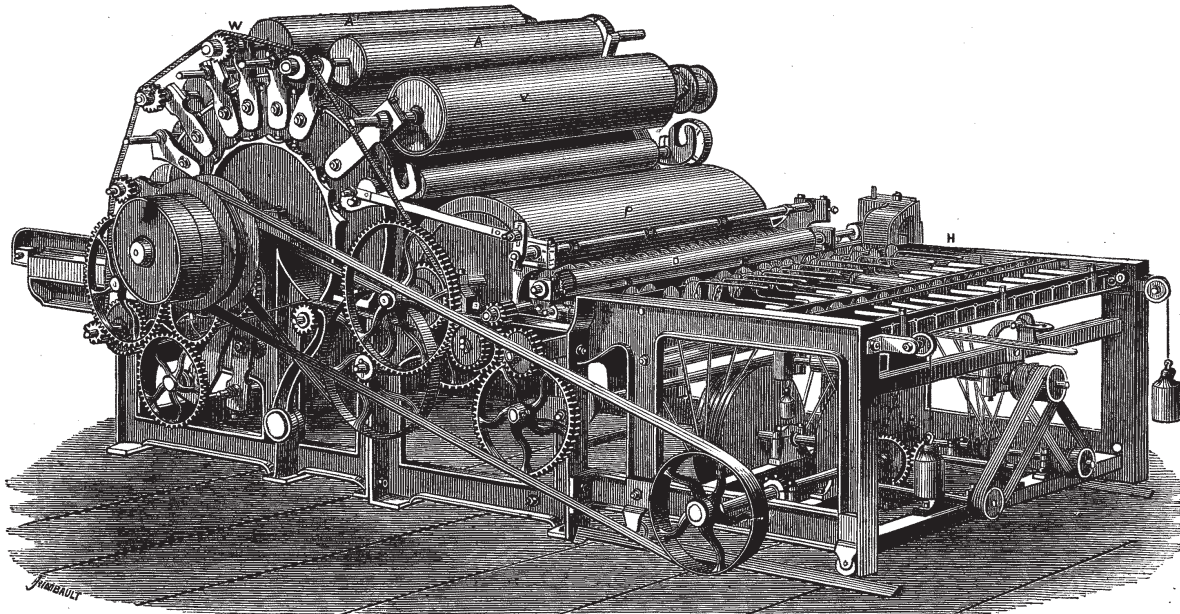


CONTINUOUS CARDING AND SPINNING MACHINE.

CONSTRUCTED BY MESSRS. OSCAR SCHIMMEL AND CO., CHEMNITZ.



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

By DR. H. GROTHE.

REFERRING to our article on "Special Machinery for the Preparation of Wool" (No. XVII., page 18, ante), we have to speak here respecting a carding machine exhibited at Vienna by Messrs. Oscar Schimmel and Co., of Chemnitz, which has fixed to it a contrivance for spinning coarse threads, such as carpet yarns, &c. This arrangement has been almost entirely substituted for the former system of breakers, continuous carding machines, and spinning machines, on account of the continuous carding machine itself acting as spinning machine. The continuous carding machine is charged with the fleece, and produces the finished yarn. This carding machine, an illustration of which we publish above, is provided, like the drum of the ordinary carding machine, with the clearer W and the worker A, with the doffing cylinder V and the porcupine P, from which the fleece is taken off by a comb, and is transferred to a dividing roller which separates the fleece in 12 or 14 strips, which are twisted together by an arrangement of three rollers. The threads prepared in this manner are then taken off by the spinning apparatus, which is arranged in such a manner that next to the twisting rollers a tube with two arms and a flyer is placed. The thread passing through this tube is twisted, and is led through a hole at the side of the tube round one of the arms, whence it is taken off by the spool, which is put in rotation in the usual manner. With 120 revolutions of the flyers per minute, 20 minutes are required for the filling of the spools. The fixing and taking off of the spools occupies about five minutes, and each set of spindles producing for example 4 lb. of No. 2 yarn, the production per hour is about 10 lb. It is best to spin No. 2 yarn with these machines, because higher numbers require too great a speed for the spindles.

