

of both shall be put to port, so that each may pass on the port side of the other.

Art. 12. When two sailing ships are crossing so as to involve risk of collision, then, if they have the wind on different sides, the ship with the wind on the port side shall keep out of the way of the ship with the wind on the starboard side, except in the case in which the ship with the wind on the port side is close-hauled and the other ship free, in which case the latter ship shall keep out of the way; but if they have the wind on the same side, or if one of them has the wind aft, the ship which is to windward shall keep out of the way of the ship which is to leeward.

Art. 13. If two ships under steam are meeting end on or nearly end on so as to involve risk of collision, the helms of both shall be put to port so that each may pass on the port side of the other.

Art. 14. If two ships under steam are crossing so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

Art. 15. If two ships, one of which is a sailing ship and the other a steamship, are proceeding in such directions as to involve risk of collision, the steamship shall keep out of the way of the sailing ship.

Art. 16. Every steamship, when approaching another ship so as to involve risk of collision, shall slacken her speed, or, if necessary, stop and reverse; and every steamship shall, when in a fog, go at a moderate speed.

Art. 17. Every vessel overtaking any other vessel shall keep out of the way of the said last mentioned vessel.

Art. 18. Where by the above rules one of two ships is to keep out of the way, the other shall keep her course subject to the qualifications contained in the following Article.

Art. 19. In obeying and construing these Rules, due regard must be had to all dangers of navigation; and due regard must also be had to any special circumstances which may exist in any particular case rendering a departure from the above Rules necessary in order to avoid immediate danger.

Art. 20. Nothing in these Rules shall exonerate any ship, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

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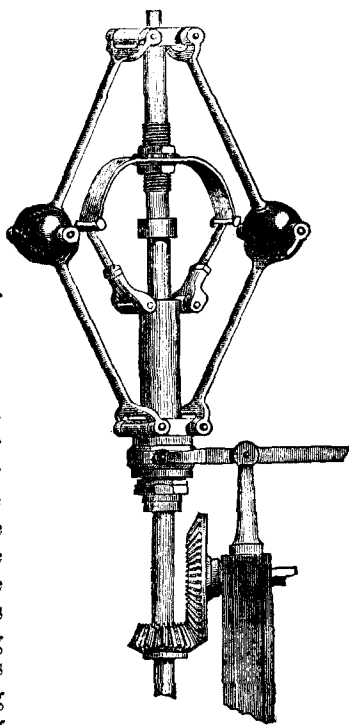
*Description of Jenkins and Jumelle's Governors for Steam Engines.*  
By H. HOWSON.

This invention by C. C. Jenkins and F. Jumelle of Philadelphia, consists in combining with a governor or spindle, a spring and rods arranged to form a knee joint, in the manner hereafter described, so that the force applied to overcome the rigidity of the spring, may

be transmitted through a leverage constantly increasing as the resistance of the spring increases, thereby equalizing the action of the spring.

The weighted arms of the governor are hung to the top of the spindle in the usual manner. To the weights of the arms are jointed the upper ends of rods, the lower ends of the latter being connected to a sleeve which is fitted snugly to, but arranged to slide freely on, the spindle. A spring is connected at a point midway between its opposite ends, to the spindle by means of nuts, which are adapted to the screwed portion of the said spindle. To one end of the spring is jointed a rod, and to the opposite end a similar rod, one rod being connected to a lug on one side, and the other to a lug on the opposite side of the upper end of the sleeve. The lower end of the latter has a recess for receiving the end of the usual governor lever through which the movement of the sleeve is communicated to the throttle valve of the steam engine. This recess formed by two collars, one of which is fast to the sleeve, the other being screwed on to the same, as is also a nut, the striking of which against a nut screwed on to the spindle, limits the downward movement of the sleeve, and consequently, the inward movement of the weights.

