

A TRACTILE POWER ECONOMIZER.

It is well known that any effort of traction applied to a rigid non-flexible object is much more arduous than if applied to an elastic body. Thus a carriage hung on springs is easier to draw than one not so suspended, yet of like weight. Herr Schermann, a German engineer, has lately invented an apparatus which he applies, to the collar of a horse, for example, on each side and attaches to it the traces. It consists of an iron cylinder filled with disks of rubber alternating with disks of sheet iron. Through the whole passes a rod having a hook at each extremity of the apparatus. When strain is brought on either end of the rod, the rubber is compressed, and hence the device serves as an elastic medium to pull against. The inventor has made experiments which are said to show an economy in fatigue and tractile power of 17 per cent during travel and of 20 per cent in starting the load.

[The foregoing, translated from *Les Mondes*, offers another instance of an American invention advertised abroad as the production of some foreign scientist. The same device was patented here, January 18, 1876, by Mr. August J. Peters. Its construction will be clear from the annexed engraving, in which C is the elongated end of the trace hook, entering the cylinder which contains alternate disks of rubber and metal, as already described. B is the link whereby the device is connected to the trace chain. If the invention is so economical of power as above intimated, it is worth examination by street car owners and others using horses for severe work.—Eds.]

IMPROVED SAFETY VALVES.

We annex engravings of a safety valve designed and patented by Mr. J. W. Melling, of Birkett Bank, Wigan, England, the special feature of this valve being the arrangement adopted to secure a large discharge area. This increase of discharge area as compared with ordinary valves is due partly to the increase of lift and partly to there being two openings through which the escape of steam can take place. The increased rise is obtained by providing a larger area for the steam to act on when the valve is blowing off than when it is closed. This will be seen on reference to the sections Figs. 1 and 2. When blowing off, the steam that passes the inner face, B, acts with effect on the additional surface provided by the part, C, on the valve. The width of the space left between this part, C, and the top of the boss on the seat determines what amount of increase in pressure the valve will allow before rising to its full height; for instance, if a valve was loaded to commence blowing at 60 lbs., it would act something like an ordinary valve until the pressure reached, say 62 lbs., when it would rise at once to its full height; but if the escape was made wide it would allow the pressure to rise to 63 lbs. or 64 lbs. before going to its full height, which is, when loaded by dead weight, about equal to the width of the orifice in the seat, so that the area given for discharge is as much as is required by that orifice. In addition to the outer discharge, there is the inner one that is equal to from 30 to 40 per cent of the outer one, and the combined areas amount to six or eight times as much as would be given by the ordinary kind of valve of the same outer diameter, when working with pressures over 50 lbs. per square inch.

It will be seen that the discharge from the outer face is uninterrupted, whilst the inner discharge gives these valves an additional advantage when used as reducing valves, where the difference required in the pressures is small. Mr. Melling's valves also overcome the objection to spring loading, as the increasing resistance of the spring is compensated for by the additional area that is provided for the steam to act upon. These valves also differ from the ordinary safety valves, as the lift is as great with high as with low pressures of steam.

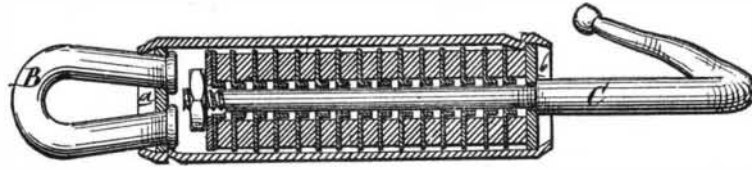
The lift of the valve shown in Fig. 1, when loaded by dead weight, is self-regulating, as the steam lifting the valve has first to pass through the orifice in the seat, but with Fig. 2 the lift has to be limited. These valves may be so proportioned as to give a large discharging area with a smaller loaded or lifting area, which makes them specially valuable when used as combined low water and high pressure valves.

Fig. 3 shows the simplest and most direct mode of loading for stationary boilers, the weights being carried by the crossbar or stirrup, the socket of which fits loosely on the end of the valve spindle.

Fig. 4 is a representation of a spring-loaded valve in which the spring fits round the body of the seat, and at the top is held at each side by the hooked ends of the crossbar or stirrup, which rests on the valve; at the bottom it is held by the projections on the collars that fit round the screw studs by which the tension is regulated. The easing lever bears against

two shoulders on the stirrup, and is so mounted that it cannot prevent the valve from rising.

