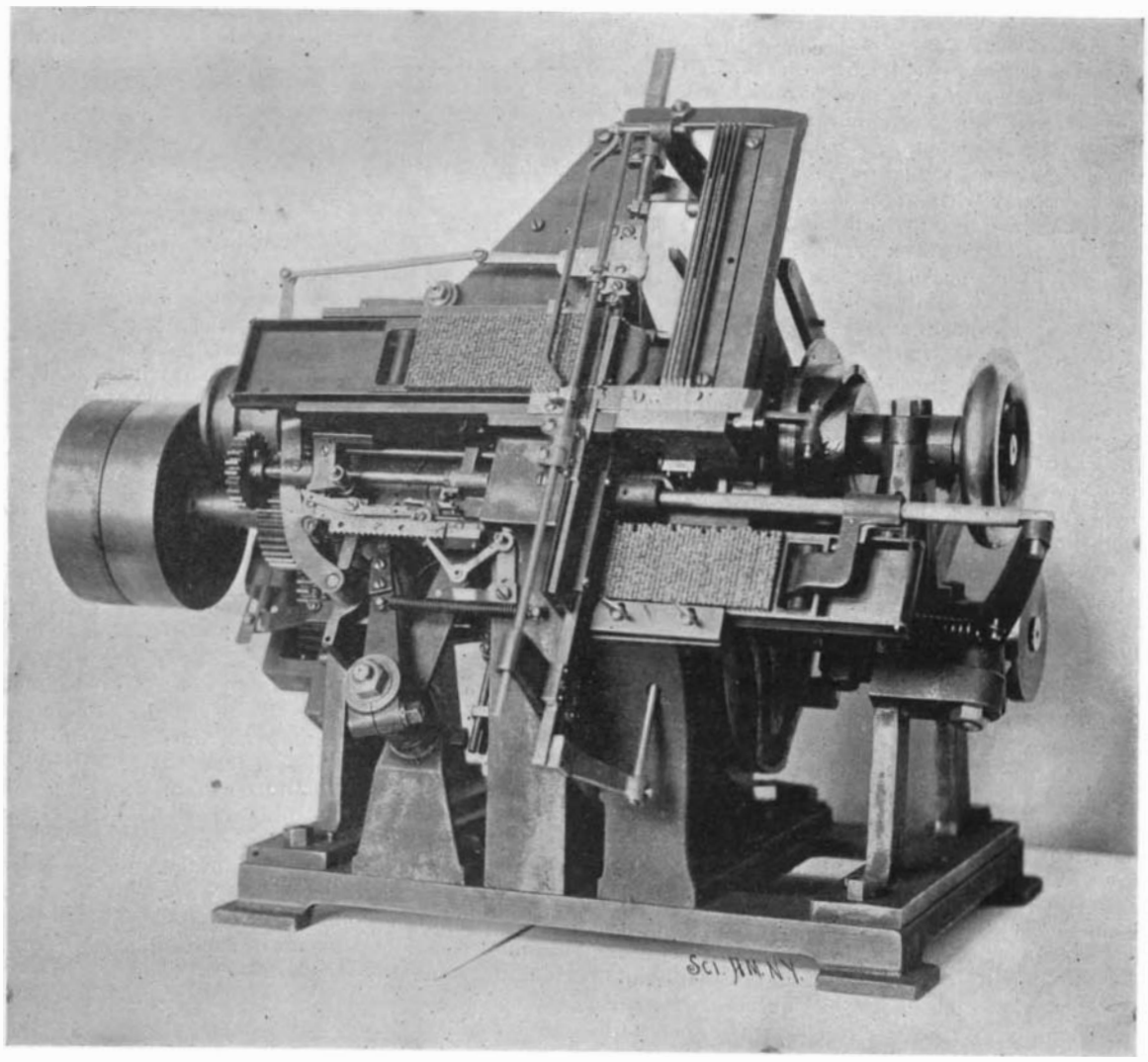
A PRINTERS' TYPE JUSTIFYING MACHINE.

