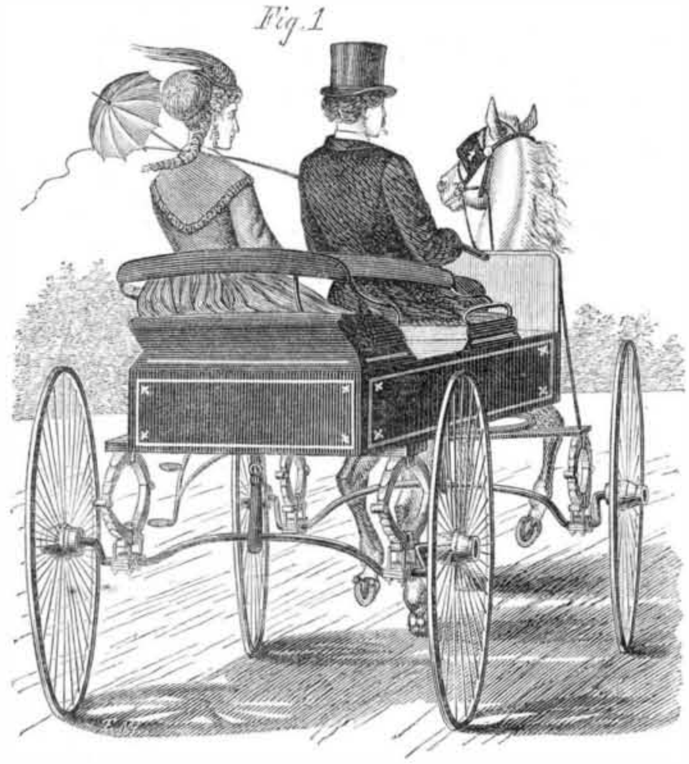
JACKSON'S PATENT OSCILLATING WAGON.

We not long since hazarded the opinion that there was great room for improvement in all sorts of draft vehicles, and the prediction that ere long such improvements would be at least attempted.

We now present to our readers an improvement which appears to us of value, and is equally applicable, in principle at least, to any kind of draft vehicle. Its application to horse cars, provided no insuperable practical difficulty should be met with in the attempt, would greatly lighten the severe labor of starting the cars, and thus relieve the much overtasked horses.

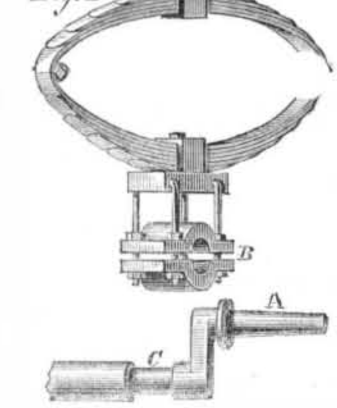
The object of the improvement is to permit a certain amount of motion in the body of the wagon and its load, backward and forward, relatively to the points of the road on which the wheels rest, so as to give greater ease to the horses in drawing and to those riding in it; while, at the same time, it obviates the rigidity of the parts of a wagon constructed in the old style, and thus takes away much of the shock and consequent liability to breakage.

Fig. 1



These objects are accomplished by simply giving a crank angle to each end of the axles, and, instead of uniting the springs and boxes to the axles by rigid connections, resting the upper parts on turned journals fitted with boxes, as shown in detail in Fig. 2. The general appearance of a carriage with this improvement attached is shown in Fig. 1.

Fig. 2



In Fig. 2, the precise method by which this attachment is made is distinctly shown where the springs are placed at right angles to the axle; but it is necessary to state that the position of the springs may be changed without in any way affecting the principle of the improvement. A is the ordinary journal upon which the wheel runs. B the box attached to the lower part of the spring in the manner shown in the engraving or in any other manner specially applicable to the particular vehicle upon which it is desired to put the improvement; and C the journal working in B.

At first glance it will be evident that the swinging motion thus secured in the axles, and the consequent oscillation of the body and load, will greatly relieve the structure from the shocks consequent upon the impact of the wheels against obstacles. How it would act to assist the horses in drawing the vehicle may not be so obvious. We will endeavor to make this plain.

