Inventions Give Employment to More than they Throw out.

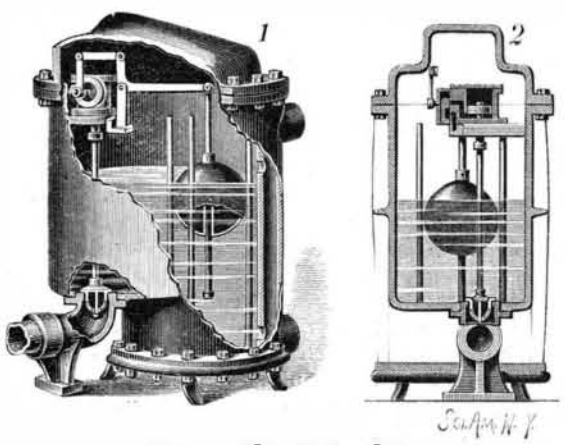
Frequently one sees appalling computations of the vast number of workmen who are constantly thrown out of employment by new mechanical inventions that take the place of human hands. But along with the displacement of hand labor there has gone a replacement, in consequence of the increased production that always follows a cheaper process of manufacture. Especially is this observable in all artistic matters. Pictures that are now produced and given away as advertisements could not be bought except by the well-to-do people a century ago. Art has been applied to a thousand articles of daily use, and artistic forms thus perpetuated have come to the homes even of the poor. Cheaper processes of engraving are now in use; but instead of causing the employment of fewer artists this requires the services of more and better artists, and they are paid now more than they ever were. A new class of artists have sprung into existence. They are known as pen and ink draughtsmen, and it is they who have made the illustrated newspapers of to-day far superior to those of even a quarter of a century ago. They command a salary of from $5,000 to $15,000 a year.

But it is not alone in picture making that the progress of invention gives new employment for artists. There is an immensely wide field for designers in wall papers, carpets, all sorts of textile fabrics, silverware, furniture, and hundreds of other departments. There are armies of artists engaged in making patterns and designs that were never needed in the world until new processes of duplication created an almost insatiable demand for variety.

Other fields of employment have also been opened in the present generation for vast numbers of workmen. In the construction of electrical apparatus, of watches, of machinery and tools, and the thousand and one products of invention, there is room for the laborer. There are more women employed even at sewing, and at better wages than ever for the skilled. The typewriting machine has already its army of wage earners. The discovery of crude oil has put legions at work, and, looking at the whole subject, it must be admitted that though mechanical inventions have put a great many persons out of work, they have also put a great many persons into work, besides producing for the multitude an endless variety of beautiful and useful as well as cheap products.—*Baldwin's Textile Designer.*

AN IMPROVED DRAINAGE-TRAP.

The accompanying illustration represents a drainage-trap for automatically discharging the water of condensation whenever a certain quantity has accumulated, Fig. 2 being a transverse sectional view. It has been patented by Mr. John Shaw, Sr., of Bayonne, N. J. In one side of the casing is a channel connected at its upper end with an inlet pipe leading to the steam supply, this channel being connected with the interior of the casing by apertures near the top and bottom, and there being opposite the bottom aperture a blow-off pipe with suitable valve, by means of which the casing may be cleaned of sediment. A short distance above the bottom of the casing is an offset, in which opens a water outlet pipe having a valve opening inward, the valve being on the lower end of a piston rod moving vertically in a cylinder supported on a bracket in the upper part of the casing. On this cylinder is formed a valve chest, the valve opening and closing ports leading to the top and bottom of the cylinder, and also controlling an outlet port through the bracket. The valve stem carries an arm pivotally connected bya link with the short arm of a bell-crank lever fulcrumed on the bracket, and pivotally connected with a rod pro-