For marine purposes Mr. Melling adopts an arrangement in which a pair of valves are mounted on the same branch seating. The valves are loaded by means of the two springs, one at each end of the crossbar, and the tension of the springs is regulated by means of nuts on the screw studs at the bottom, or in place of the springs two ordinary spring balances are used; in either case the springs are out of the direct current of the escaping steam. The valves when locked up are eased from their faces by the double lever and double cam. We are informed that a number of these valves are now in



PETERS' POWER ECONOMIZER.

use, and several very favorable reports of their performances have been received. The need of such appliances is large, and is daily increasing.—*Engineering.*

The Latest Advertising Dodge.

This time it is a thoughtful financier in Vienna, who has invented an ingenious method of attracting people's attention to his lottery scheme. He watches the English newspapers, in which it is customary to print "births" with the usual notices of "deaths" and "marriages," and carefully registers the address of each happy mother. In due time the parent receives a letter (photo-lithographed) worded thus: "Dear Madam: Having read in the — the happy event which lately took place in your family, I beg (although a perfect stranger to you) to congratulate you with all my heart, and to add my wishes that the little offspring may become a source of great pleasure and comfort to the parents. * * It has been for many years the custom on the Continent to endow the little helpless child who enters this world with a fair chance of life in a pecuniary sense of the word. It is almost the universal practice to lay aside for the baby an interest-bearing first-rate Government bond, which also stands the chance of obtaining a large premium prize of thousands

This useful invention costs only a few cents; and when once used, it becomes a household necessity.

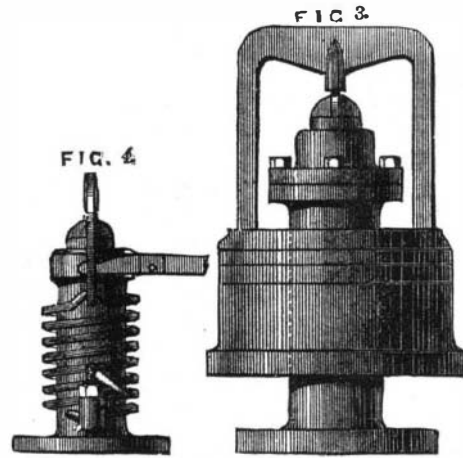
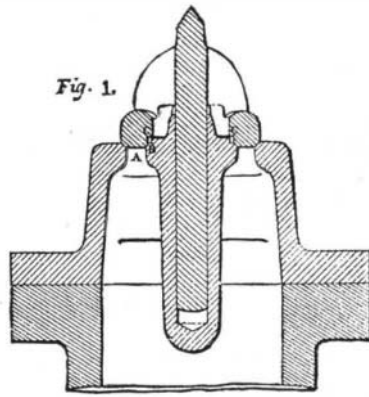
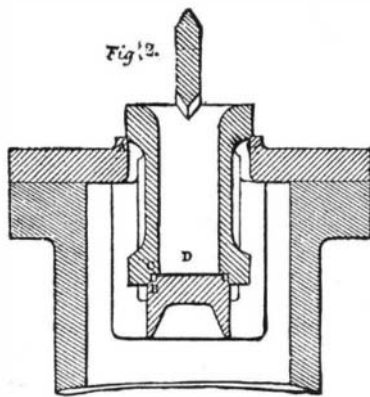
Persian Petroleum.

Mr. Churchill, an English consul, states that for hundreds of years naphtha has been extracted by the natives from the pits at Baku, Persia, and the quantity underground appears to be unlimited. At the present moment a well eighty-one feet deep is shown that was dug by the Persians when they were masters of the country 200 years ago. In summer, when gases are generated in the bowels of the earth, the naphtha is thrown up in jets, some reaching 100 feet in height above the soil; it then runs to waste, as no means have as yet been devised to collect such large quantities of this oil. While at Baku Mr. Churchill visited the wells situated on the plateau of Balakhana. Strings of high-wheeled carts were met going to and coming from the wells, conveying in raw skins naphtha to the town. The first well we visited, says the writer, was an artesian well 126 feet deep. It was bored three years ago, and last year rendered from 16,000 to 20,000 poods of naphtha a day. At

present, the demand having decreased, it only gives about 5,000 poods (a pood is 36 lbs. in weight). A horse was employed in raising the oil by means of a pump. Each time this pump was set to work a jet of naphtha seven or eight feet high and one foot in diameter came gushing out, and kept on coming for some time. We next visited the well that was sunk by the Persians 200 years ago. With a looking glass to throw a sunbeam down it, the naphtha is seen working away at the bottom, some eighty feet below the surface, like a troubled sea.

