Correspondence.

To the Editor of the Scientific American:

In a recent discussion against the existence of a "Gulf Stream," the statement was made as an argument that steamships from England to New York, practically against the current, made as good time as from New York to England. Is such the case, and if so, what reason can be advanced for the fact?

"GULF STREAM."

[By a glance upon a chart of the movements of the Gulf Stream and other ocean currents, it will be seen that the paths of the ocean steamers are only partially with or against the Gulf Stream in their trips east or west. The northern limit of the Gulf Stream swings over a space of 4 to 5 degrees off the coast of Newfoundland and proportionately along the eastern coast of the United States, pivoting upon the narrow channel between Florida and the Bahamas.

The Greenland current sets to the south and west, between the coast and the edge of the Gulf Stream, while the Gulf Stream sets to the northeast between Newfoundland and the west coast of England.

When the east or west passage is made in the spring or summer months, the currents encountered are about equally divided—the eastern half of the trip being in a current setting northeast to north-northeast, and the western half in a current setting from south to southwest. The northern drift of the Gulf Stream during the latter half of the year will probably show a difference in favor of the eastern trip by the continuous set of the current to the eastward, owing to the northern position of the Gulf Stream. Thus the equal east and west trips of steamers the past season cannot be an argument against the existence of the Gulf Stream; its existence is well established by a thorough investigation of its phenomena and rate of motion during the past hundred years. It was a philosophical question in Dr. Franklin's time.—ED.]

Jet Propulsion.

To the Editor of the Scientific American:

I promised some time ago to give you my ideas on hydraulic propulsion, and as I am fully protected have no hesitation in doing so. It appears from the correspondence you have published on the subject, because the screw is worked on the stern of a vessel (the only available place for it), the jet should be there also.

I place the discharge on the bottom, a little aft of midships, where the resistance will be found the strongest. To add to the resistance, the projection of discharge pipe below the hull (not round in shape) has a tendency, and, in fact, would form an eddy, if the discharge would permit; but to still further increase the resistance, I use four double-acting pumps, two on each side. One has a vertical, the other a horizontal discharge, one opening immediately over the other, at a right angle. The two discharges, coming in contact, will form a curve line, causing the vertical to aid in the propulsion, at all events forming a strong backing. By placing the pumps below the draught line, I get the pressure of the water to help them in filling quick. Another advantage in this arrangement: the friction is reduced to a very small figure. Again, vessels have to be driven astern as well as ahead—a point none of your correspondents seem to touch on. To effect this, I throw the discharge of both pumps through the same pipe, running forward; this would partake somewhat of the form of a jet, although on an extensive scale, and as the body in motion is meeting the resistance, it ought to check the headway very quickly. The pumps should have valve area to correspond with the opening of discharge. A large volume of water discharged at a high velocity is my theory; the larger the body, the larger the resistance. There should be no trouble in getting fifty strokes a minute, making two hundred for the four; however, this would have to be governed by the stroke. In maneuvering, the advantage over the screw system is very apparent; by reversing one set of pumps, the others working ahead, a vessel should turn in very small bounds. In case of an accident to one set of pumps, the other set can be used, and if all should get disabled, there is no screw to drag through the water. This is a brief outline of my plan, which no doubt can be improved on. To enter into all the details would take up too much space in your valuable paper.

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Manual Power Stern Wheel Vessels.

The Commissioner of Chinese Customs at Lappa, near Macao, in his last report mentions a change in the method of navigating the waterways of the Canton province. Only a few years ago the first junk propelled by a stern wheel, worked on the treadmill or Chinese chain pump system, made its appearance at Canton. Experiments were then made to test the relative economy both in time and working expenses of such a vessel compared with one propelled in the usual way by sail. The superiority of the former in both respects having been clearly demonstrated, the stern wheel has come gradually to be fitted to most of the regular trading junks plying on the inland waterways, and these boats are now met with everywhere in the province.

THE STANDARD GAUGE FOR THE M. C. B. COUPLER.