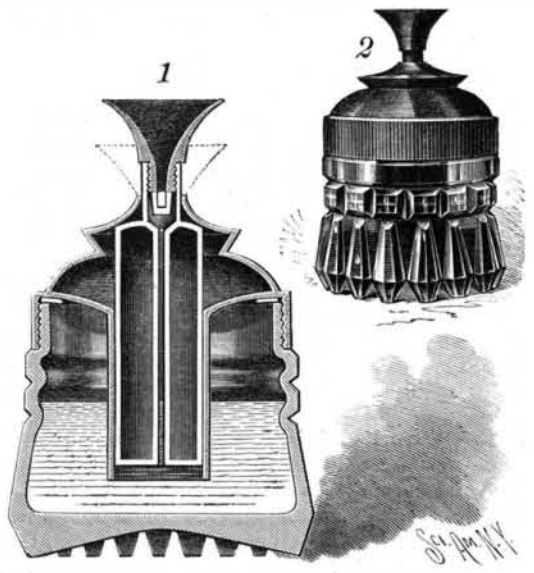


SHAW'S DRAINAGE-TRAP.

vided with collars between which travels a float, guided in vertical guide rods. As steam passes to the interior of the casing, the water of condensation finally closes the bottom opening from the side channel, and the float rises until it presses against the top collar on the vertical rod. As this rod is moved upward by the further accumulation of water, the bell-crank lever is turned to operate the valve and admit steam into the bottom of the cylinder, lifting the piston and opening the valve in the water outlet pipe. The sinking of the float as the water goes out, pushing on the lower collar of the vertical rod, swings the bell-crank lever to uncover the upper inlet port of the valve, whereby steam is admitted to the top of the cylinder, forcing the piston downward and again seating the valve in the water outlet pipe. The valve seat of the water outlet pipe is located somewhat above the bottom of the casing, to prevent sediment passing into the pipe.

AN IMPROVED INKSTAND.

An inkstand designed to almost altogether prevent the evaporation of ink is shown herewith. It has been patented by Mr. Emry Davis, of Kane, Pa. The inkstand is closed air-tight by a cover, formed of an inner



DAVIS' INKSTAND.

annular concaved disk of soft rubber and an outer ornamental metal cover, flanged and threaded to the stand. In the cover is fitted a tube reaching nearly to the bottom of the ink well, the tube having a flange fitting closely the central opening of the rubber disk, and making an air-tight connection between the tube and cover. In the tube is placed a float, in which is placed a funnel or dip tube which reaches up through the annular cover, the lower end of the tube being open at the bottom to receive the ink. If desired, a light coiled spring may be used at the bottom of the float to lift it suddenly in the tube. In use, the float is held up by the buoyancy of the ink, as shown in full lines in Fig. 1. To fill the pen with ink, it is placed in the upper end of the dip tube and pressed down, as shown in dotted lines. The pressure lowers the float, and the air confined above the surface of the ink causes the ink to rise in the dip tube and fill the pen. On removing the pen, the float rises and the ink recedes in the dip tube, so that there can be practically no evaporation.

Electric Welding.

It was at a meeting of the Boston Society of Arts in the fall of 1886, where Prof. Elihu Thomson, the inventor of electric welding, first explained and illustrated by practical experiments the art of electrical welding, discovered by him, to a large and interested audience who could scarcely believe their eyes when they saw copper and iron rods one-half inch in diameter welded in a few seconds, together with other equally startling experiments.

Professor Thomson, like every great and original inventor, was impressed by the discovery which he had made, and eagerly followed up his experiments, conscious that he had solved the problem of how to spare human strength a large share of the extravagant waste expended to meet the requirements of an increasingly exacting and fastidious civilization. By careful study and patient perseverance, supplemented by elaborate facilities for experimenting, rapid and striking improvements were made in the mechanical and electrical apparatus employed in the art, until now, when the process may be, in a sense, considered perfected, or at any rate rendered in every way fit to be placed on the market as a great labor-saving device, and a method by means of which results in metallurgical art and science can be achieved which were utterly impossible until now.

It was to see these devices in practical operation that representatives of the scientific and daily press, numbering about 50, in response to the thoughtful invitation of General Manager H. A. Royce, of the Thomson Electric Welding Company, were recently given a reception, at the Malden, Mass., Electric Light Company's station, where three transformers, a 30-unit welding dynamo, and specimens of work in riveting, shaping, and welding were shown.

