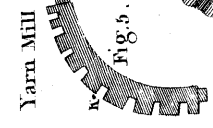


Fig. 5.

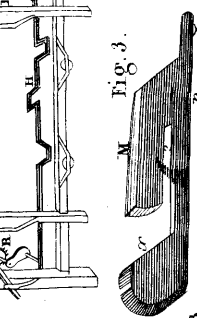


Fig. 3.

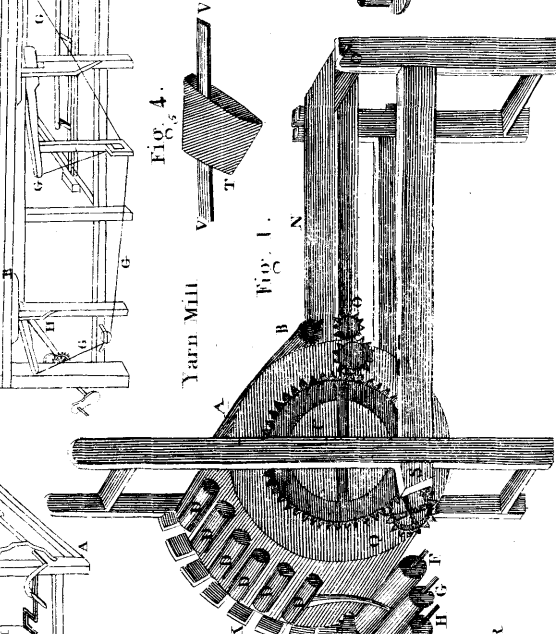


Fig. 4.

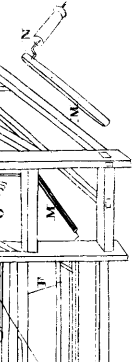


Fig. 1.

Wool-combing

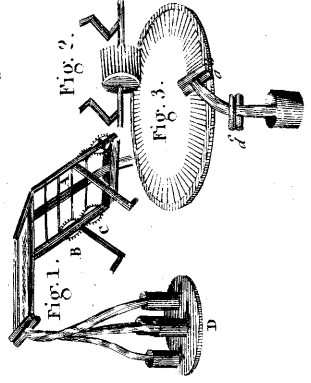


Fig. 1.

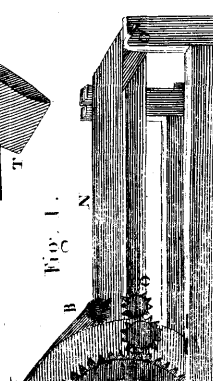


Fig. 2.

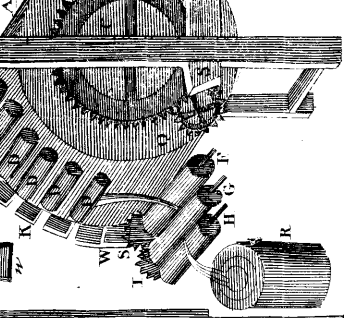


Fig. 3.

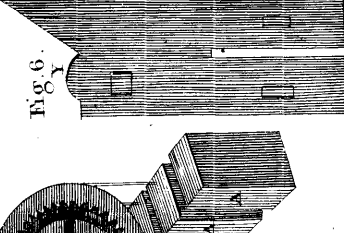


Fig. 6.

Black woodcut.

an instrument marked *s*, (*fig. 4.*) placed over the rollers *F, G*, its open side *T*, to the cylinder at mark *4*, supported by its ends *V, V*, in the flits *W*, of the before described pieces marked *K*, *fig. 1.* and *5.* The aperture *X* is so small as to press the fibres close to each other in their passage through it previous to their passing the rollers, by which means they remain pressed side by side in the siver, and will not entangle. These thick sivers are drawn smaller by a similar process, and in the same manner as used for cotton, but the machines for drawing are all of the same structure as the above, except that they have no revolving cloth. The siver is applied to the cylinder under the roller *B*, which draws it forward under all the rollers, as before described, drawing it out, or lengthening it, every fresh machine through which it passes, till it be small enough for the spinning machine. The cylinders are made less in diameter, according to the different smallness of the siver intended to be drawn upon them at the first; whilst the siver is at its greatest thickness, the cylinder is required to be three feet diameter, as above described, the next rather less, and so on to the last, which is only two feet. The aperture of the bottom of the contractor belonging to each machine is also made one third part smaller than another in succession, from the greatest to the smallest cylinder; as also the drawing rollers *F, G, H* are farthest from the pressing roller *D* in the longest cylinder, and nearest at the smallest cylinder. At the largest cylinder the distance is about 9 inches, and the smallest about 4 inches; but their distance in all cases cannot be fixed, as it depends on the different length of the fibres of the hemp, tow, flax, or wool; long ones requiring the distances mentioned, and short ones requiring the distances much shorter than is here specified. The following letters are in the machine *fig. 2.* The spinning machine, as to its drawing principle, is the same as the drawing machine. The sivers are presented to it in canisters *A*, and drawn over a cylinder *B*, covered with rollers *D, D, D, D*. The fibres which are to form the thread are drawn from the cylinder by the rollers *C*, the under roller of which is made of fluted iron, the other of wood covered with leather; they move 6 or 8 times faster than the cylinder *B*; are enabled to draw the hemp, tow, flax, or wool, forward from under the pressing rollers *D, D, D*, by being squeezed together with the weights and crooks *a, a*, locked to the small part of the rollers *C*. There is a belt of smooth cloth *E*, moving on two rollers, which are turned by the wheel *F*, on the axis of the fluted roller; at the opposite end of which *G*, is a nut, which turns the wheel *H*, on whose axis is another nut, turning the wheel *I*, and thereby the cylinder *B*, with all its rollers. These rollers move in curved pieces of wood or metal *K*, *fig. 5.* which, to prevent confusion, are not represented in their places: they have flits in them, in which the rollers' axes are guided, but so deep as at all times to suffer the rollers to press upon the cylinder. These rollers are covered with cloth and leather. The top roller is about 10 lb. weight, decreasing to the sixth roller, which is only about 1 lb. weight: the yarn

is turned by the spindles *L*, and rubbed over the wet cloth belt if spinning linen yarn, but if spinning worsted yarn the belt must be removed, that it may not touch it as it passes to the spool, which it coils round as fast as the rollers let it out. The spindles *L*, are turned by a belt from the wheel *M*, which derives its motion from the mill, and by a wheel on its axis communicates it to the roller under *C* by the wheel *F*, and so to the rest, as above described. The hemp, tow, flax, or wool, is twined in the same manner as cotton is by mills.