THE LAMBERTVILLE IRON WORKS AUTOMATIC CUT-OFF ENGINE.

We give herewith illustrations of the Lambertville Iron Works automatic cut-off engine, constructed by Mr. A. Welch, Lambertville Iron Works, Lambertville, N. J., in which Fig. 1 is a perspective view of the engine, Fig. 2 is an indicator diagram, and Figs. 4 and 5 are elevations of the governor and attachments. Fig. 3 is a sectional plan of cylinder and valves.

The main valve, A, is of the long D slide valve type, with multiple ports at the ends through which the steam enters the cylinder. It is operated from an eccentric on the crank shaft in the usual manner, giving a positive lead and exhaust without regard to the point of cut-off. The cut-off valve, B, is operated also from the motion of an eccentric upon the crank shaft. The rod or stem, E, of the cut-off valve passes through the main valve rod, O, and slide, S. Upon its outer end are tappets, Fig. 3, which engage with corresponding tappets attached to the cut-off eccentric rod, which is pivoted to and supported centrally between the tappets by the rock arm, M, the opposite end of the rock arm having motion upon a pin or bearing in the governor slide, which is adjusted to position, up or down, by the action of the cam operated by the governor balls. The slide, S, is of cylindrical form, and incloses a spring and dash pots with disks attached to the cut-off valve rod, by means of which the valve is closed. The motion from the two eccentrics for operating the valves is relatively in the same direction, but of different strokes, that of the cut-off being greater by an amount necessary to open the multiple ports, and also with sufficient angular advance to cause the ports to be well open for the admission of steam when the engine is on its center, so that no loss is occasioned by wire drawing of the steam even at the shortest point of cut-off.

It will be seen, by reference to the foregoing description, that as the cut-off valve is opened by the tappets, the spring will be compressed to an amount equal to the difference in the strokes of the eccentrics, and that so long as the governor balls are in their lowest position the tappets will be in contact, and that no release or tripping will take place, the engine working precisely as a plain slide valve engine while this continues. It will also be seen that as the speed of the engine increases, the centrifugal force of the governor balls will lift the tappets apart until a release occurs, when the valve will be instantly closed by the reaction of the spring, and the two valves will then move together as one valve for the balance of the stroke. This operation may take place at any part of the stroke indicated by the governor.

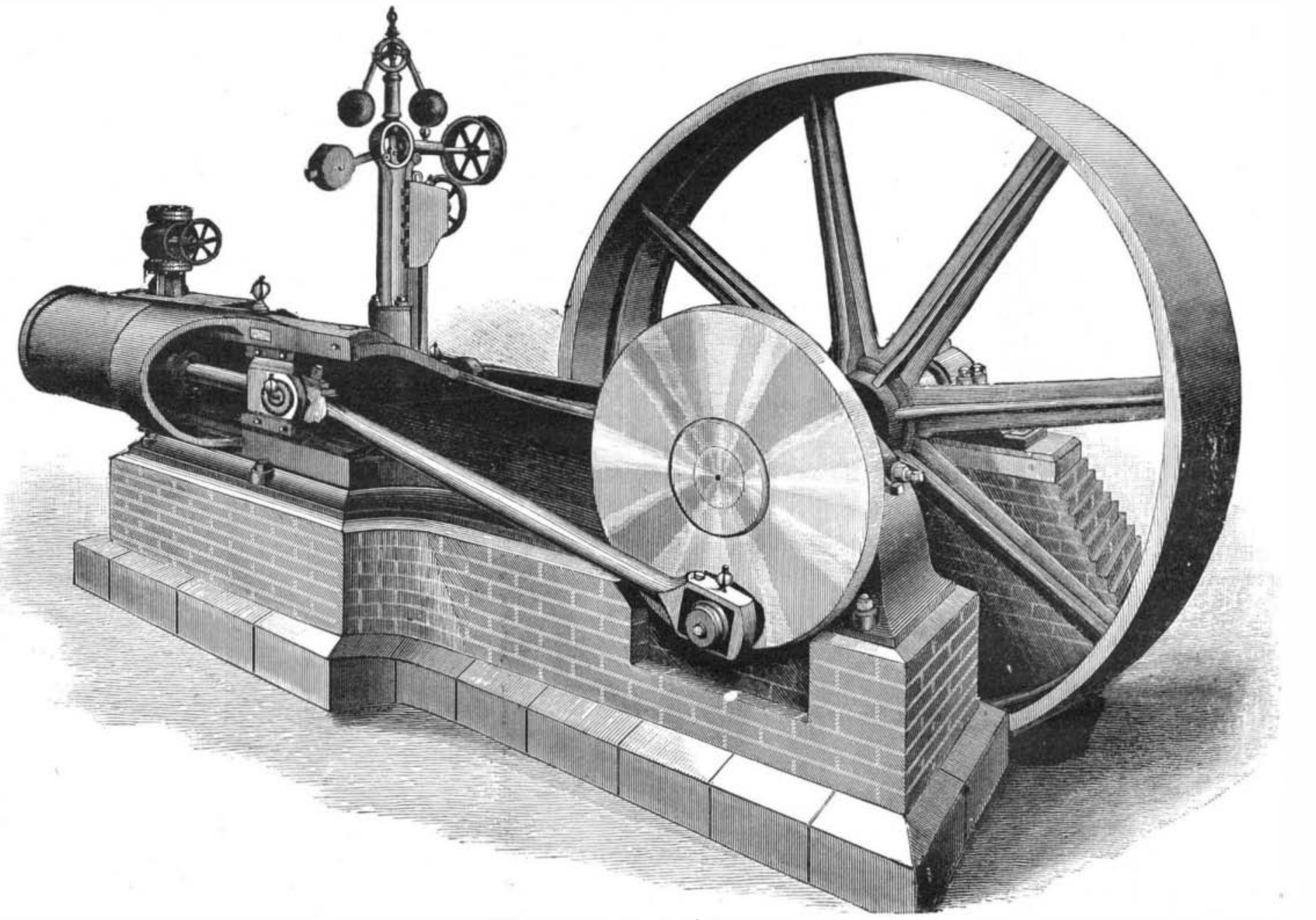
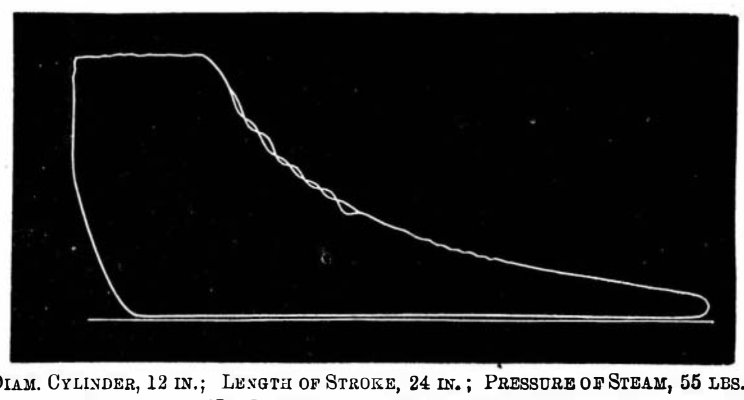