Without saying at present any more about other constructions of carding machines, we pass on to the continuous wool spinning machine of John Avery, which was exhibited in the American section of the Machinery Hall, and which excited great admiration among woollen manufacturers on account of its seeming to accomplish in a very small space, and with great economy of construction, a better purpose than machines of ordinary types. Avery's spinning machine for corded yarn is more similar to the original spinning machine of Hargreaves than any other construction so far introduced. It appears that in this sense Avery's invention shows a retrocession, but in reality it must be acknowledged that it is a progress. Avery's invention is not only an important contribution towards the long sought

solution to the problem of effecting the continuous spinning of corded yarns, but it also utilises parts of former machines, which are themselves of value. We know that four or five years ago the

apparatus is fixed and the spindles movable; however, these experiments gave satisfactory results only for ordinary wool. Avery must have carefully observed Hargreave's nipping apparatus, and it is

Fig. 1.

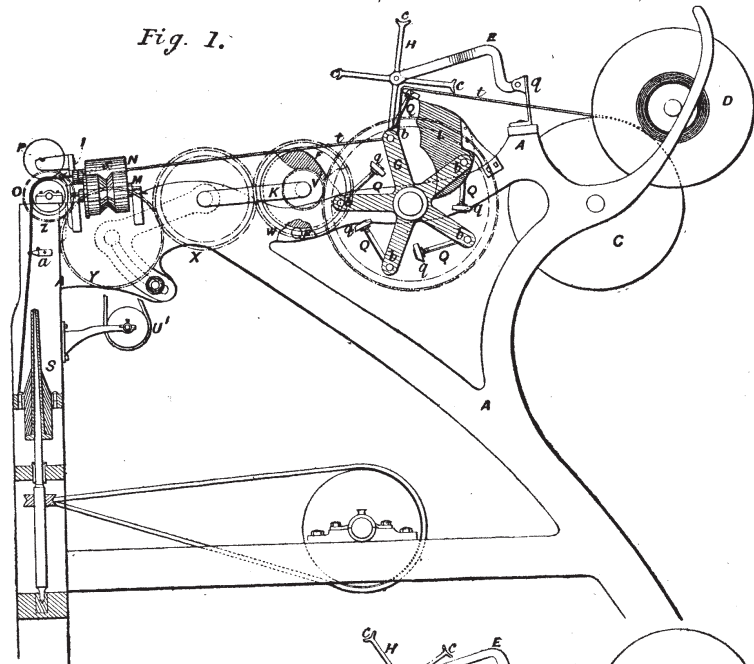
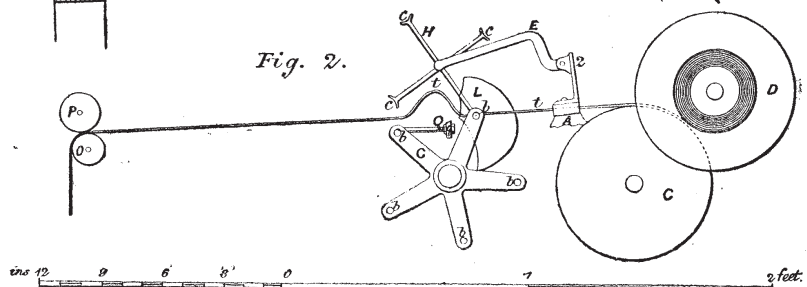


Fig. 2.