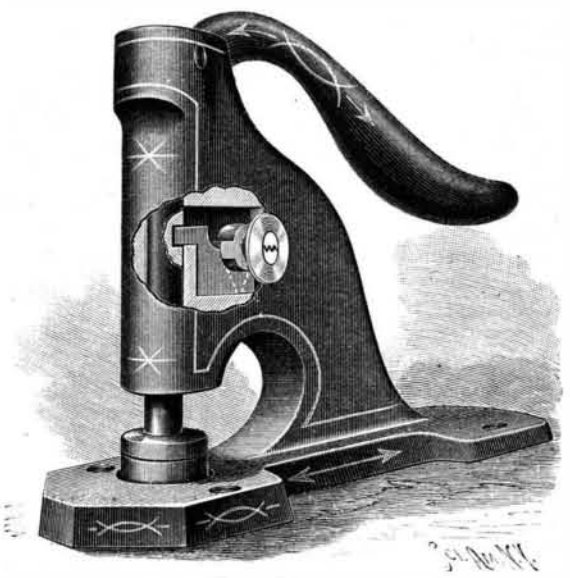
The proceedings were in charge of Manager H. A. Royce and several able assistants, well known electrical engineers. Together, these gentlemen manipulated the entire machinery and superintended the experiments, answering a multitude of questions and explaining in the fullest possible way, but in plain and unpretentious language, the entire process to the eager crowd of wondering, curious, and dazed visitors, who, almost to a man, found difficulty in expressing their astonishment, as they bewilderingly stood and watched the process of welding going on in almost every conceivable form, and between many different metals, including joints in lead, brass, and iron pipe, and quite a number of other forms of materials. The apparatus exhibited was of the indirect type, the welding being done on a transformer or "welding coil," receiving current from a dynamo. For small work the company manufactures a direct welding machine, in which the transformer is dispensed with and the current taken direct from the armature to the clamps attached to the field magnet of the dynamo. One-half inch bars of copper and iron rods from ½ to 2 inches in diameter were repeatedly welded on the three transformers, all of which were used in order to show the ease with which various types of machines can be adapted to all classes of work. The smallest transformer, weighing 500 lb., was used in welding ⅝ copper, which is four times the size of the largest overhead conductor employed for electric railways. The strength of the joint was evidently greater than that of the rest of the rod, for, on twisting, it was broken at some distance from the weld. By a still larger transformer the method of butt welding extra heavy 2 inch iron pipes was shown. An absolutely tight joint obtained in this way is of great value in the manufacture of ammonia machines. The third transformer, welding 2 inch solid iron in less than two minutes, gives a current of over thirty thousand amperes and consumes about fifty horse power. The rapidity, ease, and certainty with which the work was done, the strength and good appearance of the welds, excited the admiration of all.

Blasting Holes to Plant Trees.

"Few people elsewhere in the world may ever have heard of blasting holes to plant shade or fruit trees," said a cultivator the other day, "yet the practice is common here and shows good results. In most places there is found sufficient top soil for any purpose, but as land has become valuable, people have cast about for means to utilize lands where the coarse sand rock comes too near the surface for successful tree planting. A blast, well put in, creates a pocket for broken rock mixed with top soil, which furnishes a basin to hold moisture as well as a deeper and cooler hold for the roots. It is yet too early to say what will be the ultimate results of such planting, but in a climate like ours, where a superfluity of rainfall is not likely to occur, it will no doubt be successful."—*San Diego, Cal., Union.*

AN IMPROVED SEAL-PRESS.

A seal-press or hand-stamp, so constructed as to prevent its use by unauthorized persons, is shown in the accompanying illustration. It has been patented by Mr. John G. Strodtmann, of Petersburg, Ill. The plunger is forced downward by a cam lever, a spring lifting the plunger when the pressure is removed. A lock is embedded in the standard so that its bolt will engage a notch or shoulder upon the plunger, the notch being so located upon the plunger that, to engage with the bolt of the lock, the plunger must be in its lower position, in contact with the die, as shown in the illustration, whereby the faces of the dies are made inaccessible when the press is locked. The notch of the plunger and the lock-bolt are also concealed and protected



STRODTMANN'S SEAL-PRESS.

within the press frame, the frame of the press being preferably made in two parts, divided in a central vertical plane, and permanently riveted together, the lock being held in an interiorly recessed portion, while the rivets uniting the parts are finished flush with the surface, and the frame thereafter japanned or otherwise finished in such manner as to conceal the position of the rivets. The lock may be a multitubular one which cannot be easily picked, and presents its keyhole and the end of the tumbler barrel only to view, flush with the side face of the frame.