Fig. 1.—FRONT VIEW OF ENGINE.

There are two principal types of automatic engines, one being the releasing type, the other the positive type. In the releasing type the valve is closed instantly by a spring or weight, the cut-off being sharp and well defined. In the other type the cut-off valve has positive connection with an eccentric, the throw or lead of which determines the point of cut-off; and as the valve has a constant gradual motion, the cut-off is not so prompt and the steam is wire drawn, as shown by the rounded corner of the indicator diagram.

In the releasing type the governor is usually of the ordinary fly ball pattern, and has only to define the point of cut-off, which it is free to do during a greater part of the stroke, and as the adjustment required is extremely small, a high degree of sensitiveness and almost perfect regularity of speed are secured.



DIAM. CYLINDER, 12 IN.; LENGTH OF STROKE, 24 IN.; PRESSURE OF STEAM, 55 LBS.; NO. REVOLUTIONS, 110; SPRING, 40.

FIG. 2.

In the other type the governor, placed on the crank shaft, consists of weights, the centrifugal force of which is at an equilibrium with springs for the desired speed. By this arrangement, where the cut-off valve is unbalanced there are but two brief moments in each revolution where an adjustment of the weights and springs can take place should a change of speed occur; and as the amount of adjustment required is comparatively great, the regulation is correspondingly difficult and imperfect. For this reason, to increase its sensitiveness and obtain a better regulation, it has been found advisable to run engines of this class at a much higher speed than has been possible with the releasing type, the positive connection of its valve gear rendering it specially adapted for this purpose. The unsatisfactory performance of one class at a high speed, and the equally unsatisfactory performance of the other when run at a moderate rate of speed, forms the chief distinction in the performance of the two classes.

In the engine shown in the engraving, the valve gear, though nominally of the releasing type, and possessing all of its desirable qualities, including sharp cut off and close regulation, is also adapted to as high a speed as may be desired, as the relative motion of the valves is constant. The striking force of the tappets to open the cut-off valve is the same for all speeds, the contact being simply repeated with equal force a greater or less number of times per minute. The movement to open the valve is positive, and a failure impossible. For this reason the engine is equally well adapted to either high or low speed. This is a great advantage, as when an engine of this kind is found to be too small for its work, the speed may be increased so as to secure the required power, and the expense of a new engine will be saved.

Another noticeable feature of this valve gear is its wide range, the steam being cut off at any point from zero to full stroke, or as determined by the main valve. This is frequently very important, as in the case of rolling mills, and others, where the whole work is suddenly thrown on or off; the full power of this engine being under immediate control of the governor at all times, with but slight change of speed.

