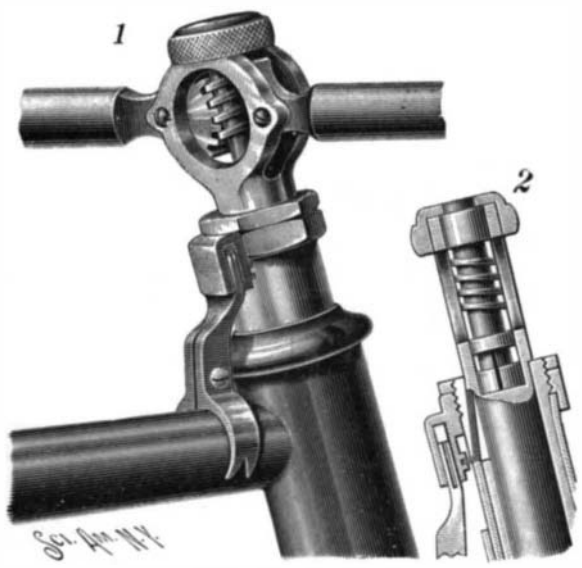
A NEW BICYCLE HANDLE-BAR.

A novel manner of mounting bicycle handle-bars has been devised by Mr. Tacitus W. Gaillard, 346 South Fifth Street, Brooklyn, New York city, the special objects of the invention being to facilitate easy adjustment and to render the mountings of the bars secure. To the upper end of the fork-stem a tubular plug socket is fastened, upon the enlarged upper end of which a nut is screwed. The nut serves to clamp the fork-stem and the enlarged portion of the socket rigidly together. From the rear portion of the nut two parallel spring-fingers project downwardly, which are designed to receive a spring portion formed on the bifurcated upward extension of a clamp embracing the upper horizontal bar of the bicycle-frame. When the spring-fingers hold the extension of the clamp, the fork-stem is held steadily and prevented from moving except upon the application of positive pressure.

In the socket of the fork-stem is a plug which carries the handle-bars. The plug is provided with a spring-catch extending through a slot in the socket and through a corresponding slot in the fork-stem so as to engage a stud on the inner spring-finger. Thus the plug is removably held in place. By withdrawing the plug the removal of the handle-bars is facilitated.

The upper end of the plug has two ring-like extensions, between which are mounted the inner ends of the handle-bars, which ends are in the form of toothed segments. Meshing with these segments is a worm, the lower end of which is split, and the parts sprung out to form spring-fingers, which are held friction-tight in a cavity in the plug. The worm at its upper end is provided with a cap, which, when turned, rotates the worm and adjusts the handle-bars. No tool is required. The bars may be adjusted even when the rider is on the wheel.



THE GAILLARD HANDLE-BAR.

HANDLING ANTHRACITE COAL.

BY WALDON FAWCETT.

The story of the development of the anthracite coal field of Pennsylvania has always been full of attraction for students of commercial and industrial progress, both here and abroad, and its interest has been deepened as time has gone on and the apparent inexhaustibility of certain of the deposits has been demonstrated. There has been slight recognition, however, of how really an important a part in the evolution of the anthracite coal trade has been played by the improvement of facilities for the handling and movement of the fuel at every stage of its transit from mine to consumer. Nevertheless, in few industries has the value of the market been so entirely dependent upon an ability to place the commodity within reach of consumers. Finally, the many unique features of the system followed, notably the extent to which the railroads have controlled the mines and the operations of the pool which apportions the quantity of coal to be carried by each road, make the transportation of anthracite the most distinctive phase of the trade.

At the present time there is not a link in the entire transportation chain which connects the mine and the consumer wherein the most advanced and economical methods are not in force. The use of electricity about mines for lighting and other purposes has resulted in the development of electric locomotives for haulage purposes, and the coal is now drawn to the surface by electric engines of from two to fifteen tons weight. These locomotives have from one to three motors, ranging from ten to thirty-five horse power, and each is capable of pulling quite a train of the small cars in use in mines, at a speed ranging from six to ten miles per hour. Even the mine cars have undergone wonderful improvement during the past few years. Steel is largely employed in their construction and improved devices for quick dumping are fitted.

The coal is transported from the mines in the new type of pressed steel car, which is of about 50 tons capacity, and from 20 to 25 of these cars make up a train. In service on the coal-carrying roads are some of the largest and most powerful locomotives ever constructed. Some of these engines weigh close to 125 tons without the tender, and have a wheel base in excess of 24 feet. Locomotives of the type mentioned have a tank capacity of more than 7,000 gallons of water and a coal capacity of some 14 tons.

The railroads which enter the anthracite region are all operated under an agreement as to the basis on which the shipments of coal are to be divided between the various lines. The Philadelphia & Reading Railroad, for instance, which controls nearly a third of all the mining territory, is privileged to carry one-fifth of the aggregate output of the anthracite field. Another road is apportioned fifteen per cent of the total; several lines are entitled to one-tenth of the aggregate, and so on down to the lesser carrying lines, four or five of which only receive three or four per cent each of the whole yield.

