

**Dividing Profits with His Workmen.**

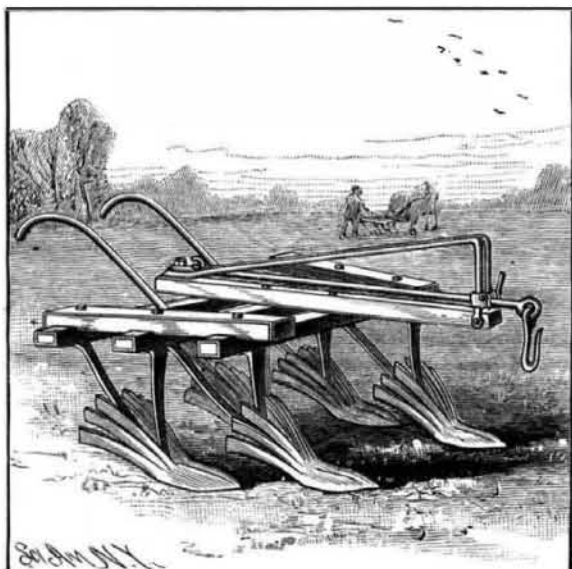
At the French Association for the Advancement of Science an interesting account has been given of the successful application of the system of admitting workmen to a share of profits in the large cotton printing establishments of M. Besselievre, near Rouen. The *Pall Mall Gazette*, referring to the subject, states that M. Besselievre does not, indeed, give his hands a share in the management and risks of his business. He keeps his books to himself, and pays them the wages ruling in the district, like ordinary laborers. But in addition to their wages he has since 1877 distributed among all the workmen who have been in his service for five years an annual bonus proportionate to his own profits, which has amounted on the average to 12 and in one instance reached 17 per cent of the wages earned by them during the year. Half of this bonus is paid to the men in cash, and half is retained to form a sick and pension fund and to provide for the family of the workman in the case of his death. This money is invested in the business at the rate of four per cent, but it is not confiscated if the workman is dismissed. To give the best of guarantees against capricious dismissal, moreover, the right to discharge a workman has been ceded by M. Besselievre to a committee, of which the majority consists of persons engaged in the factory. M. Besselievre has disbursed 80,000 francs in the last six years in these extra payments to his workmen, but considers himself to have been commercially the gainer by his liberality, owing to their increased devotion to their work and attachment to their employer. The success of such experiments wherever they have been tried ought to encourage more frequent imitation.

**Enterprise in Dakota.**

The following good story, which illustrates the rapidity with which towns are built up in new Territories, was told the *Northwestern Lumberman* by a gentleman who was looking around in Dakota recently. He was present when officials of the Chicago, Milwaukee & St. Paul road arrived at a point thirty miles north of Mitchell and planted a town which they called Woonsocket. At the time only one farm house was standing in the vicinity, and a car was used as a depot. This was on Thursday, and on Saturday of the same week there were twenty shanties, a livery stable, two stores, a saloon, a hotel, and three lumber yards. There are men who have loaded lumber on cars without knowing where it would be unloaded, and then run it to the first new town they hear of being started. But it is not best to imagine that all of the yards which are established so suddenly in the new Dakota towns have complete assortments or are models of neatness. A few hundred feet of lumber thrown down by the track constitutes a yard, which grows and is put into shape as the town progresses.

**CULTIVATOR.**

The plows, in the cultivator herewith illustrated, are made with angular forward parts, and have their rear parts cut into strips bent into the form of mould boards and twisted through a quarter of a turn, so that the soil may sift through while the weeds will fall to the ground from the rear ends of the strips. Each plow is connected to the frame by two standards of unequal length, so that they are firmly supported against the draught strain. The frame is formed of three cross beams connected near their ends by two side beams, and at the center by a beam projecting in front to serve as the draw beam, and to its forward end are secured two parallel rods, which extend nearly vertically upward for a suitable distance, when they are bent to the rearward and secured to that end of the beam. The draw rod passes