The highly ingenious machine shown in the accompanying illustration automatically lifts lines of type from a galley and justifies them, the exactly spaced lines being deposited on a second galley, and the machine doing its work without any assistance whatever, beyond the putting on and taking off of the galleys containing the columns of matter. The machine is a recent invention of B. M. Des Jardins, of Hartford, Conn. The matter as presented to the machine is assumed to have been corrected and revised, and as it is well known that in the most careful book composition there are many corrections and revisions and rerevisions, for each of which there is the additional labor of justification, it is expected that this machine will find a practical field in such work, as well as in the justification of matter from type-setting machines which set up the type in a continuous line, requiring a special hand to do the work of spacing. In the type set up for this justifying machine the words are separated by strips of brass, which aid the machine in locating the positions of the spaces, and the lines are held apart by thin rules to protect the loose, uneven ends. A reciprocating ratchet rod operating a traveling block automatically feeds the column leftward, a line at a time, into the justifying mechanism, which is located in the middle of the machine. The first line is then lifted under a clamping bar which supports the dividend member of a mechanical computing instrument and at the same time the separating rule is removed. This dividend member acts in conjunction with a bar which records the number of places requiring spaces, and the combined position of the two determines which sizes are wanted. This division gives the first step toward the full result sought for. Three sizes of spaces are employed, which are respectively eighteen, twenty-four, and thirty one-thousandths of an inch in thickness. These are combined to make other sizes, all of which differ from each other by the same amount. Whenever the instrument's division gives a result between any of the regular sizes, it indicates the nearest smaller one and records the remainder in such a way as to cause the machine, at the required time, to shift the action to the next larger space, thereby indicating a proper combination of two sizes. The setting of the computing instrument just described occupies only the fraction of a second of time, and that is followed by another motion of the line upward, into a channel which leads directly to the receiving galley. The line is then pushed along this channel intermittently, being intercepted by the brass strips opposite the space collecting and transferring device. The latter is located below the end of the reservoir channels, and is controlled by the computing instrument. It is made to collect out of one or more of the three channels such spaces as are needed to build up the required thicknesses; and the instrument also causes the space collector to change sizes in time to use enough of the larger ones to fill out the line correctly. The transferring device also removes the original brass spaces from between the words, and inserts the new ones in their places. Upon the disposal of the last word, another action of the computing instrument starts the discharging mechanism, and the channel which now contains the line is caused to collapse and deposit its charge on the receiving galley, to the left, accurately justified.

In properly proportioning his spaces, the printer calculates by the eye, as best he can, the spaces required between the words of a line, and the greater the accuracy required the more time will be consumed in justification, but this machine secures absolute, mathematical accuracy, such as is demanded in the best work, and leaves no room for carelessness or bad judgment.



THE DES JARDINS TYPE JUSTIFYING MACHINE.

THE KENSINGTON BICYCLE.

The modern bicycle has been brought to such a state of perfection as a piece of machinery that any improvements in it at the present day are of greater interest than ever before, as indicating a still further approach to what may be not rashly termed mechanical perfection. In the cut we present illustrations of some of the features of the Kensington bicycle, which certainly show a most interesting development in the art of cycle building.

Referring to Fig. 1, which gives a section of the crank bracket, we find it shown with a cylindrical body into whose ends are screwed the ball races. The balls are retained in these by retainers shown in section. The sprocket wheel spider is brazed upon the crank shaft and is turned with a recess so as to extend over the edge of the cylinder. Directly against the spider is butted the right hand cone. This makes the sprocket side practically dustproof. The other side of the bracket is treated in much the same way, except that here the adjusting cone is threaded on the axle and is provided with lock nuts and washers, while outside of all is a dust cap also lapping over the bracket, thus securing the dustproof feature for this side also.

The oiling tubes of the crank bracket are a peculiarly happy device, being so arranged that the oil reaches the balls—something one can rarely be sure of in the ordinary type of crank bracket. It should also be mentioned that the cranks and shaft are all in one piece and that the sprocket is secured by four bolts to the spider, the spider being screwed on to the shaft and brazed.

