

TEMPERED DUCTILE METALS.

BY ARTHUR F. BRESLER.

A process of tempering gold, silver, and copper has been discovered by Mr. Z. F. Vaughn, of Los Angeles, Cal. By his method of tempering, it is claimed that the ductile metals are not only hardened, but their density and homogeneity are brought to such practical perfection that a cutting edge is given keener and more durable than that of steel, because of the microscopic fineness and smoothness imparted to it.

The inventor's experiments were devoted chiefly to the manufacture of surgical instruments of gold, his first production being a hypodermic needle of solid tempered gold. He has added to this all the instruments now in use in modern surgery. Prominent surgeons have given these instruments practical tests and in every case the results, it is said, were entirely satisfactory. For surgical purposes, the inventor claims that instruments of tempered gold are superior to those of steel, because of their non-corrosiveness and the ease with which they may be sterilized. The antitoxin needle is about two inches long and the needle for spinal anæsthesia is about three inches long. There is no clogging; consequently it is not necessary to use wire. The needles are easy of introduction, the largest size passing through the tissue more readily than the smallest steel needle. As the needle is entirely aseptic, it leaves no mark. All wearing surfaces are solid gold and may be either 24 karat or any degree of alloy. The secret of the process appears to be in the solution used in tempering.

The inventor states that tempered copper is not subject to that crystallization through vibration which limits the life of steel; that springs of tempered copper have not only as great elasticity and strength as steel springs, but that owing to the extreme slowness of the process of crystallization, they will retain the spring temper for a practically indefinite period. It is expected that a most extensive use of tempered copper will be made for journal bearings. Owing to the great density of the metal, it takes a perfect polish with use and makes an almost frictionless bearing, free from danger of overheating, and outlasting either Babbitt metal or brass for the purpose.

Under a microscope, a razor manufactured by Mr. Vaughn showed a much smoother edge than a steel razor, and a test proved that it held its edge longer.

WELLMAN'S MOTOR BICYCLE SLED.

Before leaving for Paris to arrange for the construction of his polar airship, Walter Wellman sent a representative to interview the automobile people of the country, select the best and make a contract for the building of a trial motor towing machine. The experience was disheartening. Almost every prominent concern had more orders on hand than could be filled, in which there was an assured profit, and to undertake an experimental machine such as Wellman wanted "would throw the entire factory out of its stride."

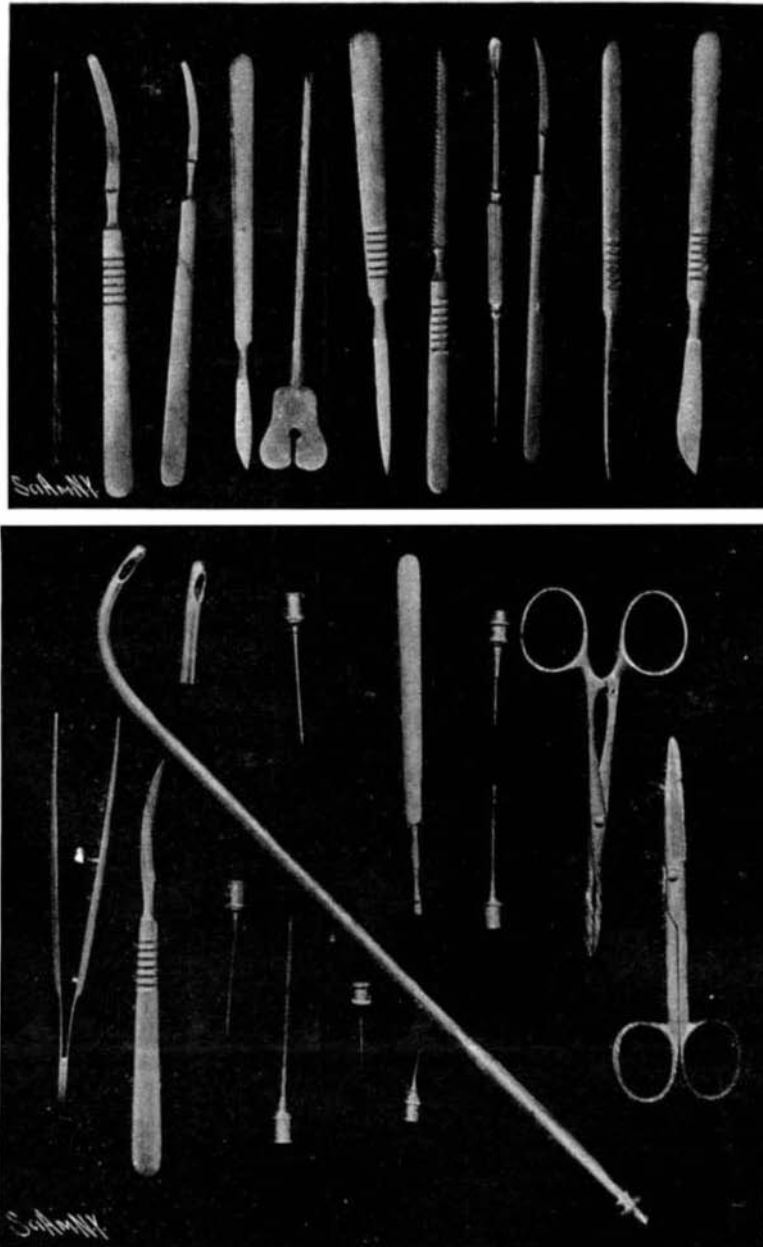
After weeks of vain effort Wellman's representative returned to Washington, enlisted the interest and cooperation of Charles M. Miller & Bro., who detailed George W. Wells, an automobile expert and a man of much originality of thought, to build the machine. In a stable in an alley-way in the northeast part of the city, where the desired secrecy could be had, the work was begun and finished.