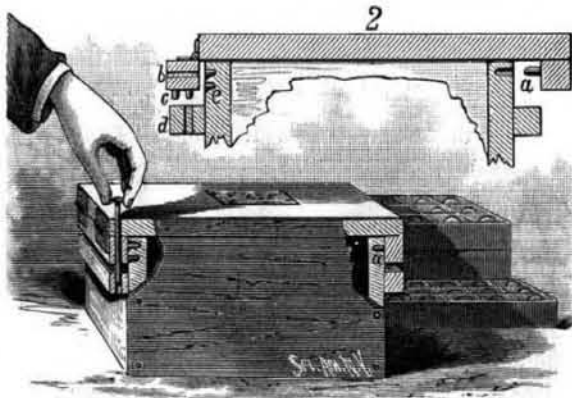
**PLATTEN'S IMPROVED CULTIVATOR.**

forward between the parallel or guide rods, and its forward end is provided with a hook for the attachment of the draught. The draw rod passes through a clamp, by which it can be held at any point on the upright parts of the guide rods, thus regulating the depth to which the plow works. The forward parts of the plows are made angular and nearly flat, and run beneath the surface, cutting off the roots of the weeds.

This invention has been patented by Mr. John Platten, Sr., of Fort Howard, Wis.

**BOX FASTENER.**

The object of an invention recently patented by Mr. James R. Morrison, of Oakdale, Ill., is to provide a fastening for the covers of egg cases or other boxes, whereby the cover can be held firmly on the box and can be removed easily and rapidly. One end of the box cover is provided with a fixed cleat having one or more dowels, *a*, and the opposite end has a hinged cleat, *b*, also furnished with dowels. The dowels in the fixed cleat are passed into holes in one end of the box, and those on the hinged cleat into holes, *e*,

**MORRISON'S BOX FASTENER.**

in the other end of the box. The hinged cleat is then locked in place by a pin or bolt, which is passed through the cover, the hinged cleat, and a fixed cleat on the end of the box, as shown in the perspective view. Fig. 2 is a section through the cleats and box.

**BARREL PUMP.**

The device is attached to the barrel by means of a bung tube, *d*, within the upper end of which fits a short tube, *a*, through which passes the pump tube, *e*, provided at its lower end with sharp points, *f*, that are to be embedded into

**GUIGNON'S BARREL PUMP.**

the barrel for staying the bottom of the pump tube and steadying the device while pumping. The pump and plunger are of the ordinary construction. The bottom of the tray, *h*, is made conical, so that the drain will be from center to circumference. Near the edge of the tray the bottom is provided with a short tube, *a*, through which the drip finds its way from the tray back into the barrel, thereby avoiding the use of a separate drip pipe. The detachable brace, *f*, is formed at one end with a sleeve, *c*, that fits upon the bung tube, and at the other end with a crosspiece that fits in the channel formed upon the bottom of the tray, serving to support the tray and prevent vibration. A guard with radiating arms is placed in the tray to prevent articles from falling upon the bottom. The vessels to be filled stand upon this guard. The pump is simple in construction, and is firm and steady while being operated.

This invention has been recently patented by Messrs. L. E. and E. E. Guignon, of Corry, Penn.

**Conscience in Boiler Making.**

We are sometimes very much annoyed by the want of good faith in boiler construction. There seems to be a feeling, certainly on the part of some, that a little departure from the correct thing is of little account if it will only pass. One of the tricks is to use thinner iron for the construction of the shell in places where the lap of the sheet is inside. For instance, if a boiler shell is constructed of three sheets in length, the outer sheets will overlap the center sheet and prevent the edges being seen unless one gets into the boiler. Now it is not unfrequently the case that this center sheet is of thinner iron than the other sheets. An inspector discovers this when making the internal examination.

In casting up the safe working pressure of a boiler, the strength of the weakest point must be the highest limit allowed for bursting pressure, and the factor of safety must simply reduce the pressure which would burst the boiler to a safe working pressure. Now the thinner the iron the less resistance it affords, and if the thin sheet is the weakest point, it must be made the basis for calculating the safe working pressure, which would be lower than would be allowed if the sheets in the boiler were of uniform maximum thickness. We call attention to this fact because the dis-

covery of such practice has made serious trouble between the boilermaker and the steam user.