In the close neighborhood of these two wells has been formed a lake of pure naphtha, fully a quarter of a mile in circumference and twelve feet deep. It is calculated to hold millions of poods of naphtha that has run to waste, and has now become worthless. In the year 1874 upwards of 180 manufactories were at work in the outskirts of Baku; but owing to the enormous competition of American petroleum, many of the smaller manufactories have been compelled to shut up.

The two largest manufactories are those of Mr. Mirzayoff and Messrs. Kokoroff & Co., at Surakh Khana, a spot situated five miles from Balakhana, and eight miles and a half from the town. This spot was chosen on account of the economy of fuel, as gas issuing out of the surface is used in lieu of coal or naphtha. There is at Surakh Khana the wonderful sight of green fields with waving corn, in the midst of which the removal of a foot or two of earth will reveal a jet of gas that will raise an enormous blaze if set on fire. It is here that the Hindu monastery of fire worshippers is established, where a tongue of flame is perpetually kept up. But if these establishments have the



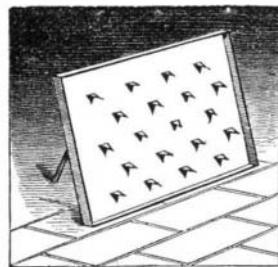
MELLING'S IMPROVEMENTS IN SAFETY VALVES.

of pounds." Then the financier encloses prospectus of the — loan of the year 1870, descants on the opportunity of the young one's winning £10,000, and thoughtfully adds a blank application for the mother to fill out, which last she is requested to please "return together with the needful cash."

A somewhat similar advantage of family increase was once taken by an enterprising porter brewer of London, who advertised porter for nursing women. New mothers invariably received circulars and full information concerning the beverage.

A Woman's Invention.

All lovers of good toast will be interested in the following useful bread toaster, the invention of Mrs. A. C. Harris, of Granville county, N. C. It is not patented, and can be made by all who wish to use it. It is made by taking a piece of sheet iron or heavy tin, about 18 inches square, and turning



up the edges so as to form a shallow tray, to give sufficient stiffness to the sheet. A number of V-shaped openings are now made in regular order across the bottom; and the tongues of the V's are turned up at right angles to the sheet. These sharp points are to hold slices of bread pressed upon them. A short piece of stout wire hinged to the back serves as a prop to hold it at any angle to the fire. After placing the slices of bread in position, by pressing them on the points, the toaster is set up on the hearth before an open fire, where the bread soon assumes a rich brown color, and then the slices should be reversed. If the lower part should brown before the upper, the toaster can be turned upside down, and so bring the underdone bread nearest the fire.

advantage of cheap fuel, the position of Surakh Khana, away from the naphtha wells and at a distance from the town, increases the cost of transport, and consequently adds to the cost of the article produced. The buildings, moreover, erected by Mr. Mirzayoff are too palatial for practical purposes. There may be said to be four distinct operations in the development of this trade: 1st, the extraction of the naphtha from the earth; 2d, its conveyance to the refining manufactories; 3d, its refining processes; and 4th, its transport and its disposal in the markets of Russia.

The quantity of naphtha extracted at the wells is regulated by the demand, as there seems to be an unlimited supply of the raw material. Forty wells produced in 1874 upwards of 4,000,000 poods, besides the quantity that ran to waste. The means employed in the extraction are in some cases most primitive and clumsy, and it is only within the last three or four years that the process of boring has been resorted to, and wells are even now dug in the ordinary fashion at great expense. Then, again, while fuel exists in abundance on the spot, few steam engines are used, and those which are employed are not of the best. A recent visitor did not see a single centrifugal pump in use. After that the carting of the naphtha is both clumsy and expensive. The carts are not calculated to carry more than twenty-five or thirty poods each, and they require a horse and a conductor for every one separately. There is a vast field for economy in this, if in nothing else, and various plans have been suggested for the transport of the raw material to the manufactories; someone for the establishment of a tramway, others of a railway with suitable tanks to hold the oil, while a third party insists upon the laying down of an iron pipe through which the naphtha would, by gravitation, find its own way to the lower level of the town. These two last methods are used successfully in Pennsylvania for much longer distances, and it is only by the use of such plans that the Baku petroleum can possibly compete with the petroleum of the United States.