The motor and tri-car frame used were secured from a motor bicycle maker, but everything else was constructed by hand under Mr. Wells. The motor is of $4\frac{1}{2}$ horse-power. It is intended for towing solely and not for speed and therefore is geared low. The machine can travel from two to thirty miles an hour over smooth ice.

The runners used are of two pairs of Norwegian "ski," both having seen actual service in the north on Wellman's two former trips and having been worn by Wellman himself. The wood is therefore seasoned and can be relied upon. They are reinforced, however, with sheet-iron, underneath which are steel runners or skates. The front "ski" are the guides; the rear ones being used to take some of the weight from the tractive or driving wheel when soft snow is encountered,

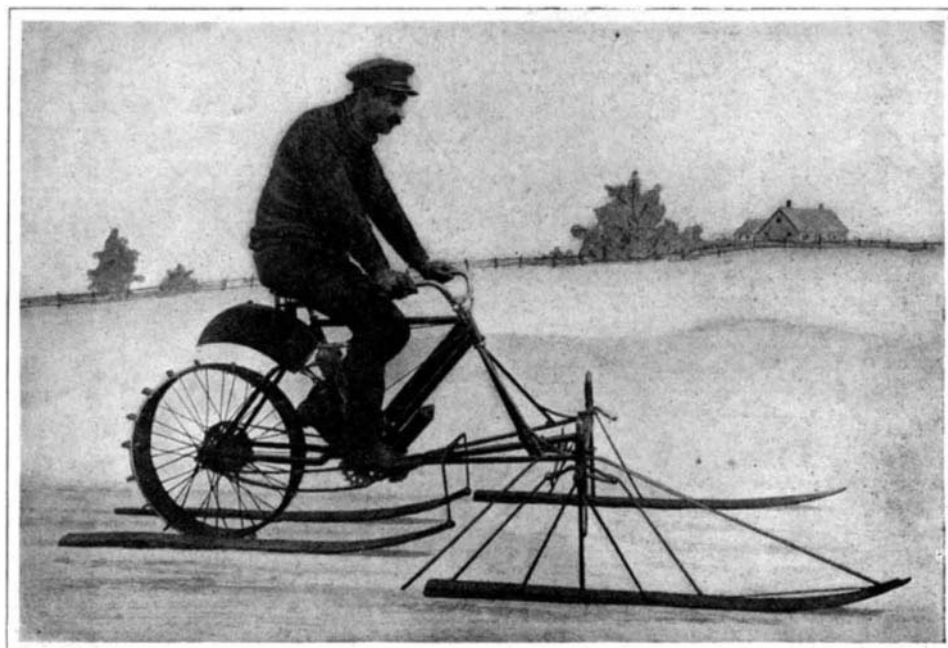
which is frequent enough in the frozen North to make such a provision necessary.