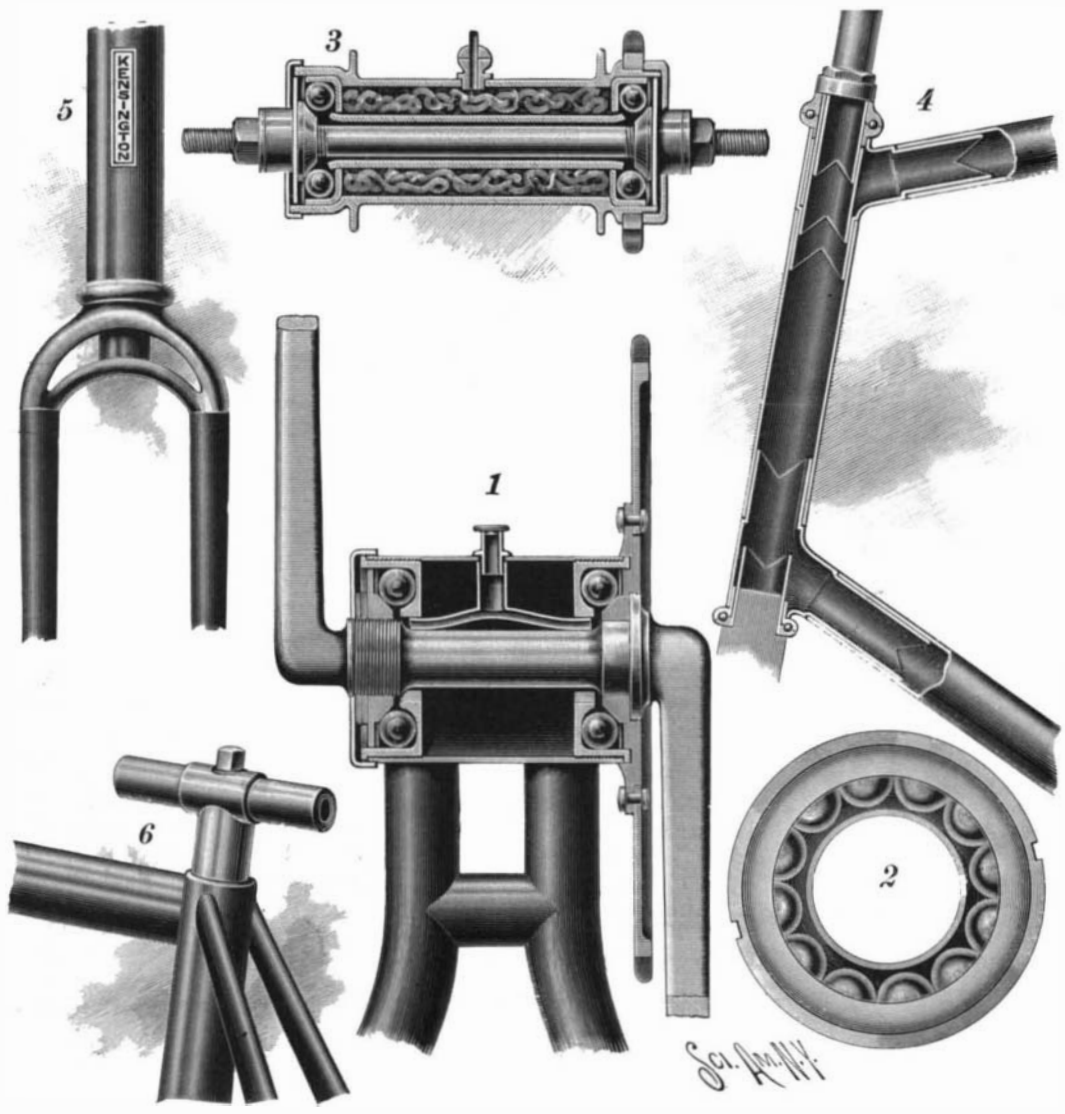
The cranks are square in section, it being considered that both their strength and appearance are improved by the adoption of this section.

As an example of a ball race, Fig. 2 is given, showing a front view of the ball retainers.

In Fig. 3 the hub of the driving wheel is shown. Here will be seen the same dustproof construction carried out on the lines explained with reference to the crank bracket. The interior of the hub is packed with waste or lamp wick and communicates by small openings with the ball races. A single oiling answers for the whole season.

What the manufacturers term their flush joint connection forms a very interesting and valuable feature, and is illustrated in some detail in Fig. 4. By studying the illustration it will be observed that where the connections enter the tubing they are recessed, so that the tubing telescopes over the diminished portion and butts against the shoulder. This gives a perfectly flush joint, and after brazing, a most secure one. It will be observed how this principle is carried out in the different joints of the head as shown in Fig. 4, and this head may be accepted as an exponent of the system as applied to all other parts of the frame.

In Fig. 5 is shown the very characteristic fork crown, on which there has been granted a patent. This is an



NOVEL DETAILS OF THE KENSINGTON BICYCLE.