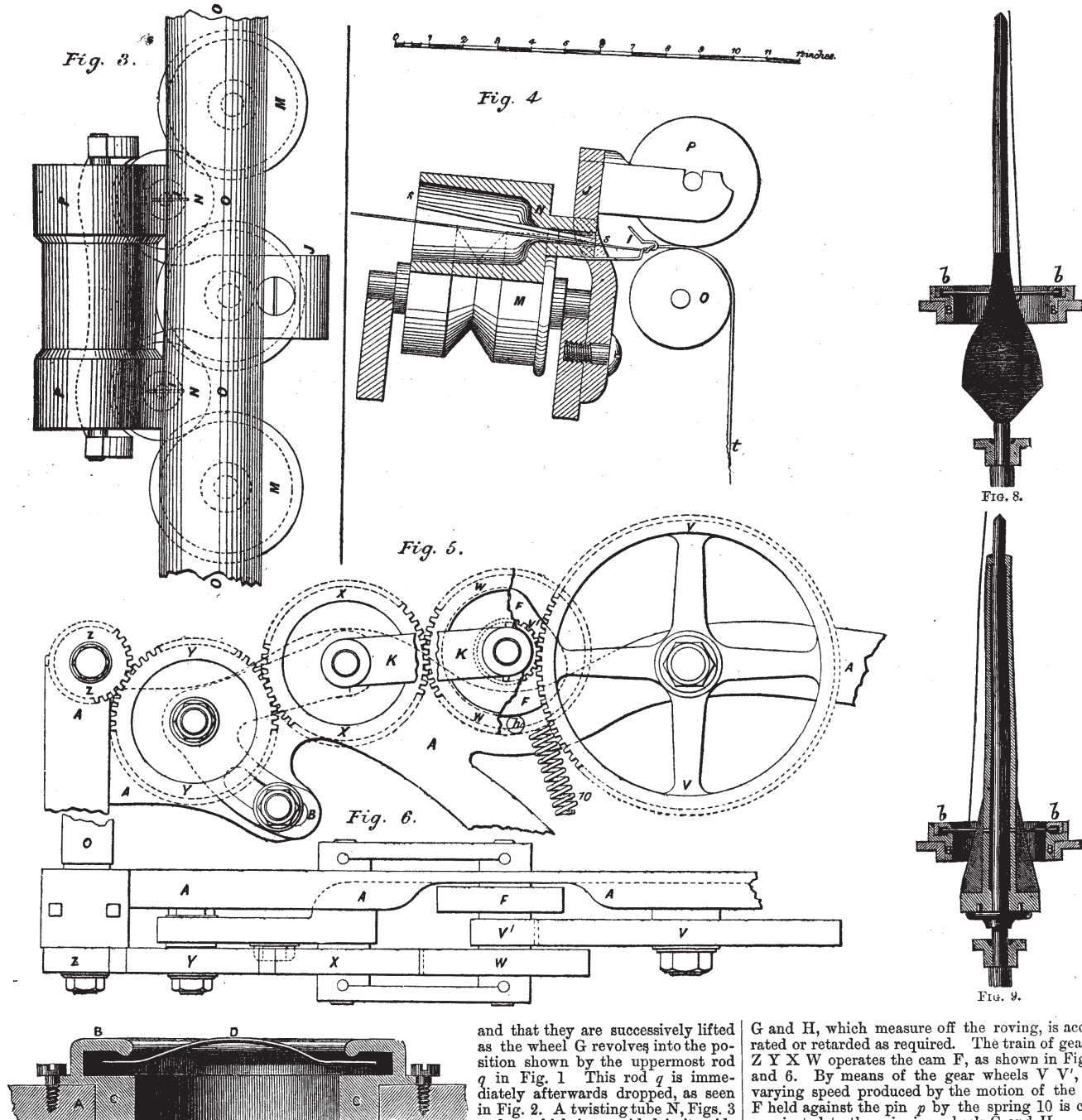
AVERY'S CONTINUOUS WOOL-SPINNING MACHINERY.

too-willingly rejected simple arrangements of Hargreave's machine had to be again adopted, that, indeed, nearly the whole of this machine was reproduced, but with the difference that the nipping

evident that he decided to remove the objections to which it is open.

Avery's spinning machine, illustrations of which we publish on the present and opposite pages, con-

EVERY'S WOOL-SPINNING MACHINE.



sists of the frame A (Fig. 1) with the drum C, by the revolution of which the roving is fed or delivered from the spool D which rests on the drum C, the latter revolving with the same circumferential velocity as the skeleton wheel G. Between the spokes of this wheel a series of rods, the ends of which are shown at *b*, extend lengthwise, or parallel to its axis, and engage with and give motion to semi-cylindrical depressions *c* in the arms of a skeleton wheel H, which rests by these arms on the rods *b* of the wheel G. As the wheel H rises and falls in its motion it is guided and held by the arm or bar E, which is hinged to the support *q*. Arms Q are attached to the wheel G, and are hinged at one end to admit of easy motion, whilst they carry at the other ends rods *q*, extending lengthwise over the wheel G, and passing under the wheel H. A peculiar arrangement in Avery's machine is that by the cam L, the projecting ends of the rods *q* are engaged,