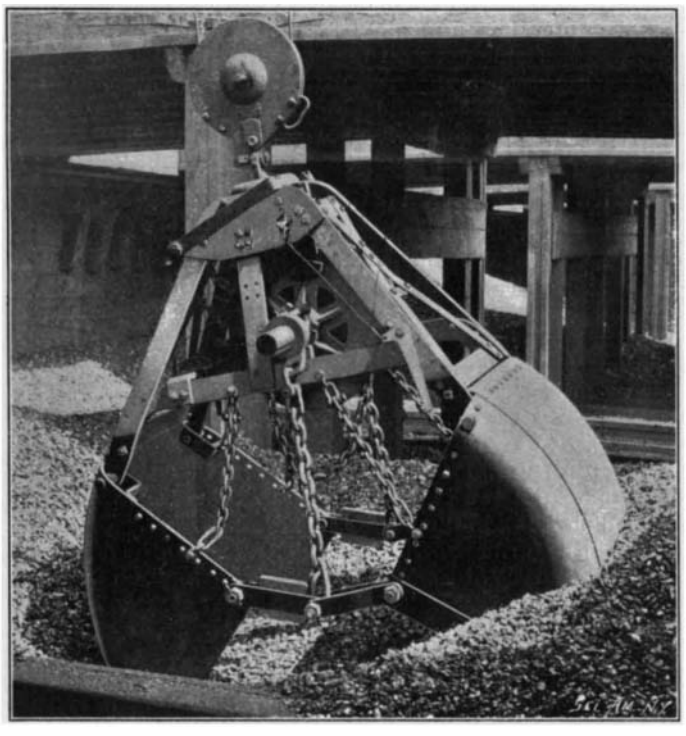
The great bulk of the anthracite mined in the Pennsylvania district is shipped either to New York or Philadelphia, or else northwestward to Buffalo. These three cities are centers of the chief areas of consumption, and consequently serve as distributing points. A considerable portion of the coal consigned to Philadelphia or New York is reshipped, either by rail or coasting vessels, to Boston and other points in New England. Some coal goes south by the same means of transit, but it is a comparatively small proportion of the whole. The port of Buffalo, at the lower end of the Great Lakes, is the gateway through which passes the principal portion of the coal destined for western consumption. From Buffalo heavy shipments are made by lake vessels to Chicago, Milwaukee, Duluth, and other points, and there is also a very considerable traffic by rail.

The receipts of anthracite coal at Boston are somewhat in excess of those of bituminous, and both fuels reach the New England metropolis almost exclusively by water. As an illustration of the preference manifested by the coal shippers for the water route, it may be stated that every year during the past decade in the neighborhood of 2,000.000 tons of anthracite have been received at Boston by water, whereas in no year of which there is a record have the rail shipments exceeded 32,000 tons. The coastwise coal-carrying trade is carried on principally in wooden barges of from 800 to 1,500 tons burden. The construction of craft especially designed for this service has been carried on most actively during the past few years, and last year upward of half a hundred coal-carrying barges were turned out at the shipyards on the Maine and Massachusetts coasts. These barges, most of which are from 200 to 250 feet in length, are towed by powerful towing steamers. One of the best fleets of tugs in this service consists of six vessels, each 140 feet in length and fitted with triple-expansion engines, capable of driving the boat at a speed of 14 miles per hour. There are also numerous four and five-masted wooden schooners in the coastwise coal trade, and within the past few months a six-master had gone into commission. These vessels, all exceeding 300 feet in length, cost in the neighborhood of $100,000 each, spread 10,000 feet of canvas, and will carry 4,000 or 5,000 tons of coal on a draught of 23 feet.

Keeping pace with the other lines of development in the handling of anthracite is the improvement of the pier from which the coal is transferred to ocean vessels. As representative of modern facilities in this line there might be cited the largest of the coal piers of the Reading Railroad at Port Richmond, near Philadelphia. This structure which is probably the largest coal pier of the kind in the world, is 770 feet in length, 61 feet wide and 44 feet high above mean mud tide. The docks on either side have been dredged to a depth of 26 feet at mean low water, so that any craft may be accommodated. The pier is provided with four tracks and has four berths, two of which are provided with six chutes, each thus enabling four 1,500-ton barges or other craft to be loaded simultaneously. The approach to the piers, an earth-fill, is 1,150 feet in length, and the railroad cars, after being emptied, are run by gravity from the pier to the tracks on which the empty cars are stored. This pier, when taken in conjunction with the other facilities at the port, enables the Reading Company to ship fully 21,000 tons of anthracite coal in 24 hours.

In the loading and unloading of coal to and from vessels, and the rehandling of the fuel under various conditions, there are employed some of the most ingenious types of machinery known to the mechanical world. The primary form of apparatus for transferring the coal either to or from a vessel is what is known as the bridge tramway plant, consisting of long bridges with girders of steel or iron, mounted side by side on suitable rails so that they can be readily moved from place to place. Each machine operates over one hatch of a vessel, and is provided at its front end with a hinged apron of suitable length for extending the trolley tracks of the machine over the vessel.

The hoisting and conveying apparatus, known as the "trolley," runs along a track suspended from the bridge from the end over the vessel to the opposite end over the railroad cars or stock pile. For handling the anthracite there is used a self-filling and automatic dumping grab-bucket which will handle three-fourths of a ship's cargo without hand-shoveling. For shoveling the coal from stock piles to cars or boats there is employed an automatic shovel-bucket which requires no hand-shoveling whatever. One of these novel coal-carrying buckets will usually make a round trip from the hold of a vessel to the extreme end of



CLAM-SHELL DREDGE UNLOADING COAL FROM BARGE.

TYPICAL DOCK FOR LOADING COAL VESSELS.