The normal position of the cranks of the axles when the vehicle is at rest, is at the lowest point of the arc of oscillation. The draft is applied not to the axle but to the upper spring bar—or where springs are not used—to the parts supported by the box, B, Fig. 2; therefore the moment the horses start, the load is swung forward so that the journals, C, stand forward of the centers of the wheels; the distance to which they will move depending upon the amount of resistance which the wheel has to overcome. Now suppose the wheels to be so "blocked" that a team would be totally unable to start a wagon of ordinary construction, of the same weight and carrying the same load as the wagon under consideration. The team on this wagon is able to move the body and load while the wheels are standing perfectly still. The momentum of this load and the body is added to the strength of the horses when the real tug comes, and the obstacle is at once surmounted.

We are not only sure this is correct in theory, but we have proved it by experiment on the small model from which the accompanying engravings have been executed, by means of a cord and pulley, and observation of the weight necessary to overcome an obstruction, with the axles wired so that they could not oscillate, and also with them free. In the latter case, a given weight will draw the wagon over an obstruction placed a little in front of the wheels, which is wholly unequal to the task when the axles are held rigidly. If the principle is proved sound for large obstructions it must also be true for smaller ones, and therefore we think the inventor justly claims a lighter draft for this wagon than can be obtained with a fixed axle.

Collateral advantages are, diminished noise and the softening of all the motions of the vehicle. For farmers' wagons, trucks, traveling wagons, and specially for all vehicles without springs, we deem this improvement an important advance on the old mode of construction, while to those which employ springs, it will add comfort and durability.

This improvement was patented through the Scientific American Agency, April 6, 1869, by Samuel Jackson, 149 High street, Newark, N. J., at which place he may be addressed for further particulars, and where the improvement may be inspected.

Steam Agriculture.

The following from the letter of a correspondent to an English agricultural paper, is worthy of more than a passing thought. The public does not yet begin to comprehend the part which steam is now performing in the industries of the world. Much less the magnitude of its future.

"It is a fact," writes this correspondent, "that I am now harvesting my *fourteenth crop* under steam culture.

"It is a fact that Nos. 1 and 4 heavy lands are bean-growing on seed bedscosting only 7s. 3d. an acre; that they are strong in straw, well corned, free from fly or blight, and ripening well, unlike many a crop now growing upon shallow, horse-worked land, that may be seen to be weak in straw, full of fly, and dying a premature death.

"It is a fact that my Nos. 2 and 3 heavy lands are wheat-growing on seed beds costing only 6s. 9d. an acre; that they are strong in straw, full of corn, and ripen well; together they are the best I ever had on this land in my life.

"It is a fact that these four fields will give me an average of full 40 bushels per acre, and it is a fact that under horse culture (having a dead fallow every fourth year) they did not average over 20 bushels per acre, one year with another.

"The next fact to be looked to is, what do our best farmers on such soils get now-a-days under horse culture? Mr. Whitworth, of Willen, a mile from here, is a good farmer under horse culture. He occupies three farms—one where he lives, one at Woughton, only a mile from here, and one at Mursley, about six miles from here. To prove that he is a good farmer, let me tell you that he has made money by farming. Two years ago he bought with his earnings his Woughton farm for over £11,000; therefore I need not say any more on that point. On his Woughton farm he has six fields of plowed land exactly in character with my heavy land, on the same hill, and within a mile of it. This year three of his fields are wheat, one beans, one vetches, fed on and fallowed for next year, and the other clover, fed on, and is now being fallowed for next year. The worth of this feed for sheep, after paying all the expenses for seeding and shepherding, is but a mere trifle; I estimate it at 5s. per acre. Now, then, for the produce on the three fields of wheat and one of beans; it is not over 35 bushels per acre, or from an acre of each added together only 140 bushels. When divided by six, to spread the 140 bushels over the six fields, we find the average to be only $23\frac{1}{3}$ bushels per acre; to which must be added 1s. 6d. as a share of the value after payment of expenses, for sheep-keep on the two fields of vetches and clover. I do not ask Mr. Whitworth's permission to make this statement, but I state it openly and fearlessly on behalf of steam culture against the best horse culture. Let him or any other man pull me back in the correctness of it if he can. I know that it is true, and I mean that the world shall know it. Had I taken bad farming for my comparison, the average would have been less than $23\frac{1}{3}$ bushels, with 1s. 6d. for sheep-keep to be added per acre, against my 40 bushels per acre.