But, aside from the perfection of this valve gear as compared with others, the chief point of interest is its simplicity and free-

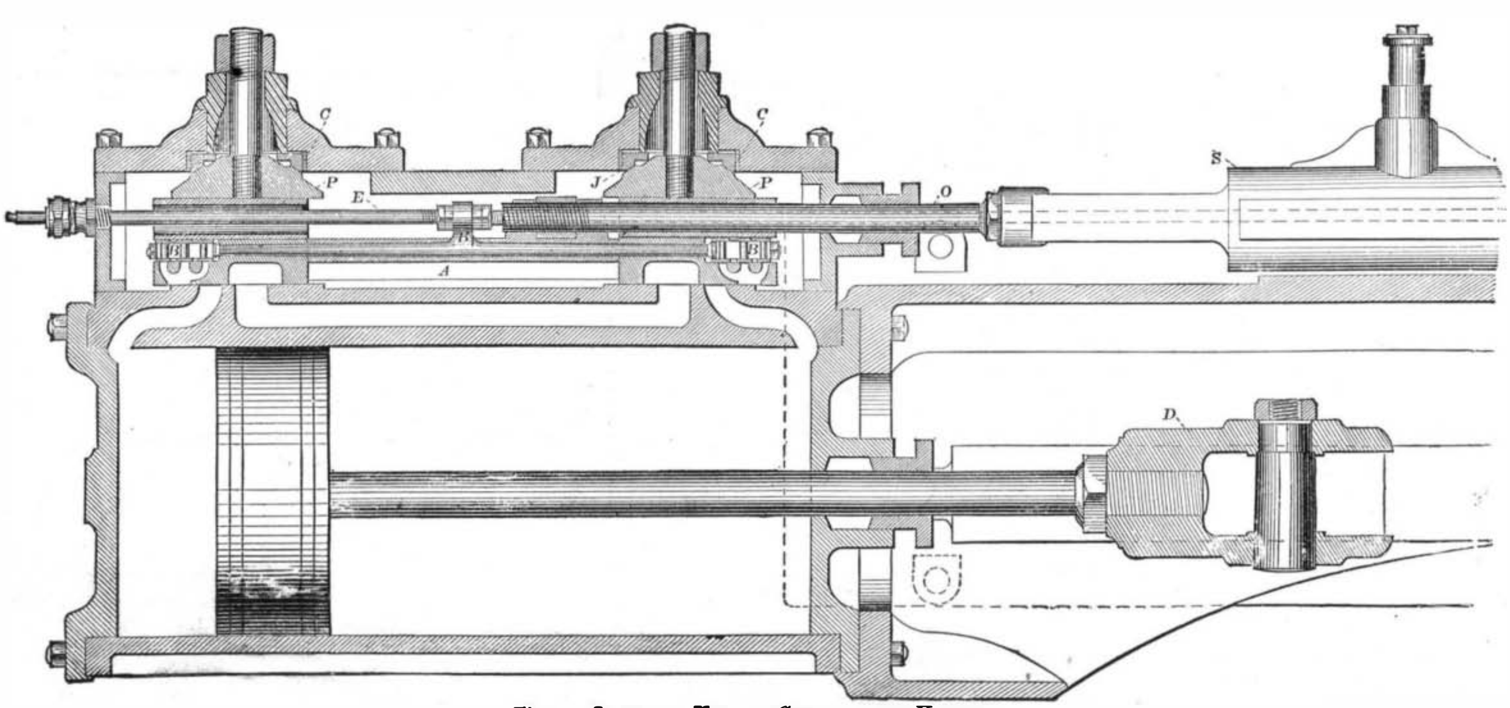


Fig. 3.—SECTIONAL VIEW OF CYLINDER AND VALVES.

dom from complication. Fewness of parts and the impossibility of derangement are of the utmost importance in the construction of automatic engines, for a saving of fuel is of little advantage, if the amount saved be wholly expended upon repairs or for expensive service to keep the engine running. The engineer capable of running a plain slide valve engine is fully competent to manage one of these