The sleeve is illustrated in the Figure as depressed to the limit of its downward movement, as regulated by this nut. As the governor revolves the weighted arms will fly out, and the sleeve will rise to an extent regulated by the speed of the governor, and the rigidity of the spring. Now supposing this spring acted directly on the sleeve without the intervention of the rods, it will be evident that the higher the sleeve rises through the centrifugal force of the weights, the greater will be the opposing force presented by the increased rigidity of the spring as the opposite ends of the latter are raised, consequently the governor will be irregular in its movement, the irregularity being in proportion to the difference of the rigidity of the spring as the ends of the latter are raised. By connecting the spring to the sleeve by means of the rods, however, the case is different, as they form with the sleeve and spring the well known knee-joint, so that, as the sleeve is raised, it acts on the spring through a leverage, gradually increasing as the sleeve rises, and as the rigidity of the spring increases. Thus when the sleeve is depressed to the limit of its downward movement,



the force exerted by the revolving balls tending to raise the ends of the spring, will be applied, as it were, through a lever of which the fulcrum is at a point near the centre, while as the spring rises, this fulcrum gradually approaches the farther end of the lever giving an increased leverage as the rigidity of the spring increases.

It will be evident that by transmitting the force imparted to the sleeve by the action of the revolving weights, to the spring through the medium of a knee-joint; the increasing rigidity of the spring as its opposite ends are raised, is counteracted by an increase in the force applied to raise the said ends, and consequently, that the action of the governor is uniform throughout.

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### *Description and Trial Trip of the Steamship Continental.*

In the early part of the year 1862, the Ocean Steam Navigation Company asked proposals of the marine engine builders of this city for a propeller engine, competent to develop the same power as that of their paddle wheel steamship, *Keystone State*, whose cylinder has a bore of 80 inches, and length for 8 feet stroke; number of revolutions, 15 per minute with a steam pressure of 22 lbs., cut-off at one-half the stroke.

At the same time, proposals were given for the hull, to be built from the designs of Mr. J. W. Griffith, naval architect.

The contracts were awarded to Messrs. Merrick & Sons for the engine, and to Mr. J. W. Lynn for the hull. The following are the principal dimensions of both:—

*Hull*.—Length for tonnage, 238 ft. 6 ins. Do. for deep load-water line, 221 ft. 7 ins. Breadth of beam at midship section, 38 ft. Depth of hold, 16 ft. Length of engine and boiler space, 33 ft. Length of shaft, forward of stern post, 76 ft. Draft of water at deep load line, 12 ft. Draft of water at below pressure and revolutions, 11 ft. forward, 11 ft. 6 ins. aft. Area of immersed section at 12 ft. draft, 390 sq. ft. Masts and rig, schooner.

*Engine*.—Diameter of cylinder, 50 ins. Length of stroke, 3 ft. 9 ins. Maximum pressure of steam in pounds, 35 lbs. Cut off,  $\frac{2}{3}$  stroke. Maximum revolutions per minute, 56.

*Boilers*.—Two. Length of boilers, 12 ft. Breadth or face, 20 feet. Number of furnaces in each, 6. Breadth of furnaces, 2 ft. 9 ins. Length of grate bars, 6 ft. 8 ins. Number of flues or tubes in each, 336. External diameter of flues or tubes, 3 ins. Length of flues or tubes, 7 ft. 6 ins. Heating surface, total, 4860 sq. ft. Diameter of smoke-pipe, 6 ft. Height, do. 40 ft. Description of coal, anthracite. Draft, natural. Consumption of coal per hour,  $1\frac{1}{2}$  tons.

*Propeller*.—True screw. Diameter, 12 ft. 6 ins. Length of Blades, fore and aft, 2 ft. 6 ins. Pitch, 24 ft. Number of blades, 4. Average revolutions per minute, 52.

*Remarks*.—Fitted with a surface condenser; also, with J. V. Merrick's patent double ported balanced slide valve, and with a small slide valve for warming up and starting the engine. Independent fire and bilge pump. Independent engines for hoisting cargo, and also the ashes from the fire room upon a labor saving plan devised by Mr.