"I ask you to publish these few facts to help me to open the eyes of the landlords and farmers of England as to the use and value of steam power to culture, and in addition to what I have stated above, I will state here that my light land crops are excellent, without troubling you with particulars.

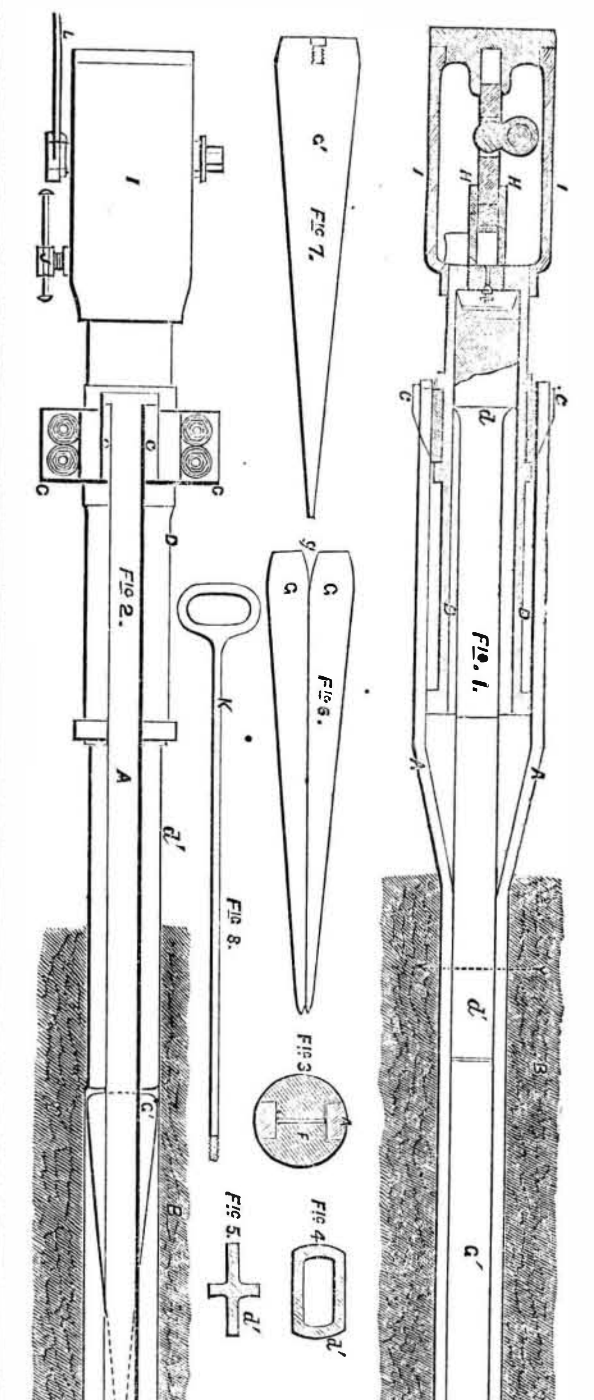
"I might have stated another fact, that this heavy land of mine always needed four good horses to plow it from 5 to 6 inches deep, which cost fully 14s. per acre; whereas by steam power I can now make an average seed bed for 7s. an acre year after year, and keep my land clean for corn crops every year."

Newest Coloring Matters.