and that they are successively lifted as the wheel G revolves into the position shown by the uppermost rod *q* in Fig. 1. This rod *q* is immediately afterwards dropped, as seen in Fig. 2. A twisting tube N, Figs. 3 and 4, which is provided in its side with a diagonal slit *s*, rests on small pulleys, one of which is shown at M, so that it can easily be removed and replaced without stopping the machine; the tube receives a rotary motion from being in contact with the surfaces of the pulleys M, which revolve in bearings attached to the frame, and which are driven from the drum U' Fig. 1, underneath. Each twisting tube carries at its end a wire I, made into a hook around which the roving passes as it goes to the rolls O, P, as shown in Fig. 4. The large roll P rests on the small roll O, which is driven with such a speed that the roving passing between P and O is drawn forward as required. This large roll P is short, and is supported on independent bearings in such a manner that the roving can be passed under either end without removing the roll, as shown in Fig. 3. The variation in the rate of extension is obtained by a cam F (Figs. 5 and 6) driven by gearing from the roll O, so that the speed of the nipping wheels

G and H, which measure off the roving, is accelerated or retarded as required. The train of gearing Z Y X W operates the cam F, as shown in Figs. 5 and 6. By means of the gear wheels V V', the varying speed produced by the motion of the cam F held against the pin *p* by the spring 10 is communicated to the gripping wheels G and H. Avery's spinning machine operates in the following manner: by the revolution of the drum C the roving is delivered to the wheels G and H, by which it is nipped at certain intervals by the action of the rods *b* and the arms *c*. In this way new portions of the roving are successively delivered into the draft space in order to be twisted by the tube N and to be drawn by the rollers O and P. The cam L lifting the rods *q* Fig. 1, the roving must pass over the rods *q*, and under the arms *c*, so that the new supply of roving delivered is longer than the direct distance from one rod *b* to the next one. Each rod *q* drops just as the preceding arm *c* rises, whence the new supply of roving hangs loose till enough twist has entered this new portion, before the drawing or longitudinal extension begins in it, thus giving the weaker portions strength, and preventing breaking, while the entire portion of new roving is being drawn to the required fineness. Immediately after the rod *q* is released by the cam L, the speed of

the nipping wheels G and H is retarded by the operation of the cam F, and is then gradually accelerated until the yarn is drawn to the required fineness. The speed is now again diminished, and a new portion of roving is delivered by the wheels G and H. The variation in fineness is obtained by the substitution of other gear wheels for the wheel Z.

As the roving is delivered from the nipping wheels G and H, it is passed through the twisting tube N, and around the wire I, in such a manner that it is grasped with sufficient firmness to insure its revolving with the tube N. The point of the wire I is brought as close as possible to the point of contact of the drawing roll O with the roll P, so that the twist imparted to the roving by the revolution of the tube N is retained as near as possible to the point where the drawing rolls are tangential to each other, in order that the strength of the roving may allow of its being drawn without breaking.

Besides the peculiar and original general construction of this machine, the arrangement of the spindles is also worthy of special notice. This has not been invented by Avery, but is Potter's patent acquired only for Avery's spinning machines. These spindles are shown in Figs. 7, 8, and 9. Fig. 7 shows, to an enlarged scale, the ring C, fastened to the bed A, through the centre of which ring the spindle passes, as shown in Figs. 8 and 9. The ring receives the same motion as the bed A, which moves up and down; and the upper part of the ring is provided with the flange B for the support of the wire D. The thread, coming from the drawing roll, passes round the wire D, whence it is led to the spool on the spindle. The simple arrangement for the fastening of the spool upon the disc of the spindle will be seen from Fig. 9.

If the first spinning machine on Avery's system exhibited at Vienna required a few improvements, and did not spin very uniformly, the further development of the system will certainly correct this fault, and the machine is one which in our opinion possesses great importance, and is calculated to greatly simplify the process of spinning. The machine promises to have a great future, and it has been patented in all countries, even in *Prussia*, and that is saying a good deal.

---