

PRESS FOR MAKING STEEL BICYCLE RIMS.

One of the most recent examples of the ingenuity of the modern bicycle maker is the production of a jointless felly, or rim, for wheels. The importance of the cycle industry at the present day is well illustrated by the fact that quite a large factory has been established for the production of these jointless rims.

The advantages of the jointless rim are a nearer approach to uniformity in size; a more equal tension of the metal; and, by avoiding the heat of brazing, the metal is not softened.

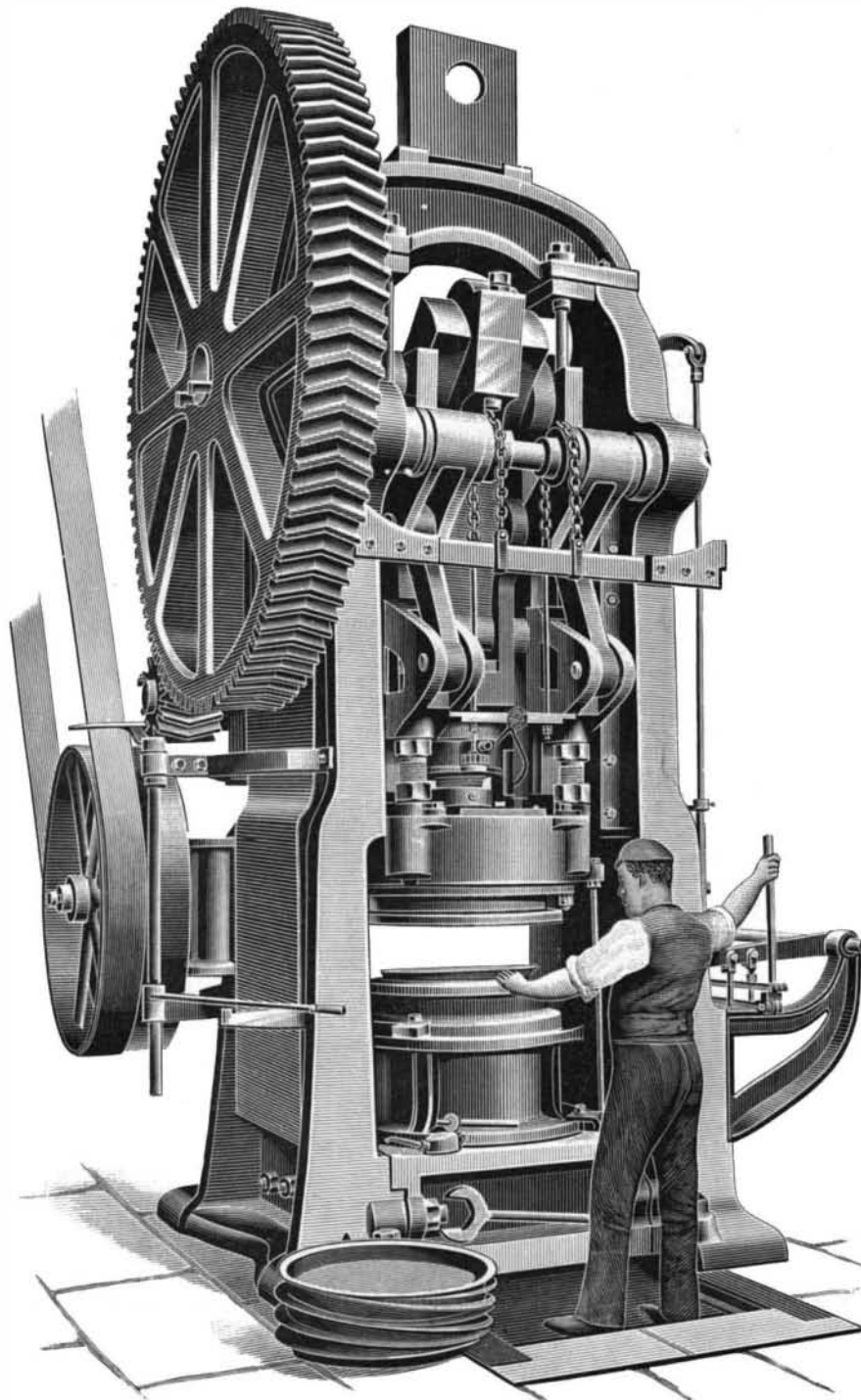
The steel sheets from which the rims are made come in from the rolling mills in the form of squares. The steel is of a kind made specially for the work, the composition having been decided by Mr. C. H. Pugh, the designer of the machinery about to be described, after a long series of chemical and physical tests. It is, of course, the product of the Siemens furnace, and must necessarily be of a very excellent quality, otherwise it would not stand the treatment to which it is subjected. To judge by its working, we should suppose it to be a steel made from hematite ore in a basic lined furnace, but on this point we have no information.

The square sheets are taken through a circle cutting machine and the corners sheared off. There is formed in this way a blank, consisting of a flat circular sheet of metal, and this is taken to a big power press, which we illustrate. These presses have been designed specially for the work, and supplied by Messrs. Taylor & Challen, of Birmingham. They are placed three in a row. They are powerful machines, each weighing about 35 tons, and are capable of admitting a blank 44 inches in diameter, which they will draw down to a pan-shaped piece 22 inches in diameter and 11 inches deep, if required.