A lecture has been given by Mr. W. H. Perkin, at the Royal Institution, "On the Newest Coloring Matters." Among the many interesting facts then put forward was the discovery of a beautiful blue color, by a German chemist, on treating rosaline with sulphuric acid. Unfortunately, it was not a "fast color." A dyer made many trials therewith, in the hope of turning it to account, but all in vain. He happened to mention his difficulty to a photographer, who, knowing that hyposulphite of sodium would fix a photograph, recommended the dyer to try that. The trial was made; when mixed with the hyposulphite, the blue became a beautiful green, and, better still, a "fast color." This was the origin of that brilliant dye commonly known as "Night green," because of its remaining unmistakably green in appearance when seen by artificial light. Let it be remembered that nearly all the new colors are extracted in some way from coal tar, that the first was discovered not more than thirteen years ago, and that the annual value now manufactured is £1,250,000, and it will be seen that in the industry created by these new products there is an admirable example of the results of scientific investigation. The best of it is that the field is inexhaustible; for many years to come it will yield a rich harvest of discoveries.

PREVENTION OF COLLIERY EXPLOSIONS.

Many of the most calamitous explosions in collieries have been clearly traced to the ignition of the fire-damp through the firing of shots; and in a still larger number of cases there



has been much presumptive evidence of the same cause having existed, although absolute proof was wanting.

The *Mining Journal* of London, from which we extract the substance of the present article, refers, as a corroboration of this statement, to the Edmunds Main Colliery explosion, which, it will be recollected, resulted in the loss of 60 lives, and which actually occurred through the blasting operations; and at the Oaks colliery, only a few miles from it, where some 324 were killed, and in regard to which little doubt is entertained by practical men that it was to the firing of the shot at the steps to the back workings, that the fearful casualty was due. Now, that the use of gunpowder does very much facilitate mining operations, is beyond question—the power is easily applied in the desired position, and the amount of work done with a given expenditure of manual labor is sufficiently large to satisfy the workmen. But, valuable as blasting agents are, in ordinary cases, it can be readily understood that, to explode gunpowder in the immediate neighborhood of so explosive a gas as that of fire-damp is, to say the least, anything but a safe operation, more especially when conducted, as it is in coal mining, in a comparatively small and inclosed area, from which escape is practically impossible. It cannot, therefore, be surprising that the desirability of abolishing the use of gunpowder in coal mining should have been acknowledged, or that so competent an authority as Mr. Geo. Elliot, M. P., for Durham, in his excellent address to the North of England Institute of Mining Engineers, should have pointed to the discovery of a means of superseding gunpowder in collieries as one of the most important that could be made.

Messrs. Jones and Bidder, of England, have made an invention, illustrated in the accompanying engraving, intended for breaking down coal, slate, and other minerals, without the use of powder. Instead of the usual blast, two or more wedges are caused to be driven consecutively by hydraulic or screw power between the surfaces of the substances to be broken down. The arrangement of apparatus for this purpose may be variously modified, but by preference they employ apparatus constructed as follows: Two tension-bars or rods, either formed of two separate pieces or of one looped piece, are inserted into the hole cut in the coal or other substance, the outer ends of which bars are connected to the cylinder of a hydraulic ram or press, or to the framing, or screwed nut or boss carrying a screw spindle. Between the tension-bars, at their innermost end, is placed a clearance-box, and then two metal pressing blocks, between which is afterwards forced first a single wedge by the action of the ram of the hydraulic press, or of the screw spindle; the ram or screw spindle is then withdrawn, and a second wedge is inserted, either between the one side of the first wedge and that of one of the pressing blocks, or the first wedge may be made as a split wedge, and the second wedge be driven between the two parts thereof. If requisite, a third wedge may, in like manner, be driven in, and so on until a sufficient wedging action is obtained to effect the breaking down of the mass desired to be removed. The wedges and pressing blocks may be formed either so as to cause the pressing blocks while expanding to retain at first a position parallel to each other by making these with inner inclined surfaces, similar to the inclined surfaces of the wedges, or they may be arranged so as to form from the commencement a gradually increasing angle with each other. The wedges can pass beyond the pressing blocks and into the clearance box, which thus allows them to impart a greater lateral motion to the pressing blocks than would be the case were the clearance box not employed; it may, however, in some cases be dispensed with when no great lateral motion is required. The ends of the tension bars are by preference made detachable from the hydraulic press for introducing the wedges consecutively. When the apparatus is worked by hydraulic power they prefer to construct the hydraulic press with the force-pump formed in one therewith or fixed directly thereto, and it may be constructed either with a closed receptacle containing the requisite charge of water for working it, or the water may be supplied through a suction pipe from a separate reservoir. This arrangement of apparatus may also be employed in some cases with effect with one wedge only, as by forming the pressing blocks parallel—that is, without inclined surfaces corresponding to those of the wedge, as heretofore proposed—they are enabled to obtain an expansion equal to the entire thickness of the wedge, instead of equal only to a small portion thereof, as would otherwise be the case.