The driving wheel is quite an interesting bit of mechanism, and is Mr. Wells's invention. It is constructed entirely of steel except for the rubber tire. The width of the wheel proper is about six inches, on the outer edge of which are broad teeth that are to give the power in the snow or soft ice. In the center is a pneumatic tire of rubber two inches wide. This is covered with steel wire to prevent puncture, and

**SURGICAL INSTRUMENTS OF TEMPERED GOLD.**

this latter is covered with a strip of leather which is filled with sharp steel teeth about the size of the head of an ordinary screw, that will grip the hardest ice and, as Mr. Wells put it, will climb the side of a house.

The steel chimney of largest diameter in the United States is at the smelting works of the Copper Queen Consolidated Mining Company, at Douglas, Ariz. This is 200 feet in height, 25 feet internal diameter, and 34 feet diameter at the base. The steel chimney of the Compania Minera de Penoles, at Mapimi, Mexico is 300 feet in height, 14 feet internal diameter, and 24 feet in diameter at the base.

**WELLMAN'S MOTOR BICYCLE SLED.****Sociological Effects of the Telephone.**

The "oyster king" of New York city has just been "put out of business" and has lost his monopoly of the trade because of the telephone. The connection between cause and effect, and the bankruptcy of the bivalve monarch is thus explained: Instead of going over to the docks on the Hudson River to buy oysters nowadays, the big hotel and restaurant managers simply ring up the oyster planter on the telephone and order oysters direct, or give the order to the oyster agent, who telegraphs it to the planter. Then the oysters arrive by railroad train. That, they say, puts the oyster barge business "in bad," and forces many of the old-time barge captains to the wall. The telephones have wiped out the middle man or jobber. Consequently many of the old wholesalers have been driven out of business, and instead of twenty or thirty oyster barges lined up along the North River piers, there are now two or three at the foot of Bloomfield Street.

Another sociological or economic effect of the telephone is noted by the Boston Herald as follows: "Even the rural mail carrier is in a measure anticipated by the telephone in many country districts. Now the farmers on the circuit in the Western States, where enterprise is a 'hustler,' and innovations are welcomed instead of being fought, are to receive at least once a day, and perhaps twice, all the important news of the world. The system, it is said, 'is being installed in Minnesota, Iowa, and South Dakota, and within six months will be in vogue wherever telephones are used in the rural districts. Not only this, but every schoolhouse will be connected, and while the service is being transmitted a recess will be had, after which the teacher will impart to her pupils the news of the forenoon. The farmers will have an added advantage, for they will get the news twice a day—at noon and at 7 o'clock in the evening.' At first it was thought this would injure the circulation of newspapers, but the reverse is proving true. The appetite for news grows by what it feeds on, and as the telephone operator can give in a twenty-minute talk only a mere bulletin of the news, the daily or weekly paper with 'the particulars' is eagerly waited for. 'The most notable result of the news service,' says the manager of a rural telephone line, 'is the increase in subscribers, and our merchants note a corresponding increase in telephone orders for goods to be sent by the rural mail carrier, while the farmer's visits to town have become less frequent, and are now seldom made when he is not going to market with his produce.'—Electrical World.

The big trainshed seems to be a thing of the past. The initial cost of these gigantic structures, and that of maintenance, grew out of all proportion to the increase in the dimensions, and the present practice seems to indicate that the last of them has been seen. Besides their actual utility, the great train span was considered to have some advertising value, and it was no common thing to see announcements made that this or that railroad was to have the greatest trainshed in the world, but the limit of their usefulness has been reached. The cost of keeping these sheds in repair grew to be a very serious item, and another drawback charged against them was their inadaptability to enlargement as it was found necessary to increase the number of tracks. What is known as the "umbrella shed" is taking its place. The umbrella system consists of a number of smaller sheds, each protecting the passageway between two trains. They are supported in the center, which explains their name. The roof is flared upward at the edges, so that the rain will be drained toward the center, where accommodation is made for it to be carried off through the supporting pillar. A great portion of the shed roof consists of wire-glass to admit the light. Besides the economies of this new method, its possibilities of expansion in either direction are almost unlimited. It can be readily made longer as desired at any time, and as new tracks are added to the terminal facilities, it is simply necessary to add a shed or two. This has been adopted by the Lackawanna Railroad Company for use at Hoboken, N. J., and will also be made use of in the future by one or two western roads.