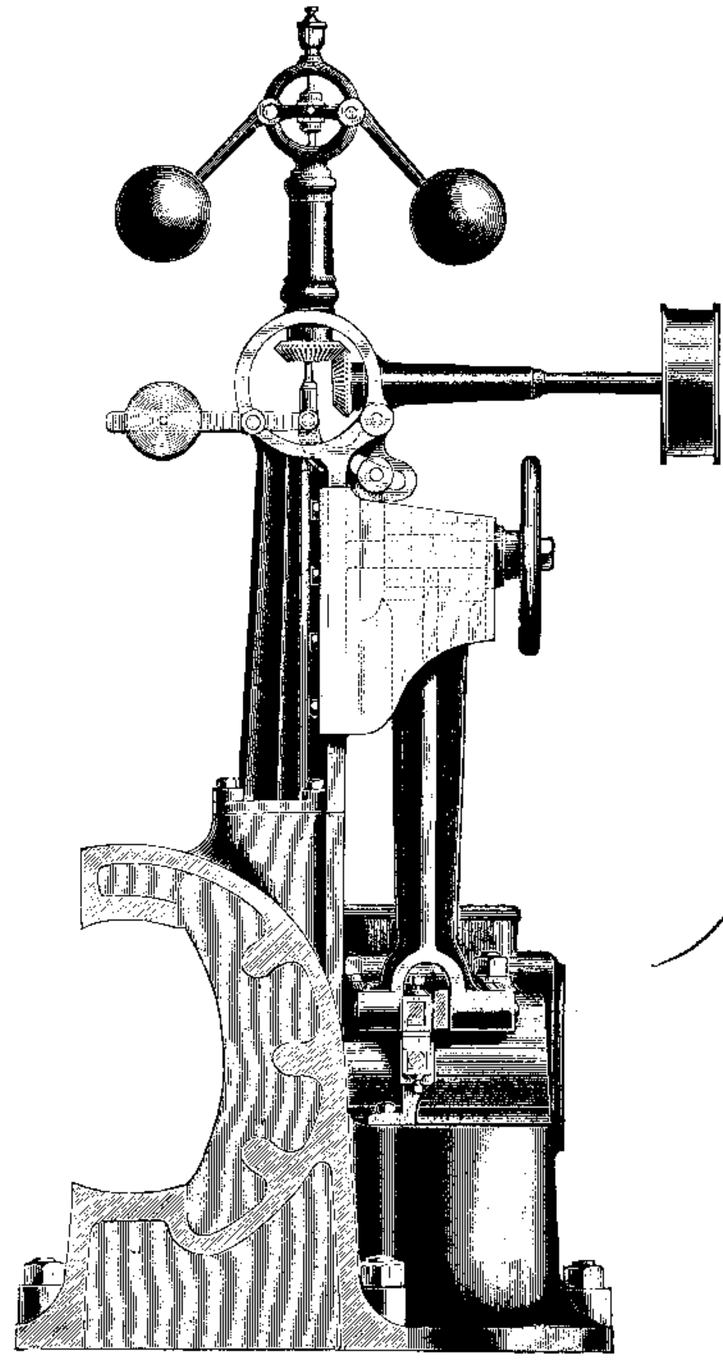


Fig. 4.—VIEW OF GOVERNOR AND SECTION THROUGH BED.

automatic engines, while the cost for repairs should not be in excess of that demanded by the plain slide valve engine.

In addition to the valve gear, we illustrate some noticeable improvements in the details of general construction. The bed has a broad base resting upon the foundation its entire length.

The bed and pillow block are cast in one piece, the distribution of the metal giving it a pleasing and massive appearance, and, at the same time, conveying the strains in the most direct manner possible.

A new feature will be noticed in the construction of the crank shaft box. The side bearings are made very broad, and are slotted to allow the cap bolts to pass through to secure the cap upon the broad surfaces of the side bearings, holding them in their proper position. These bearings are made the length of the diameter of the bore of the cylinder, and are lined with the best Babbitt metal their entire length.

The crosshead is made very long and fitted with wedge-shaped shoes, which rest upon inclined planed surfaces of the crosshead its entire length, and are adjustable by means of screws and bolts, as shown. The shoes have ample wearing surface and are lined with Babbitt metal, so that no appreciable wear should take place upon the slides. These are of cylindrical form.

The connecting rod is made solid at the crank end, the boxes being adjusted with wedge and screws in the usual manner. The boxes are of bell metal lined with Babbitt.

The crank, as will be seen from the cut, is a heavy disk or crank plate, with counterbalance so adjusted with regard to the inertia of the reciprocating parts as to insure smooth running of the engine.

The drop hook is usually made solid, without any provision for taking up the slack or wear upon the pin; and as the hook simply rests upon the upper half of the pin, the wear soon causes an unpleasant jar or knocking. To provide against this, a pair of bell metal boxes are used, the wear of which can be readily taken up without altering the length of the rod or set of the valve, and from which the hook is connected or disconnected without the use of a wrench.

The crank shaft is of best hammered iron. The crank pins, crosshead pins, piston rods, and valve rods are of steel.

The arrangement for balancing the valves of the engine consists of a heavy plate well stiffened to prevent springing, and adjustable by means of a screw and ball and socket joint, by which the perfect seating of the cover to the valve is insured, the adjustment being quickly made with the steam pressure on. This arrangement is both simple and positive.

INDICATOR DIAGRAMS.

As every engineer knows, the actual diagram from an engine, as compared with the standard or ideal diagram, other things being equal, determines the value of any particular valve gear and the economy of the engine. The curve will not in practice conform to the true theoretical or adiabatic curve, the conditions for which are impossible with cylinders made of cast iron. The terminal pressure will always be found relatively too high under the most favorable conditions, the amount being greater as the ratio of expansion increases. Where this is not the case, and the expansion curve of the diagram taken coincides with the adiabatic, the conclusion cannot be otherwise than that the leakage out is greater than the re-evaporation, for as yet we have no practical means for working steam expansively and of preserving the temperature due to the pressure while expanding. This is none the less the ultimate ideal to which less expansion and greater rapidity of working materially contribute. The diagrams here shown are such as are produced regularly by these engines, being facsimiles. They speak for themselves.

A handsome illustrated catalogue of this engine will be sent upon application to A. Welch, Lambertville Iron Works, Lambertville, N. J.

Mental Characteristics of Mr. Gladstone and Lord Beaconsfield.

All who have watched the brilliant career of Mr. Gladstone, particularly during the last twenty years, must be conscious of the fact that even his excellent "constitution"—if we may be permitted to use that banned but expressive term—has been often severely tried by the vigor of his brain and nerve power. To the physiologist, who recognizes the interrelation of those parts of the being which some try to separate, and speak of apart, as "mind" and "body," the study of such lives as those of Mr. Gladstone and the late Lord Beaconsfield comparatively with the ideal standard of perfect humanity is intensely interesting.