The advantages claimed for the improved apparatus, in addition to the absence of the noxious vapors in the mine and the danger resulting from the use of blasting powder are—first, a great saving in the time employed in effecting the breaking down of the coal or other material, owing to the almost unlimited power which is available by their system, enabling them to break down at one operation far greater masses than can be effected by blasting; and, secondly, the avoidance of the great deterioration of the coal or other mineral which takes place when blasting powder is used, owing to the large quantities of small fragments or "slack" which are produced thereby.

In the annexed diagrams, Fig. 1 shows a part sectional side elevation of the apparatus; Fig. 2 shows a plan of the same; and Figs. 3 to 8 show details to an enlarged scale. Similar letters of reference indicate similar parts in each of the figures. A A are the tension bars of wrought iron, steel, or other metal capable of withstanding considerable tensional strain. These bars may either be formed of one piece bent round at *a* so as to form a loop, or they may be two separate bars connected together at *a*. These bars are inserted into a hole cut in the coal or other mineral, B, to be broken down in the manner shown, the ends thereof, which project beyond the face of the mineral, being widened out for the reception of the cylinder, D, of the hydraulic press between them, to which they are connected by T-heads formed at their extremities, being made to catch against lugs, *c c*, on a collar, C, secured to the cylinder. Before the tension bars are placed in the hole a clearance box, E, is first placed between them at the extreme end of the loop, after which the two pressing blocks, F F, are inserted, the sectional form of which blocks is shown more clearly at the enlarged section of Fig. 3; lastly, the two wedges, or the double or split wedge, G G, shown enlarged at Fig. 6, are introduced between the bars, A A, so that their points just enter the small interstice between the pressing blocks. The parts A, E, F, and G thus put together are then inserted into the hole in the material, B, and the hydraulic press, D, is connected to the bars, A A, as above described. The press, D, has a plunger, *d* d^1, the front part, d^1, of which projects between the tension bars, A A, as shown, and is formed either as shown in enlarged cross section at Fig. 4, or as at Fig. 5. To the back end of the press, D, is fixed the pump, H, worked by means of the handle, L, and inclosed in the reservoir, I, containing the water required for working the press.

The press being put in action the plunger forces the double wedge G forward between the pressing blocks, F, thereby forcing these asunder in an angular direction, and, consequently, causing them to exert a powerful bursting strain upon the sides of the hole. By forming the inner surfaces of the pressing blocks inclined, corresponding more or less with the taper of the wedge, this first expansion of the blocks may be effected in a more or less parallel direction instead of angular. The object of the clearance box is to allow of the points of the wedges being driven past the inner ends of the pressing blocks, so as to effect an increased expansion of these ends; where this is not required the clearance box may be dispensed with. The double wedge, G, having been driven into the required extent, the press is detached from the tension bars, A A, which is effected by first opening a passage of communication between the reservoir, I, and cylinder, D, by means of the screw, J, so as to allow the water to flow from the latter back into the former, after which the press is pushed forward slightly, so as to release the T-heads of the tension bars from the lugs, *c*, whereupon the tension bars are sprung open and the press removed. Another wedge, G^1, shown enlarged at Fig. 7, is now placed between the tension-bars, A A, so that its point fits into the space, *g* (Fig. 6), formed between the two parts of the double wedge, G. To facilitate the correct insertion of the wedge, for this purpose a handle, K (Fig. 8) is screwed into the rear end thereof, which is removed when the wedge is in position. The press is then again attached to the tension bars, and the wedge, G^1, is forced in between the two parts of the double wedge, thereby effecting a still greater expansion of the pressing blocks; and in like manner one or more other wedges may be consecutively forced in, as indicated at Figure 2, until the accumulated pressure thus produced is sufficient to break down the mass of coal or other material operated upon.

