

MECHANICAL COOPERAGE.

Receptacles destined to contain wine have borne different names, but, though the cooper's art is lost in the night of ages, researches have proved that the primitive form has been preserved. As for the material, that has changed, and wood has only succeeded the pitch-hardened skins that are still used in Spain, Italy, Greece, and Algeria. In antiquity, moulded clay or chalk, dried in the sun and hooped with iron or lead, preceded wood. Diogenes' tub was of baked clay, and Homer sings to us that Jupiter had a tub on each side of him, one of which contained blessings and the other evils. These poetic vessels were indeed of baked clay; but, alas! they were not of equal capacity, since the one containing evils had the greatest bulge. Human nature was already showing a bad disposition.

However it be with poetry, wood finally prevailed. Its native qualities and its abundance in nature designated this elastic and workable material for its noble mission. It is Pliny who tells us of this use of wood, and he attributes the first employment of it to the Alpine Gauls, the Piedmontese of our day.

As long ago as the year 70 A. D., Varro and Columella, in their works on rural economy, spoke of pieces of wood united by hands.

Since that epoch the construction of tuns, or casks, has gone on improving. The manufacture of casks by

descends automatically and tightens them up. This done, the cone rapidly ascends, leaving upon the cask a temporary hoop. After opening the cone, the cask is inverted and the same operation is performed on the other extremity. The cask is thus perfectly assembled, and the joints are absolutely tight.

Thus mounted, the cask is placed in the crozing and chamfering machine (Fig. 3). Here, in a single revolution, the two extremities are shaped in the most accurate manner, and prepared for the reception of the heads.

After the boards that are to form the heads have been planed in the machine mentioned above, a joint is made by means of a small mechanical jointer, whose frame likewise carries a lathe for making the dowels, and two small boring apparatus that form the apertures into which the dowels are to be inserted. After the head pieces have been assembled and cut into a circular form by the band saw, they are placed in the fourth special machine (Fig. 4), which bevels their edges. The last operations—inserting the heads and putting on the hoops—are done by hand.—*From La Nature.*

Some Newly Discovered Virtues of Phosphoric Acid.

Phosphoric acid is not a remedy that has hitherto enjoyed much of a reputation, its employment having

The injection of the solution, in another case, into an enlarged gland of the neck effected a reduction of the swelling and induration within twenty-four hours. Suppuration of the gland followed later, but was limited to a very small part of it.

Perhaps the most striking results were obtained in a case of caries of the wrist. The disease had lasted a year, and the hand was greatly swollen from the carpus to the metacarpo-phalangeal articulations, and there were two sinuses, one on the dorsum and the other in the palm, communicating with each other. Pressure on the hand caused the exit of blood mingled with pus and caseous matter. Exploration with the probe showed a large extent of carious bone and a general undermining of the soft tissues. The hand would ordinarily have been condemned by any one to amputation. Trial was first made of interstitial injections by means of a hypodermic syringe, but little improvement followed; and then recourse was had to daily irrigation, through the sinuses, with the phosphoric acid solution, compresses wet with the same being applied in the interval. Some benefit was observed from this treatment, and it then occurred to the author to immerse the hand in the solution. Two such baths were given daily, each of two hours' duration. At the end of seven weeks the sinuses were closed, the swelling was reduced more than one-half, and there was free motion at both the

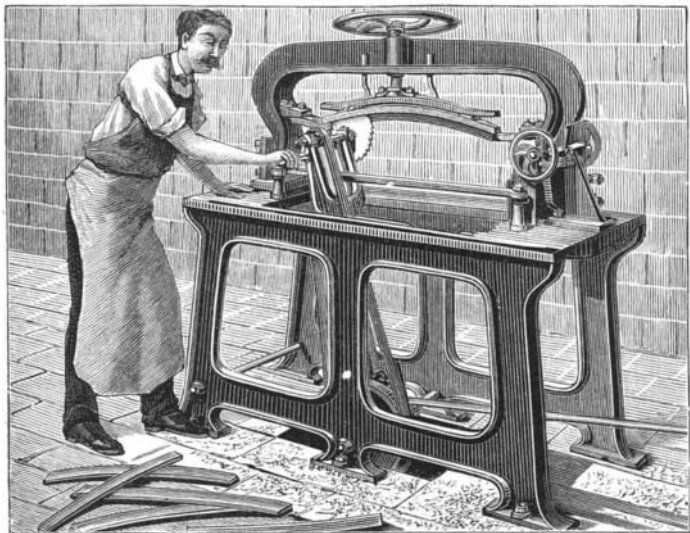


Fig. 1.—MACHINE FOR CURVING AND JOINTING STAVES.



Fig. 2.—MACHINE FOR ASSEMBLING STAVES.