Lord Beaconsfield had a vigorous but not a thoroughly cultured brain. The development of his cerebral and nervous organism was not, so to say, general, and equal throughout. He had excellent parts and extraordinary intellectual fervor, with a strong will and an immense power of self-restraint; but it is no disparagement of the noble lord's physico-mental organism to chronicle the physiological fact that his brain lacked, and not unfrequently gave unmistakable evidence of lacking, that high coherent development which is only to be obtained by early and persistent mental discipline and culture. He was rather brilliant than grand, as studied from a psychological standpoint, and it was a physiological consequence of his brain type that his policy was one rather of finesse and dazzling energy than of persistent growth of purpose.

Mr. Gladstone, on the other hand, is possessed of a brain which has been physiologically developed by training and exercise commenced in youth and continued far into adult life with an intense struggle for self-improvement by intellectual discipline and industry, and his mind and nerve power are supported by a very considerable amount of sensory and muscular strength and energy. The perils of his life have ever been those of "overwork" in its truest sense. Brain function has frequently outstripped bodily strength; and if his constitution—we again dare to use this word for want of a better—had been a little less strong, if the recuperative power of the organism as a whole had been only a little less considerable, the right honorable gentleman must on several occasions have broken down. The so-called "irritability" of temperament which Mr. Gladstone has, in some of his most trying sessions, been observed to evince, has been the outcome of an over-active rather than a weak nervous system. If it were possible, the right honorable gentleman would even now exhaust his reserve of nerve force by the energy of his great intellect at an age when other men of his caliber have shown symptoms of waning energy.—*Lancet.*

Lack of Encouragement to Inventors.

If inventors were to rely solely upon the commendation of their friends or the public as an inspiration to labor, says an exchange, the source of which is unknown to us, there would be few great inventions. The world looks upon inventors as a visionary and unpractical class of people, who merit only condemnation and ridicule. Just before Singer completed the invention of his now famous sewing machine, even his fellow-workmen in the shop where his experimental machine was being constructed left him in disgust, thinking his invention a failure. When Westinghouse tried to introduce his air brake, he met with the most chilling rebuffs, both in this country and in Europe. Edison, whose inventions are the marvel of the present century, has been the object of unstinted abuse and ridicule. Some of the greatest creations of his wonderful inventive mind were characterized as stupid failures until the demonstration of their successful operation overcame this hostile criticism. Even Thomas and Gilchrist, whose recent invention of the basic process of steel making is among the wonders of modern invention in metallurgical science, have come in for their share of discouraging criticisms and rebuffs. Thus might we go through the whole list of inventors, from the earliest days to the present, and few would be found who have not experienced the unkind and unmerited opposition, not only of the general public, but in most instances of their own personal friends. The testimony of Fulton, Watt, Franklin, and a host of others renowned in the past for their wonderful discoveries would corroborate this statement and furnish forcible evidences of its truthfulness.

Inventors, as a class, are very sensitive to criticism. A part of the reward which they hope to obtain for their invention is a public recognition of its value. None but an inventor can tell how disheartening are the unkind and unsympathetic criticisms which he is forced to listen to; and these criticisms are harder to bear because in most instances they are as unjust as they are unkind, often displaying the ignorance and superficiality of the speaker. That inventors are sometimes unmanned by the ungenerous manner in which their inventions are received is not surprising. A gentleman in one of our Western towns, after years of study, has finally brought forth a very meritorious invention. During all these years he has met the studied opposition of his family and friends. His sons have even carried their opposition so far as to