The invention can also be modified so as to employ screw instead of hydraulic power. The arrangement of the tension bars and pressing blocks is similar to that used with hydraulic power; but the hydraulic press is replaced by a frame wherein is a slot with a worm wheel in it, fitting with a female screw thread upon a screw spindle formed with flat upper and lower surfaces, and passing through correspondingly-formed holes in the bosses of the frame, so that it can move through but cannot turn in the latter. In gear with the wormwheel is the worm, the spindle of which is carried by brackets on the frame, the ends of the spindle being formed to receive a ratchet lever for rotating the same. The ends of the tension-bars are formed with lugs, which catch behind keys bearing against other lugs formed on the frame, so that the frame is by this means connected to and disconnected from the frame by merely inserting the keys, and without having to spring open the tension bars. As the projecting ends of the tension bar may thus be made considerably shorter than in the previously-described arrangement, this mode of connecting the tension bars might with advantage be employed in that case also. By rotating the worm wheel by means of the worm the screw spindle is advanced, and is caused to force the wedge between the pressing blocks, as in the hydraulic arrangement.

Messrs. Jones and Bidder do not limit themselves to the precise details described, as these may, of course, be variously modified without departing from the nature of the invention. Thus, for instance, where only one wedge requires to be driven in, the arrangement may be reversed—that is, the wedge may be placed at the inner end of the tension bars, with its point facing the pressing blocks situated at the front end, and which are then forced in by the press so as to cause the wedge to enter between them, or the wedge might, in that case, be drawn forward by the press against the pressing blocks; but what they specially claim is—first, the construction and employment of apparatus for breaking down coal, slate, stone, and other minerals, wherein two or more wedges are caused to be driven consecutively by hydraulic or screw power between the surfaces of the material to be broken down, in such manner that the pressure exerted at one and the same point can thereby be increased at will; and, secondly, the arrangement of tension bars connected in a readily detachable manner to an hydraulic press or frame carrying a screw spindle, operating in combination with pressing blocks and one or more wedges.

Singular Case of Poisoning by a Fly.

We learn from the Troy *Press* that Captain Green, of that city, Deputy Inspector of Boilers and Assistant Engineer of the Fire Department, about a fortnight since (August 25), was bitten by a common horse fly, which had been feeding on carrion, and had communicated the poison. The wound was on his right hand, between the thumb and index finger, and he soon experienced considerable pain, which gradually increased. The bite was at first supposed to be from a mosquito, and treated accordingly by a druggist, and afterwards by a physician. The pain and swelling continued to increase, and erysipelas setting in, a surgeon was consulted and pronounced it a bite by a fly. Medical treatment has succeeded in placing Mr. Green out of danger, but it will be a long time before he can recover the use of his arm.

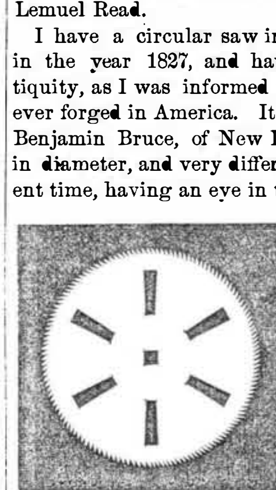
Correspondence.

The Editors are not responsible for the Opinions expressed by their Correspondents.

The Oldest Circular Saw.

MESSRS. EDITORS:—I noticed in your valuable paper of September 11th an article entitled, "First Circular Saw," by Lemuel Read.

