

drainage from the range of hills running in a north-easterly direction from Gakdoul towards El Fouragh.

Following the river bed from its wells, it is seen to take a bend to the west, while on the east it receives the drainage from the hill range just mentioned. The principal drainage, however, runs towards that bend of the river which turns westward, near the hills. Following the base of a range of a sandstone hills for nearly half a mile, it suddenly sweeps round in a northerly direction, and passing through a gorge, enters a plain where vegetation is as abundant as at Gakdoul. The hills of sandstone and porphyry which surround this plain, provide an immense watershed, which pours from seven or eight mountain torrents into basins, and thence into the river bed of El Fouragh, where it is gradually absorbed into the desert sand further south, or evaporated by the heat.

The wells of Abou Deleah lie close to the line of the proposed railway. They are sunk in the same manner as those just described, but as the soil does not stand so well, they are constantly falling in, and have, therefore, very frequently to be reconstructed. The water at this spot is excellent for drinking, and the supply is good, having failed like that of El Fouragh only once during the last thirty years. Being on the camel route to El Metemeh, the wells are constantly visited by caravans. They also form a favourite watering-place for the herds and flocks of the Arabs.

The well of El Shabocat is about 7 miles from El Metemeh, and is also upon the camel route.

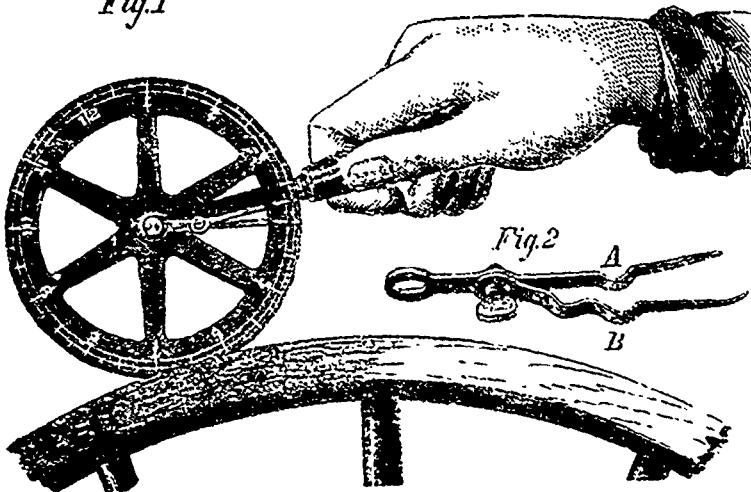
BLACKSMITH'S MEASURING WHEEL.

Mr. Thomas B. Way, of Springfield, Ohio, is the inventor of the device herewith illustrated, for measuring the circumference of wheels and the length of the iron from which tyres therefore are to be made. The peculiarity of the apparatus consists in an extra pointer pivoted to the hand which indicates the wheel measure, for the purpose of deducting from the latter the amount to be allowed for expansion of the metal.

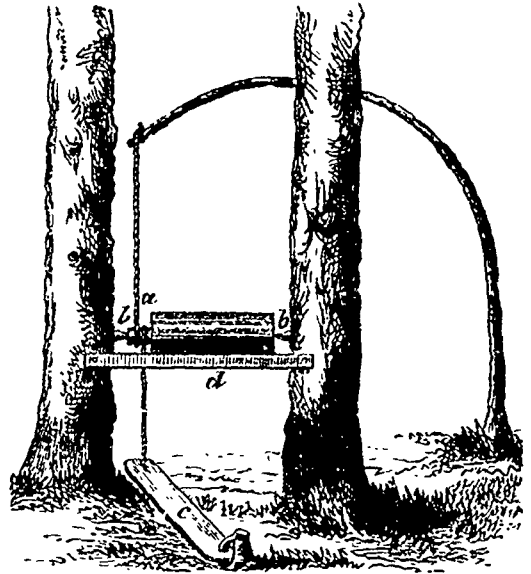
The wheel shown revolves freely on its axle, to which, however, the hand A. is rigidly affixed. The pointer B, is secured to the hand A, by a screw, as shown in Fig. 2, so that its end may be set at any desired distance from that of its support. The device is applied and carried around the wheel to be measured, as represented in Fig. 1, where the hand A. indicates the length of circumference passed over. The pointer B, is then fastened with its end at a distance to one side of the hand equal to the amount of expansion of the iron. The apparatus is afterward carried over the tyre, which is cut at the point indicated by B.

The invention may also be employed by coopers for measuring hoops, in which case the extra pointer may be used to indicate the allowance for lap.

Fig. 1



BLACKSMITH'S MEASURING WHEEL.



AN ANCIENT LATHE.

A correspondent writes to *Engineering* as follows concerning the above exhibit at Vienna by the Austrian Ministry of Commerce and Agriculture:

"Besides many interesting objects, we there find turned objects of wood, such as wooden glasses, bottles, basins &c., manufactured by the Huculen, the remnants of an old Asiatic nation which had settled at the time of the general migration of nations in the remotest part of Galicia in the dense forests of the Carpathians. These people manufacture the articles named above, and the instrument they are using for turning them is worth noticing, seeing that it has been employed unaltered since times immemorial. If a Hucule wants to manufacture a turned basin, bottle, &c., he arms himself with a hatchet, a chisel and a rope, and enters the dense forest which surrounds all human habitations in his part of the country. After having cut the tree out, of which he wants to manufacture the desired articles, he looks round for two trees of about 1 ft. or 2 ft. diameter, and sufficiently close together for his purpose. But it is an essential point in selecting these trees that a young maple or beech should also grow near at hand. Having found this necessary combination for the work to be done, the Hucule makes two holes at a proper height in the two trees, and inserts in these opposite holes maple cones, serving as dead centres. One of these cones is fixed, and the other removable. In the annexed sketch of this arrangement these cones are marked *b b*. The wood-blank to be turned is then prepared with the hatchet, so as to be fixed between the centres, and is fitted at one end with a small cylindrical part, *a*, to take up the rope for giving a rotary movement to the piece of work.

The rope is then taken two or three times round the small cylindrical part, *a*, and is attached to the top of the young maple, as shown in the sketch. The lower end of the rope is fastened to a piece of wood *c*, which, at its other end, is attached to one of the roots of the trees, and thus serves as a foot-board. After this the man fastens a cross-bar, *d*, to the trees, and begins to turn with his chisel whatever he wants to produce.

It is clear that this lathe has a reciprocating motion, but nevertheless the objects manufactured with this primitive machine are nicely turned, and do not lead to the supposition of so rough a tool.