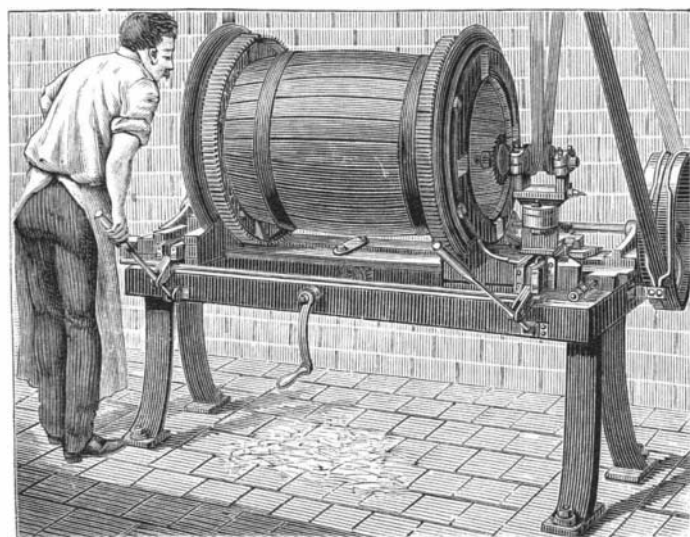


Fig. 3.—CROZING AND CHAMFERING MACHINE.



Fig. 4.—MACHINE FOR TURNING AND CHAMFERING BARREL HEADS.

hand is a very complex operation, and requires great skill. The tools used are the plane, jointer, drawing knife, bench, hoop bender, block, broad ax, bung borer, dowel, notching knife, compasses, and hammer. Each of these tools has a special duty to perform. We shall not dwell upon the details of the various operations, but shall proceed to a description of four machine tools that perform all the work formerly done by hand with the above named implements.

The wood to form the staves is cut to the proper thickness by means of a band saw. These slabs of wood are then put in a planing machine and planed according to the curves of the internal and external surfaces. We do not illustrate the saw and planer, because these apparatus do not belong exclusively to the cooperage industry.

The staves are next put into a machine (Fig. 1) which gives them the proper curve, and trims the edge so that it will form a joint with mathematical precision. This latter operation is performed by a small circular blade, which moves exactly in the plane of the axis of the cask. This blade is toothed, and both saws and planes the surface that is to form a joint. This operation, which by hand is performed by means of a jointer, requires great dexterity. The machine, however, can be run by anybody, and do perfectly accurate work in all cases.

The staves, having been bent and jointed, are next placed in the machine shown in Fig. 2. Here, after being accurately fitted together, a strong iron cone

been chiefly that of a tonic, giving place even in this application to the other mineral acids. But if some recent therapeutical experiments can be accepted, this drug possesses virtues which will serve to place it in the front rank of curative agents.

In the *Gazzetta Medica Italiana* for October 29, 1887, Dr. Antonio Grossich reports a number of cases in which most remarkable results followed the external use of phosphoric acid. He was first led to employ it from a consideration of the results obtained by Kollischer in the treatment of local tuberculosis by interstitial injections of a solution of calcium phosphate. He tried local applications of the same solution in the treatment of ulcers of the leg, and found it to give satisfactory results. But, as there were no tubercles in these cases, the action of the remedy ought to be explained otherwise than by a calcification of the tubercles, and the author concluded that the phosphoric acid must be the active agent. Acting upon this belief, he began to treat all his cases of obstinate ulcer of the leg by local applications of a ten per cent solution of strong phosphoric acid in distilled water, the compresses being renewed three or four times a day. The results obtained were so satisfactory that he was encouraged to try the same substance in various tubercular affections.

In the case of two young girls suffering from multiple ulcers of the neck following tubercular adenitis, the application of a solution of phosphoric acid of the above mentioned strength brought about a cure in five weeks.

carpal and metacarpo-phalangeal articulations. A tubercular abscess of the walls of the chest, treated by free incision and stuffing of the cavity with lint wet with the phosphoric acid solution, was completely and permanently cured in less than four weeks. Finally, in a case of chronic *eczema marginale*, in a girl of 22 years of age, applications of the same solution had, at the time of writing, two weeks later, caused such marked improvement that the author felt confident of effecting a perfect cure within a short time.

Dr. Grossich reported a number of other cases than those to which we have referred, in which he obtained equally good results. He is naturally somewhat enthusiastic in his praise of this remedy in the treatment of local tubercular processes, and he believes that phosphoric acid has a future before it which would never before have been imagined. Lentin, it may be stated, some time ago recommended the use of a ten to twelve per cent solution of phosphoric acid in the treatment of caries, believing that this process was due to a deficient amount of the acid in the osseous tissues. The cases in which he tried these applications were benefited somewhat, but he obtained no such brilliant results as those reported by Grossich.—*Med. Record.*

AT Barre, Vt., is being quarried an immense block of granite to be used in a California bank vault. It is to be twenty-five feet long, five feet thick, and five feet wide, and it will require thirty span of horses to draw it four miles to the railroad station.