I have a circular saw in my possession which I obtained in the year 1827, and have kept it on account of its antiquity, as I was informed that it was the first circular saw ever forged in America. It was made in the year 1792 by Benjamin Bruce, of New Lebanon, N. Y. It is 12½ inches in diameter, and very different from saws in use at the present time, having an eye in the center 1⅝ inch square and six slots in the plate to keep the saw from heating when at work, thus the teeth are three to one inch, and filed about the same angle as a common hand saw. I am informed by an aged person, now living, that he came here in the year 1806, and there was at that time a circular saw in use for edging boards and sawing rims for spinning wheels, and had been in operation 3 or 4 years.



The idea of a circular saw for cutting boards was taken from a small saw first made of tin and used in a turning lathe by Amos Jewett, of New Lebanon, N. Y., a clock-maker; and he made use of it in cutting the teeth of wheels, which were V-shaped, for his clocks. I have conversed with him in my younger days upon the subject, but never ascertained the time to date his first experiment with circular saws. We have a large building standing in our village of which the covering and floors were edged and matched with circular saws in the year 1815 or 1816. So I think friend Read is not at the top in antiquity. GEO. M. WICKERSHAM.

Shaker Village, New Lebanon, N. Y.

[We remember to have seen and examined the Bruce saw a few years ago, when visiting the Shakers at New Lebanon. Friend Wickersham then called our attention to it as being probably the oldest circular saw in the country. If any of our readers can refer to one of earlier date we hope they will write us the particulars.—EDS.

Curious Antique Astronomical Watch.

MESSRS EDITORS:—The very interesting account in your paper of 21st August of the great astronomical clock of the Beauvais Cathedral, and also of the Strasbourg Cathedral clock, reminds me of an astronomical watch that I often delight to look at, which is no less remarkable in its way. A short review of its performances may interest your thousands of readers, as it is a curiosity of science and mechanism.

It is not one of those mere mechanical toys contrived to amuse the monarchs and other grown-up children of luxury of a century or two back, which, besides keeping incorrect time, when running at all, could be made (by touching certain springs or otherwise) to strike a bell or play a few bars of music, or display soldiers moving past a window in its face. On the contrary, this elegant watch, made in the highest finish and good taste, and without a tawdry ornament, is a perfectly reliable time-piece. It performs all its movements with the most accurate punctuality, showing the exact time of day, the hour, minute, and second, the month, the day of the month and of the week, the age of the moon, the moon's phases, the zodiacal and planetary phenomena of the present time, etc.

In outward appearance, it is a plain gold watch, with two enameled faces protected by crystals. Each face, with its own features, will be described separately. Its size is two and three eighths inches in diameter and about five eighths of an inch in thickness.

The principal face exhibits three dials, two smaller ones occupying opposite positions in the upper and lower halves of the greater dial. Above this face on the rim of the case, is the legend, in Roman capitals, "INCERTA EST HORA, AETERNA RESPICE," which may be rendered, *The hour is uncertain—look at things eternal.*

The outside edge of this face contains a circle divided into seconds, and traversed by an independent second hand once in every minute; while balanced on the same central point is another similar delicate hand which makes its circuit only once in two years! one end pointing to the months, the other to the twelve signs of the zodiac corresponding with each month in the year. The figures representing these signs are most exquisitely done in miniature, in black on the fine white enamel face, as is also the lettering of the names, in French, of the months.

The divisions and subdivisions of this and every other dial are spaced with geometrical precision, and the works perform their part so accurately that the point of each one of the twelve hands of this watch arrives at the proper instant exactly on or over its marked position, a proof of the superiority of the workmanship.

The upper small dial on this face has three hands pointing severally to the day of the month and the days of the week, in French, and their corresponding celestial bodies in the following order: The sun, the moon; the planets Mars, Mercury, Jupiter, Venus, and Saturn. The lower small dial on this face shows the hours and minutes in the usual manner of watches. Below this face, on the rim of the case, is the inscription, *Tempus rerum imperator*—"Time, the ruler of all things."

The opposite face of this superb watch presents the same general arrangement of three dials, but the larger dial is also divided into equal upper and lower parts, the latter