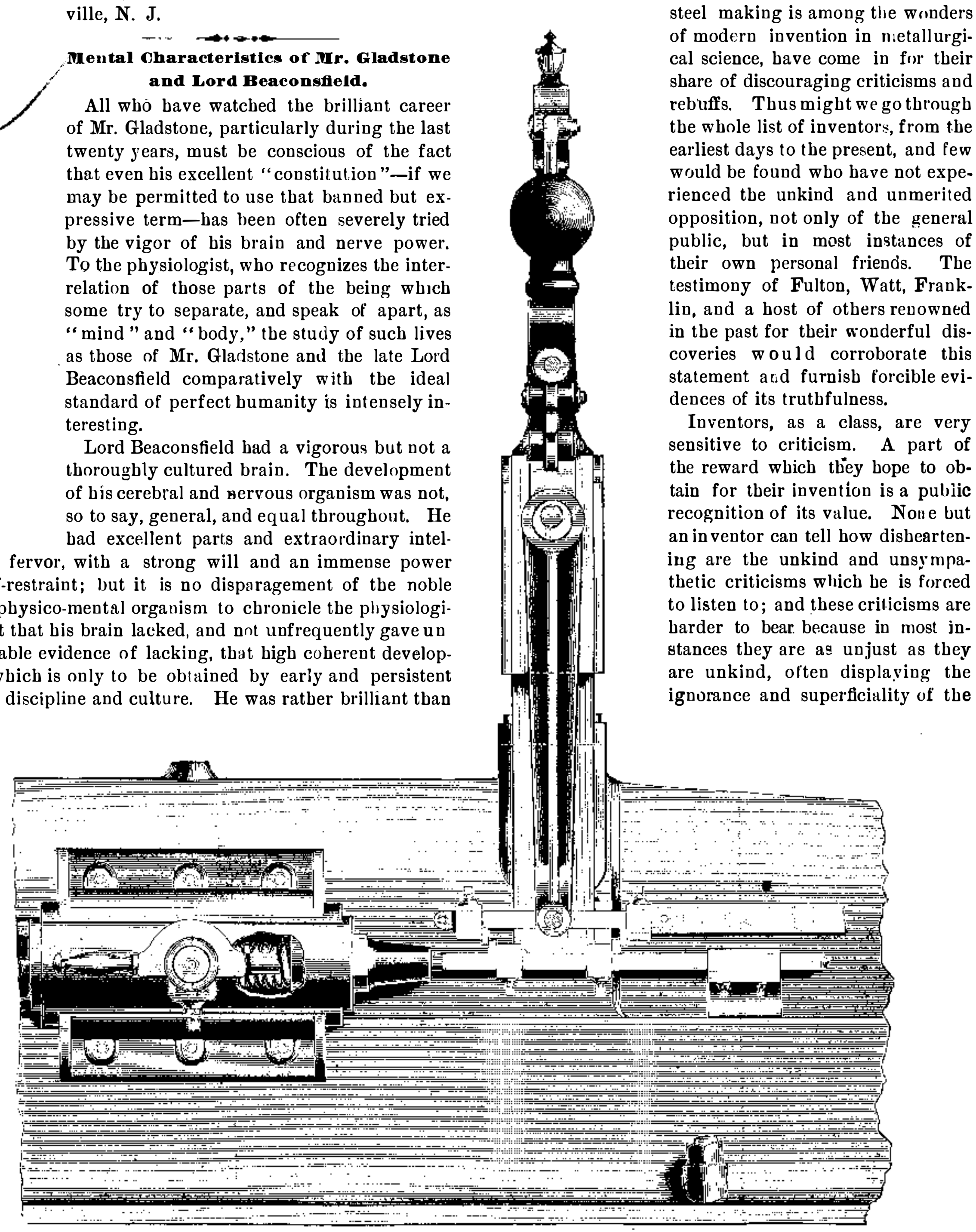


Fig. 5.—GOVERNOR—SIDE VIEW.

refuse to contribute a single dollar toward helping him introduce his invention, now that be has obtained a patent for it, and the result is that, wearied out by the discouragement which his family and friends have placed in his way, he has become prostrated. If, at last, the world shall come to prize his invention for what it is worth, and he shall derive—as he may—a fortune from it, these undutiful sons will, no doubt, be the first to claim a share in the wealth thus obtained.

The man who strives to perfect an invention, whether successful or not, is entitled to the commendation of his fellowmen. We have never sympathized with those who speak sneeringly of that much-despised class of inventors, those who have striven to solve the problem of perpetual motion. Mistaken and erratic as they may be. they are engaged in a line of duty which is, to say the least, honorable and elevating. Thousands of inventions there are to-day that the world calls valueless, which, were they placed in practical hands, would prove most useful and beneficial, and a source of wealth to the owners.

Inventions, as a general thing, are an innovation on present customs or modes, and are therefore a step in advance of present thought. A century since, had any one suggested that one could stand in his own home and hold converse with a frend fifty miles away, he would be thought to be talking nonsense. Had any one at that time said that the mail would be carried from New York to Chicago in a day, he would have been considered equally as foolish. The prediction that messages could be sent on lightning's wing beneath the ocean from this continent to the Eastern continent would have been hailed with ridicule. These inventions were steps far in advance of the thought or knowledge of those days. It does not militate against the greatness of the discoveries that made all these things possible that the dull brain of the masses could not comprehend them until they were practically displayed to the world. The further he is in advance of the present thought or knowledge of the masses, the greater will be the opposition which the inventor will have to overcome before he will attain a just recognition of his labors.

A great inventor must be a man of independent thought, a man of nerve and courage, a man of hopefulness and of determination. Many an inventor has been turned back, even when his feet were pressing the threshold of a great discovery, because he had not courage to stem the tide of opposition which he was encountering. Many a practical invention has been dropped before completion because of the inventor's discouragement and lack of push and determination. Twelve years ago a certain inventor filed in the Patent Office at Washington an application for a patent for the invention of a certain article. On some technical grounds the patent was disallowed. The inventor, in the meantime, had been discouraged by his friends, and so ceased pressing his claims. What, then, must be his surprise to find his invention now in quite general use, years after he had surrendered it to the public. The experience of this man is but a sample of the experience of thousands of others.

It is a surprising thought, when contemplating what invention has done for the progress and civilization of the age, that inventors meet with such a tardy recognition of their works. The wonder is that they are not held in higher esteem. The world could afford to pension its Stephensons, its Morses, its Bessemers, its Edisons, and its Bells. It has erected statues to some of these, and it can afford to erect statues to all its noted discoverers. In olden times men of scientific attainments were held in high esteem. Why ought they not to be held in a like high estimation to-day?

We grant that the names we have given above are so held, but there are untold thousands of names of inventors of useful things, valuable and indispensable to the world, that should be placed in glowing letters on the scroll of fame. Our inventors need encouragement when they are alive, not after they are dead. Men do not work simply to gain a fitting epitaph. Their needs are in the present, and the earlier the world recognizes and applauds their work, the better will it be for them and the inventive art.