The announcement of the executive committee in relation to gauges and limits for the standard M. C. B. automatic coupler is as follows:

The committee has carefully reconsidered the whole question since the discussion on its report to the convention in June, and in view of this discussion and the action of the convention upon its report, the committee believes that it is the desire of the association to have it act under the instructions of the convention of 1890, and to make arrangements whereby all parties interested may be able to procure sets of gauges, so that all sets will be alike, which can be used to determine whether any and all new couplers of this type are near enough to the standard contour established by the association to insure proper coupling with one another, in so far as it can be insured by close adherence to the standard contour, and also to establish limits of variation for such of the standard rectilinear measurements of the coupler, only, as will promote

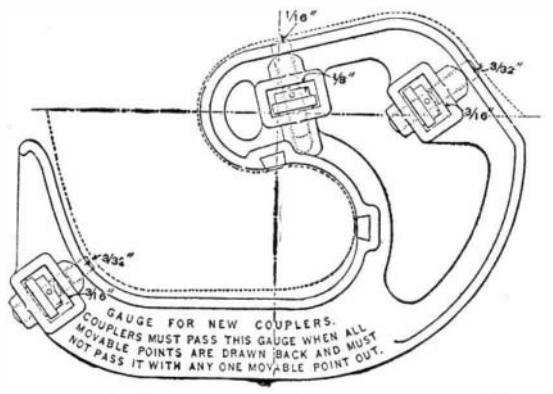

Fig. 1.—DOTTED LINE IS STANDARD GAUGE.

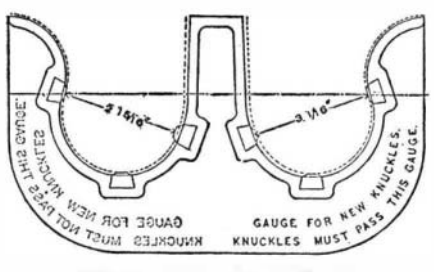

Fig. 2.—COUPLER GAUGES.

the interchangeability of couplers in place upon cars. The committee therefore announces the gauges shown in Figs. 1 and 2 for the contour line and thickness of knuckle, respectively, with the limits of variation allowed by these gauges, and it also announces the limits for the standard rectilinear measurements, as given in the table with Fig. 3.

The gauge for new couplers shown in Fig. 1 is announced in lieu of the gauge proposed in the committee's report to the association, because it provides means for gauging the contour lines, excepting the thickness of the knuckle, at points throughout the whole essential extent of the standard form of contour, and it controls the variation in both directions from the standard, whereas the gauge proposed in the report was only a minimum gauge for a portion of the standard contour, and its use would involve numerous measurements at different heights for the maximum variation, instead of gauging for both limits. The figures shown for the variation allowed with this gauge on Fig. 1 are the same as those recommended in the report at the same points, and the additional point in the back of the knuckle is allowed to vary the same as was recommended at the guard arm.

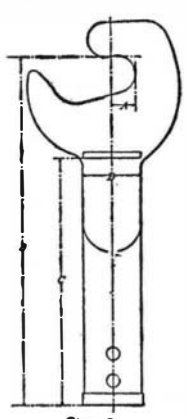

Fig. 3.

	Std.	Max.	Min.
A	2 in.	2 1/16 in.	1 15/16 in.
B	30 "	30 1/16 "	29 15/16 "
C	21 3/4 "	21 13/16 "	21 11/16 "
D	5 in. sq.	5 1/16 "	4 15/16 "

The gauge for new knuckles, shown in Fig. 2, is announced as a proper gauge for knuckles, allowing one-sixteenth inch variation each way from the standard dimensions of 3 inches, instead of one-sixteenth inch one way only, as recommended in the report, because it is thought desirable to allow more than one-sixteenth inch variation on account partly of the necessary taper in cast knuckles.

