WOOL-CARDING MACHINERY.

We publish on pages 168 and 169, drawings of wool-carding machinery, manufactured by the Sachsische Maschinen-fabrik, of Chemnitz. This firm has devoted itself with much success to the perfecting of this class of machinery, and the engravings we have prepared show a selection of three machines, and their various attachments, all of the most recent form. Fig. 1 — a scribbler — shows the first carder for opening the wool, and transforming it into a light mass, in which the fibres are laid parallel. This machine comprises a feeding apparatus, special rollers for preparing the wool, and an apparatus for laying the fibres. The feeding apparatus consists, as shown in the drawing, of a receiver A for containing the wool, of a mechanical device a B D for extracting it in small quantities, which fall into a cup C, mounted on a combination of levers c, h, i, and being moved by the gearing q r, the cam t, and the lever u. So actuated, a inclined position is periodically given to C, when it is filled with wool and this movement throws the wool at first upon an inclined fixed table, and afterwards upon an endless platform. By means of the feeding rollers F the wool is led into the machine. This mode of feeding is very efficient, and its delivery is quite regular, because the cup C receives a given quantity of wool in a given time, and any excess is rejected, and does not enter the machine. This regulation is effected by means of the weight of the wool itself, and by the counting wheels. The wool passes by the carrying cylinder to the drum, which revolves in connexion with five pairs of workers H, and cleaners I.

The large roller K raises the wool a little, so that the comb L may receive all the wool from the drum. The vibrating comb, worked by the lever and connecting rod O, separates the wool, and forms it into a light fleece, and it then passes off by the roller, shown in the engraving upon machine Fig. 2. This machine is fitted with a so-called "diagonal" feeding apparatus. It contains a guide moved by means of an endless band l running over the pulleys m n. Over the belt is a bar c, on which is mounted, free to slide, an arm d, the lower part of which is formed with a slot. To the band is attached a small finger which passes through the slot, and gives motion to the arm d, and at the bottom of this is placed a bracket carrying the gauge a and the double elliptical ring b. The band of fleece is led through a and b b on the endless table. As will be seen from Fig. 3 this apparatus is placed diagonally with regard to the endless table, and the reciprocal movement insures the band of wool being placed also diagonally on the feed table, and it does not enter into the machine in the direction of the length of the fibre, but at an angle to it. By this means the amount of separation of the fibres can be increased, and their position with regard to each other equalised. The drum in this machine is also connected with five pairs of working rollers and cleaners w x, with a cylinder and doffer F. The oscillating comb e separates the fibres of the wool, and forms a fleece ready to be led upon the third machine, Fig. 4.

This carding engine takes the wool from the previous machine upon the endless table E. The drum works also in connexion with five pairs of small rollers, and the large cylinder y lifts the wool from the drum to the doffer, while the oscillating comb (driven by a pulley a and eccentric c on the shaft b) separates the wool from the doffer, and the dividing apparatus cuts the fleece into thirty cardings, which are compressed and rolled by means of three cylinders, which are driven by the eccentrics f, g, i, k, and e. The fibres remaining on both sides of the doffer are taken off by means of the small combs. This continuous carding engine is supplied with the cleaning cylinders R R for clearing the drum. The whole of the machines are commendable for the simplicity of their arrangements, and the solidity of their work.

SCHMITZ'S REVOLVING FIREBARS.

We are indebted to our contemporary the *Revue Industrielle* for the accompanying illustration of Schmitz's firebars, recently introduced into France with good results. As will be seen it consists simply of a series of straight tubes, placed either singly or coupled together, and pierced with openings of a suitable form. Means are provided by which these tubular bars can be caused to revolve. It will be seen that the tubes rest upon transverse bearers also cylindrical and hollow, and longitudinally they are supported by a cast-iron plate fixed under the furnace-door, and formed with a projection upon which the tubes take their bearing, either by a groove as in the first and third types, Figs. 3 and 5, or against a ring as in the second type shown in Fig. 4. The bars are turned by means of a key that is introduced into the end of the bar, which is fitted with a ferrule having a six-sided aperture as shown.

The first application of this system was made to a 12 horse power boiler, in which the steam was maintained by means of coke dust and slack, containing 25 per cent. of cinders. This boiler belongs to the Parisian Gas Company, which has a deserved reputation for investigating new and promising inventions. The success of their first experiments was so great that now some hundreds of these bars are employed by the gas company, so that the arrangement has passed from the phase of experiment into that of actual and large practice.

It is claimed that by the use of the Schmitz bars, the work of firing is rendered much less difficult, while a thick fire (from 8 in. to 10 in.) can be maintained economically. The draught is regulated for a given consumption of fuel, and the front of the ash-pit may be closed, because sufficient air can be admitted through the open ends of the tubes. The inside of these tubes is always visible to the fireman, who can at once see when any of the openings are choked. When this takes place he is enabled, by partially turning the tube, to present a new surface to the fire, while he is easily able to clear those passages which have been closed. In turning the tubes the ashes and other *débris* are precipitated into the ash-pit, and as shown in the second and third types, Figs. 4, 5, the bars are furnished with a spiral projection to assist in breaking up clinkers, &c.

The following are the results of this trial:

	Ordinary Furnace.	Schmitz's Bars.
	lb.	lb.
Water evaporated per pound of coal	4.678	5 563
Water evaporated per hour per square foot of heating surface	1.321	1.322
Coal burnt per hour per square foot of grate	6.79	5.70
Coal burnt per hour per square foot of heating surface	.283	.238

From trials made with a boiler in the Passy Gas Works, an economy of 26 per cent. was claimed for the apparatus, while the fuel employed was of such a nature that it could scarcely have been employed in an ordinary furnace.

NEEDED INVENTIONS.

The *Sewing Machine Journal* gives the following list of inventions in which great improvements can be made. There is great need it says of these specified, and also great room for advancement. Doubtless a fortune can be made on them if properly managed:

1. A Ruffler which can be set to gather a given fulness.
2. A simple Embroiderer.
3. An adjustable scroll Binder which will not stretch the binding.
4. A practical adjustable Hemmer, from the smallest size to an inch wide.
5. A Rotary Shuttle Sewing Machine, which will not twist or untwist the thread, and which will sew with great rapidity.
6. A practical Tuck Folder.
7. A Sewing Machine which will have in its working parts the different attachments which can be thrown in gear with some working part of the machine when the attachment is required.
8. Motive power.
9. A good Needle Threader.
10. A glass Oil Bottle which can be sold cheap, and used to oil the machine instead of the oil can. It must be made so that the oil can be forced out.