The Loss of the City of Brussels.

The sinking of an Inman steamer at the mouth of the Mersey appears, at first sight, to be an almost incredible event. Liverpool passenger steamers have come to be regarded as at least as safe means of transport as railway trains; and it is not too much to say that a railway journey of 3,000 miles performed in any country would be attended by as much risk as a voyage across the Atlantic in one of the ships of this celebrated fleet. The precautions taken to insure the safety of passengers by the Cunard and other companies leave absolutely nothing to be desired. The Cunard steamers, for example, are now, and have for some time back, ceased to be either the largest or fastest crossing the Atlantic; but as regards safety they enjoy an unrivaled reputation.

The announcement that the City of Brussels had been sunk, and that several lives had been lost close to Liverpool, was at first received with doubt. It remains of course to be proved that the officers of the ship are in no way to blame for the catastrophe. With the details of the collision, which sent a fine steamer to the bottom, our readers are, no doubt, familiar; but it may be worth while to place the fact on record in our pages for future reference. On Sunday morning there was a thick fog in the Mersey, which extended some way out to sea. The Inman steamer City of Brussels had made a very satisfactory passage from New York to Queenstown, and a good run from Queenstown to the mouth of the Mersey. Then the fog settled down, and no further progress without extreme risk became possible; so Captain Land, who was in command of the ship, as soon as he heard the sound of the fog bells of the North-West Lightship, turned the ship's head to sea, stopped her engines, and allowed her to drift up stern first toward the bar. It is stated that he kept his whistles going at half minute intervals. Forty-one minutes after the engines had been stopped the sound of another steamer's whistle was heard, and immediately afterward the City of Brussels was struck on the starboard nearly amidship by the Kirby Hall, a new steamer on her trial trip from Glasgow. The Kirby Hall, a ship of about 1,500 tons, cut well into the City of Brussels, making a hole, it is said, 8 feet wide, and below the water line. The Kirby Hall had her own bows twisted, but it does not appear that she suffered any serious injury. She has a large rent in her plates from the 18 foot watermark to the 24 foot. She was flying light, and to this fact she probably owes her safety, as she made, we understand, little or no water, all her injuries being above the sea. Captain Land and his officers did all that men could do, and succeeded in saving the lives of nearly all on board. The discipline of the ship was perfect, the boats all ready for launching, and the result was, on the whole, satisfactory. Several lives, however, were lost, eight of the crew and two passengers, Italians, being drowned. So much for some of the facts concerning the catastrophe. Let us see what is the lesson it conveys; for there is no such thing as an accident. Nothing happens without a cause, and if we rightly understand what caused a given "accident," it is possible that we may be able to avoid its recurrence.

The first point worth notice is that the case of the ship, after she began to leak, was hopeless. Nothing could be done to keep her afloat. But, nevertheless, unaided as she was by any assistance from her crew, she did not founder for about twenty minutes. Now, even the sinking of ships is effected according to rule and law by nature. Not one pound of water less than a certain quantity would have sunk the City of Brussels, and the rate at which this water got into her was fixed by immutable rule. The City of Brussels was 390 feet long, and 40 feet 3 inches beam. Her gross tonnage was 3,774; her net tonnage, 2,434. Her bunkers must have been nearly empty, and would represent a space capable of holding, say, 800 tons of water. She had a valuable cargo on board, but not, we fancy, a heavy one. If we say that her margin of floatation was equivalent to 1,800 tons or so, we shall not, we think, be far short of the mark. To sink her she must therefore have taken 1,800 tons of water on board. It is quite certain that some obstacle intervened to prevent the water from finding its way through the whole ship at once, because, if a hole 8 feet wide had been knocked in her side, assuming it to be only 4 feet deep below the surface, she would have taken in enough water to sink her in less that five minutes, the head rapidly augmenting as her bows sank.

The ship was, however, divided by watertight compartments, and probably a single compartment was rapidly filled, and this having been done, her head was so far pulled down that water found its way over the deck to which the bulkhead extended, and thence ran aft. The ship, however, went down by the head; and it is noteworthy that she remained afloat until the water reached the bridge. The City of Brussels had nine bulkheads and seven watertight compartments; and it is said that the reason why she foundered was that the Kirby Hall struck her just at the end of a bulkhead, and so knocked two compartments into one. This is, however, to a large extent, pure conjecture; and even if it is true, then the circumstance supplies another argument in favor of so constructing bulkheads that two compartments cannot be knocked into one. How this is to be done we explained fully in the *Engineer* for June 14, 1878, page 416.

Be this as it may, it is clear that if the bulkhead had been more efficient, the City of Brussels might now be lying in dock in Liverpool. But assuming that the bulkhead was what it was—inefficient beyond a certain point—it is easy to see that, had very moderate pumping power been brought into play, the ship could have been kept afloat. The utmost quantity to be dealt with was, say, 2,000 tons, to be lifted, say, 20 feet in twenty minutes. This represents but 40,000 foot tons, or 4,480,000 foot pounds per minute, or 135 horse power; or, making large allowances for waste, an engine of 250 indicated horse power, properly used, would have kept the water pumped out of her as fast as it came in. She had an ample supply of steam available, and one large centrifugal pump would, in all probability, have sufficed to save her. Assistance was close at hand, and even with one compartment full she might have been towed to a place of safety, her own pumps dealing with what we may term the overflow over or past the bulkhead. The ship and her cargo have been valued at £300,000. We speak close to the truth if we say that a pump and engine of the required power could have been had for £1,000.