The limits shown in table with Fig. 3 are announced as proper limits of variation for the standard rectilinear measurements, which are the same as the limits recommended in the report, except that the standard distance, A, of 2 inches, is included herein with an allowable variation of one-sixteenth inch each way and the cross section, D, is allowed to vary one-sixteenth inch each way from the standard measurement of 5 inches instead of only eleven-sixteenths inch one way as recommended in the report. The executive committee considers it inexpedient to announce limits of variation for dimensions which are not standard, but which were mentioned in the report, because the convention ordered that a committee be appointed to report next June on any new standard measurements and limits which may be desirable in connection with the coupler. It is also considered undesirable to provide any specific measuring instrument for the limits of rectilinear measurement given in table with Fig. 3, as these distances may be measured in numerous ways by whatever means are best available.

The executive committee has made arrangements with the Pratt & Whitney Co., of Hartford, Conn., to furnish gauges as shown in Figs. 1 and 2, so that every set furnished will be like every other set and proved by master gauges provided and held by the Pratt & Whitney Company for that purpose, a duplicate set of which master gauges will be filed in the office of the secretary of the association for use in settling any questions in dispute about the accuracy of gauges. The frames of the gauges will be made of the best quality of gray iron, with plain lettering, as shown on the cuts, and the gauging points will be of hardened tool steel.

Water Gas.

When steam is passed through incandescent carbonaceous fuel maintained at 550° to 750° Cent., a gas is produced which consists mainly of hydrogen and carbonic acid, with only small quantities of carbonic oxide. When the fuel is maintained at a higher temperature, the proportion of carbonic oxide increases until, at a temperature of 1,000°, the resulting gas consists of a mixture of about 40 per cent of carbonic oxide and 50 per cent of hydrogen, with only about 5 per cent of carbonic acid. This is known as water gas, and its use is often objected to on account of the poisonous properties of the carbonic oxide contained. The main object of an improvement introduced by Messrs. J. C. Reissig and J. Landin is to produce a gas containing but little carbonic oxide, and to increase its calorific power by removing the carbonic acid from the combustible gases. The process consists in passing steam (preferably superheated) or water through fuel contained in externally heated retorts, or in water gas generators, maintained at 555° to 750° Cent. The resulting gas, consisting of hydrogen and carbonic acid, in the proportion of 2 to 1, is cooled and freed from sulphur impurities in the usual way. It is then passed through an absorbing apparatus containing carbonates of alkali or alkaline earths, preferably solutions of sodium carbonate (soda) or potassium carbonate (potash). These substances readily absorb (especially under pressure) the carbonic acid, forming bicarbonates, from which the carbonic acid is easily removed by the action of a moderate vacuum, especially if aided by heat. The remaining gas consists principally of hydrogen, and ready for use, while the solutions are again available for unlimited repetition of the absorbing operations, etc.

Hints for Merchants Trading with China.

At the recent Congress of Orientalists, Professor Schegel delivered an address conveying some useful hints on European commerce with Eastern countries, and gave some examples of the mistakes made by merchants in sending out goods to China and Java. One instance he gave was the following:

The Chinese are in the habit of boiling their rice in flat iron boilers. These are very thin, and they burn through very quickly. Some English firms thought it would be a very good thing to make these boilers in England and send them to China. Accordingly a shipload was sent to Hong Kong, and were cheaper and stronger than the native boilers; but after a few hundred had been sold, the Chinese would buy no more. They refused to give any reason to the merchants, but the professor asked some of them, and they said to him, "Their boilers are much too expensive." He said, "Oh, but they are cheaper." They said, "Oh, yes, but to boil them we have to use so much fuel. They are too thick, and before we can get our rice boiled we have to spend more in the way of fuel than it would cost to renew our boilers every few months." Another merchant sent out some magnetic horseshoes stamped with the Chinese dragon, but for this very reason the Chinese would have none of them. Merchants did not sufficiently study the prejudices of the people with whom they wished to trade. The Chinese were very particular about lucky and unlucky colors. They liked English sewing needles, but would not buy many of them because they were wrapped up in black paper, black being an unlucky color. Another man developed a very good trade in printed Chinese calendars, and that trade continued good until he commenced printing his calendars on green paper, when his trade closed. He wondered why until he discovered that green was an unlucky color.