In these presses the circular sheets are pressed into the form of a shallow dish with a turned-over rim. In the view of the press a number of the blanks that have just been stamped are shown. In working the press the blank is placed on a flat ring of metal or die. The outer slide then comes down and holds the blank round its circumference. In this way a ring of metal is between the annular tools, it being held tightly enough to prevent the steel from buckling when dished, and yet not so tightly as to prevent it flowing between the tools when the stamp comes down. It will be easily understood, under these circumstances, that the press has to be very carefully made. The steel blank being held in this way, the inner slide descends, and the circular sheet is pressed into the dished form. It will be seen that, so far, the practice followed in the preparation of hollow ware is here adapted to the manufacture of bicycle wheels.

The next process is to cut out the center of the blank, by which operation it is converted from its dish or plate like form to that of a circle, and begins to have some sort of resemblance to a wheel rim. The cutting out of the center is done in a lathe having a pair of revolving shears mounted on a slide rest. The inside cutter is brought up until it just touches the work, and the cutter on the other side is then pressed home by a lever. The partly formed rim is then brought to the requisite section by a number of spinning processes.

Hollow fellies are composed of two separate rings, which are ultimately soldered together. These are known as the block and tread, each of which is prepared in the same general manner, for each has to be brought to a shallow U-section, though the block or inner ring is a deeper U than the tread, or outer ring, against which the India rubber tire abuts. The block, it will be understood, is that part which



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is drilled to take the spokes. We are now describing roughly an ordinary form of rim for pneumatic tire. There are many special forms required for varying descriptions of tires, but the same principle of construction governs all. When the central part of the dish-shaped blank was cut out, as described, a ring somewhat of Z-section was left, or more correctly speaking, the corner of one angle having been previously rounded off. By means of the various spinning lathes, one angle is gradually turned over, and, during successive operations, the corners are rounded off to form the U. The chief point of interest about these lathes is the method of chucking. In one series of operations a large split chuck is used, the work being held by its inner flange between two disks. The spinning tool is

or, in other words, the space between the two rings, which gives the hollow felly, is crescent-shaped in section.

It now only remains to solder the two parts together in order to make the turned-over joint firm. This is done in the same manner as the tinning operation, before described.

The test for breaking is equal to the strain that would arise if the rim were placed horizontally, supported only at two opposite points of its circumference, and a 14-stone man were to stand on it, each foot being midway between the points of support. After being subjected to such a test, the rim is tried in a lathe to see if it has received any permanent set.

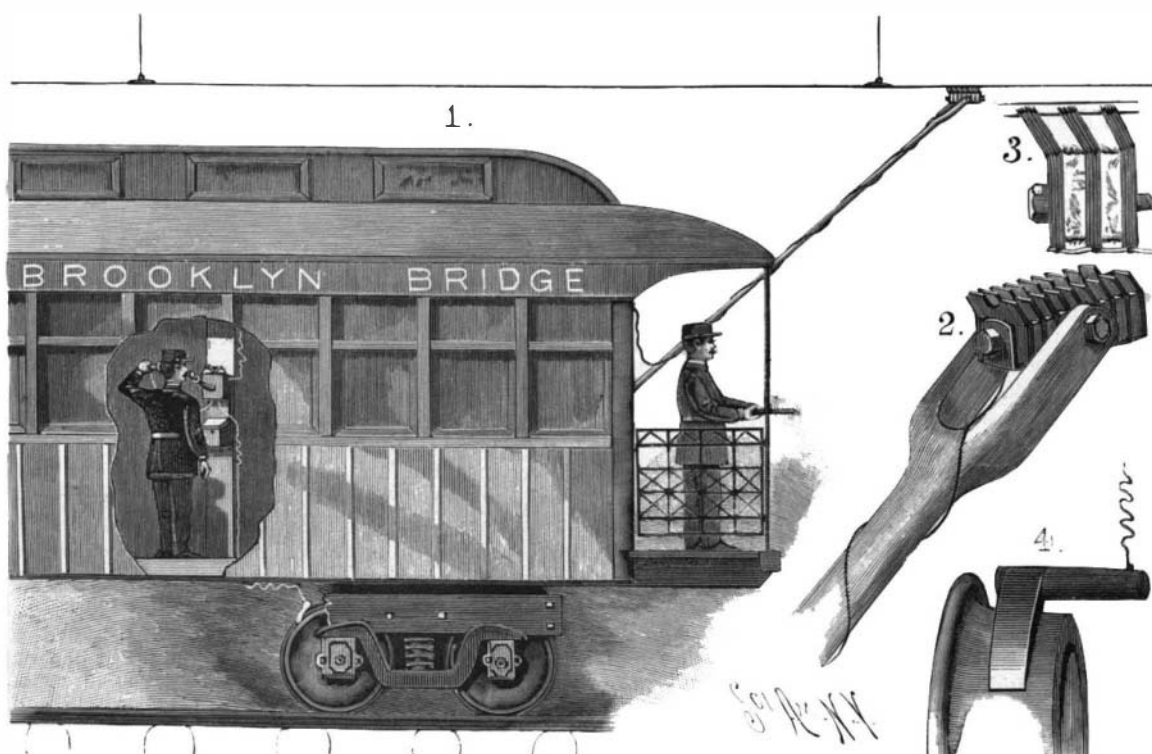
We are indebted to Engineering for our illustration and the above particulars.

TRAIN TELEPHONY.

Some interesting experiments have recently been tried by Mr. Kingsley L. Martin, assistant engineer on the New York and Brooklyn Bridge, in the line of establishing telephonic communication between moving trains and between trains and the train dispatcher's and bridge offices.

The necessity of some adequate method of train communication and signaling in cases of fog or some emergency has been felt, but there have been difficulties in the way of establishing telephonic communication with moving trains that have prevented it from being put into practice.

Mr. Martin has overcome these difficulties and has succeeded in communicat-



TELEPHONING FROM MOVING CARS.