We are happy to know that in most of the great passenger steamers recently built immense pumping power has been provided; but the City of Brussels was thirteen years old, and sufficient importance was not then attached to pumps; and here we may hint that the various Liverpool companies running passenger steamers across the Atlantic would find it immensely to their advantage if they could state in their advertisements that their ships were fitted with appliances which would deal with huge leaks. The passenger public at both sides of the Atlantic is very discriminating, and it would not be slow to understand which was the safest ship.

Two other questions remain for consideration. Was the City of Brussels provided with any special sound signaling apparatus which would denote which way her head lay, and whether she was or was not in motion? We believe she was not; that, in short, she had nothing but he ordinary steam whistle. Is it not time that a universal code should be adopted, which would be intelligible to all ships, and which would tell an advancing steamer that, "I am here, lying with my head to the west, drifting astern," or "I am going dead slow with my head to the south." There is no want of such sound signals in the market. Another question is, When will ship owners or the Board of Trade, or "Lloyd's," or the Liverpool underwriters, take the bulkhead problem in hand? It is a noteworthy fact that this is a subject on which the Institution of Naval Architects never touches. Those who read papers and those who discuss them alike seem to regard the matter as tabooed. If it is referred to at all, it is so only in connection with ships of war. We know that among ship builders there is a rooted contempt for bulkheads, and this is not to be wondered at, seeing that they themselves have done their utmost to make them contemptible. As they are usually fitted, they cost some money—not much, it is true—they are a nuisance to the owners, coming as they do more or less in the way of cargo, and they are absolutely worthless. We shall feel indebted to any one of our numerous readers who can give us particulars of a single case in which bulkheads prevented a ship from foundering. We do not now refer to collision bulkheads, which are almost invariably well made, well designed, and therefore quite efficient. We refer to the other bulkheads, which, if as good, would be as useful.

By only too many persons it is assumed that the modern passenger steamer is as safe as she can be made. The foundering of the City of Brussels is proof that she is not safe, and there is a universal consensus of opinion among engineers, at all events, that passenger steamers can be made much safer than they are. If the time of foundering in case of collision could always be delayed by some few hours, an immense advantage would be gained; and it really appears that if those most concerned would do what can be done to secure this end, a great deal might be effected. It requires, we hold, but a moderate effort on the part of Lloyd's and the Board of Trade, and the thing could be done. Unless they act, bulkheads will probably continue to be delusions and snares to the end of time.—*The Engineer.*

The Steam Engine and the Telegraph.

Mr. Courtney, in presiding at the annual meeting of the Royal Cornwall Geological Society at Penzance recently, referred to the introduction of the electric telegraph and the invention of the steam engine, by which electricity and steam had been made our slaves in almost all the operations of life. No doubt, these were most remarkable applications, and we in the present day were greatly indebted to them, but at the same time he was bound to say that in his opinion we might overrate the debt. The conveyance of news by the telegraph was insignificant if the news itself were not of importance. As to the diminution of toil which steam effected in supplying our wants, it depended very much on the use we made of it, and how far that did or did not confer a benefit on mankind. Was it a fact that owing to the introduction of steam the labor which was necessary for the subsistence of the multitude had been in any sense diminished, and the ragged edge of pauperism which surrounded the borders of society had in any sense disappeared? We might derive either of two advantages from the introduction of steam—we might either make life less toilsome while maintaining the mass of it as it was, or keep up the toil of life while increasing the mass, and he was afraid the result of the discovery of steam power had been an increase in the number of human beings rather than an improvement in the quality of life. He was, indeed, more disposed to reverence science for its educational than for what he might call its economic advantages, for the way in which it elevated the mind of man rather than for its ability to enable more men to live on the same low level on which men lived before, and it was because he believed in geology, and its kindred science, astronomy, as most powerful helps to the elevation of the mind of man that he was willing to pay his humble respects to those who prosecuted those particular sciences and conveyed to others their blessings.

Absorption of Hydrogen.

A. TSCHIRIKOW.

It has been shown by W. Hempel that hydrogen is completely absorbed by palladium sponge at 100°, and he has used this as a means of separating hydrogen from a mixture of gases. In order to test the applicability of this property to the estimation of hydrogen evolved in sealed tubes, the author treated zinc with hydrochloric acid in a sealed glass tube containing a palladium spiral. The proportions of acid and zinc were such as to produce a pressure of twenty-five atmospheres if no hydrogen were absorbed by the palladium. The absorption was found to be complete. A small portion of the hydrogen had united with the oxygen of the air remaining in the tube. Nearly the calculated amount of hydrogen was obtained from the palladium spiral by heating to 350°. The evolution of the gas was so regular that the author suggests the heating of palladium-hydrogen as a means of obtaining chemically pure hydrogen.—*Amer. Chem. Jour.*