gig-mills, the cylinder was completely bristled with the teazles ; but in the modern mills they are arranged in lon­gitudinal frames parallel to the axis of the cylinder, with equal spaces between each, like the bars of an immense reel. The mode in which the cloth is stretched on thc beams is shown in the an­nexed diagram, which is a section view of the beams and cylinders, without the frame-work which supports the machine. The arrows show the direction of the cloth and of the cylinder, on the outer circumference of which are seen the ends of the frames in which the teazles are made fast. It will now be easily under­stood that, by the rapid re­volution of the cylinder, and the slower motion of the cloth in a contrary direc­tion, the loose fibres of the wool are brought to the surface. The longitudinal teazle-frames can be re­moved from the cylinder at pleasure, and when the tea­zles become clogged with wool, they are removed and cleaned with a comb by children.

The most recent invention of a gig-mill with metallic teazles is that of Mr Atkinson ; but we have never had the good fortune to see it in operation, nor do we know what success it has been attended with. It does not differ ma­terially from the gig-mill just described. A series of lon­gitudinal teazle-cards takes the place of the teazles ; these teazle-cards rest on a spring, which gives them elasticity, and prevents any damage to the cloth. The teeth incline slightly in the direction of the line of motion, and they are cleaned by a wheel similar to the cleaner of a wool-card. Dr Ure states that the pile is more perfectly raised by this machine, and the nap of the cloth is much softer. The superiority of the teazle over wires arises from the tendency of the former to break off when they meet with any knot or inequality, which the metallic teazle-cards would tear out. The spring with which Mr Atkinson’s gig-mill is fitted may perhaps correct this.

The mode of winding the cloth from one roller to another has also varied from time to time, still varies in different factories, and has even been the subject of a patent by Mr Walker of Mill-Shaw, in the township of Beeston, near Leeds. Mr Walker’s improvement consists of five rollers instead of three. Two are immediately over the cylinder. The lower one brings the cloth close to it. The effect of this lower roller is to cause the cloth to be operated upon by a greater number of the rows of teazles, as the cloth touches the cylinder for about one fifth of its circumference. It then passes round another roller and ascends to a second pair, round one of which it is wound. The dotted lines in the above figure show this improvement.

When the fibre has thus been torn to the surface, the pile so raised is cropped or sheared. This, like all the other operations of cloth-making, was formerly performed by hand, a large pair of shears being employed for the purpose. But the disposition to apply machinery to every process of ma­nufacture was not here neglected ; and in the early part of this century a machine was invented, in which the shears were retained, but all their motions were regulated by ma­chinery. The cloth was stretched horizontally on a frame by means of two cloth beams or rollers situated at each end at the lower part of the frame. Two pair of shears

were then so fixed as to clip the surface of the cloth, being moved by two small cranks. Upon this first machine there have been many improvements ; but it will be sufficient to describe the most recent, which has the merit of being ex­tremely simple, and will probably supersede all others. It is the invention of Mr George Oldland of Hilsley in Glouces­tershire, and was patented in 1832. It will be readily un­derstood from the annexed figure, which represents the machine in operation against a piece of cloth. The machine consists of a fixed semicircular rack, within or rather behind which is a cutting edge, called by the inventor a *ledger-blade ;* and a large revolving wheel, armed with eight small cutting discs, which, being in con­tact with the ledger-blade, form when in motion a se­ries of far more delicate shears than have hitherto been ap­plied to the process of cloth-shearing.

It will be observed that each cutting disc has a toothed pinion, working in the semicircular rack, which, as the larger wheel revolves, imparts to the cutting discs an in­dependent rotary motion, in addition to their revolution with the large wheel. These motions have not inaptly been likened to those of a planet round its axis and its orbit. The other machine in use consists of an iron cylinder, around which is a spiral cutting blade, which is made to revolve with great rapidity, cutting the pile of the cloth immediately in contact beneath it, the cloth being stretched in a longitudinal moving frame.

Superfine cloths are cut and raised several times. In the west of England the first raising is called *roughing,* in which process the cloth is torn by the teazles both ways. After being sheared, it is subjected to the gig-mill in one direction only, which is called *moving.* It is afterwards cut and teazled several times.

In most cases the cloth is subjected to an operation which imparts great lustre to it, and at the same time pre­vents its spotting when used. This operation is called rol­ler-boiling, or patenting. The cloth is tightly wound round rollers, and is immersed in water heated to 180° of Fah­renheit for twenty-four hours, when it is once more stretch­ed upon the tenters and dried. Mr William Hirst of Leeds, a great improver of the cloth-manufacture, finding the long exposure to heat injurious, proposed an alternate and intermitted immersion in hot and cold water, and his method is said to have been attended with great success.

The cloth is now removed to the brushing machine, a system of brushes affixed to cylinders. In its passage the cloth is exposed to steam, which escapes in minute jets from a copper box, extending the whole length of the ma­chine. For the purpose of brushing, the cloth is made into an endless web by stitching the ends together, and the brush­ing is continued as long as may be deemed necessary.

Before the final brushing, mozing, or finishing, is given to it, however, it is subjected to a further examination be­fore the light and on the surface, and is picked, fine-drawn, and marked. The picking is to remove all blemishes, si­milar to the process of burling, already described ; the fine- drawing is to close any minute hole or break in the fabric ; and the marking is the working in, with white or yellow silk, a word indicative of the quality and number of the piece, such as Saxony, extra superfine, and so forth.

The pile is again brushed, and after the final dressing is thus given to it, it is pressed in a hydraulic press. Be­tween each fold of the cloth is placed a polished pressing