This business is sometimes carried so far that the edges of the plates are "upset" so as to appear thicker and heavier than they really are. We would not believe that there were men so blind to the duties and obligations which rest upon them as to resort to such practice, but the careful inspector finds all such defects, and in time we come to know whose work is carefully and honestly done, and whose is open to suspicion. In States and cities where inspection laws are in force that give the methods and rules by which the safe working pressure of a boiler is calculated, there is no alternative except to follow the rules; and if certain requirements regarding construction are a part of the law, there is no authority or right to depart from it, and yet there are boiler-makers who try to force their boilers into such localities when their work is not up to the requirements of the law. Now this boiler making is pretty serious business, and inasmuch as some one must be blamed when accident occurs, it is important that all who have to do with boilers, from their construction to their care and use, shall be honest in all their work.—*The Locomotive*.

**Transplanting Trees.**

A writer in *Farm and Fireside*, in his directions respecting the treatment of trees before their removal, states as follows:

"A tree in full leaf may be compared to a powerful pump, the roots absorbing water from the soil, which is carried upward through the stem and exhaled from the leaves in the form of vapor. This exhalation from the leaves is really the primary operation, however, being simply a process of evaporation. If, now, the principal portions of the roots be cut away, and especially the fine rootlets which are farthest from the stem and through whose extremities nearly all the water is absorbed, the leaves, if allowed to grow, will exhaust the water from the stem and roots more rapidly than it can be supplied by the remnant of the latter, and the consequence will be the destruction of the tree. Hence, in transplanting trees the leaf bearing twigs should be cut away in proportion to the loss of roots, and it should be remembered that the root surface is generally equal to that of the twigs; consequently the safest rule is to remove nearly all the branches, trimming to bare poles. It is hard to do this, but the after-growth of the tree will be enough more rapid to compensate the apparent loss. In moving large trees it is an excellent plan to dig down and cut off a large portion of the roots a year before transplanting, removing a portion of the top at the same time. This will cause the formation of new rootlets near the stem, which may be preserved in the final transplanting."

**SLOTING SHEARS.**

The slotting shears recently patented by Mr. Charles W. Crane, of Batavia, Iowa, are designed to cut slots in tin for any purpose. The shear blade is movable and is fitted to a stationary slotted die plate. The blade has a point near its pivoted end to punch through the tin to form one end of the slot, the sides of which are cut by the side edges of the shears. The slot will be limited by one of the series of ledges on the blade coming down in front of the end of a bit which is movable along the slot between the plates to be set for any ledge. The bit, shown in section in Fig. 3, has tongues running in grooves on the sides of the plates of the die. A single stroke of the blade, which is provided with a lever handle, will cut slots of different lengths. The sheet

**CRANE'S SLOTTING SHEARS.**

may be shifted sidewise to make slots wider than the blade. In order to sharpen the edges of the die plates and reset them closely to the blade, they are made separate and bolted to the table. By removing one of the die plates a straight cutter is formed. In Fig. 2 the device is shown adapted for cutting wire of all sizes. Fig. 1 shows a slotted sheet to indicate the work done by the shears. Fig. 4 shows the way of operating the shears. The apparatus is particularly applicable for making the slotted tin strips used in making the glass gauges for cream cans.



**India Ink.**

A Chinaman named Chen-ki-souen has written a monograph on the famous Chinese ink, more commonly known here as India ink. We find the following interesting extracts, regarding its history and preparation, in the *Deutsche Industrie Zeitung*.

Many articles are found in the extensive literature of China written by their learned men about the paper, ink, and brushes that they use for writing, but unfortunately very little is said about the technology of their inks. It is quite otherwise in the recent book written by Chen-ki-souen, for he describes every stage of its preparation with great accuracy and in detail.

According to our Celestial author, a kind of pigment ink was discovered 2697 to 2597 B. C. It was employed for writing on silk with a bamboo rod. Afterward an ink was prepared from a certain stone (encre de pierre), which is still known in China as ché-hsi. It was not until 280 or 220 B. C. that they began to make an ink from soot or lampblack. The soot was obtained by burning gum lac and pine wood. This ink was made at first in round balls and very soon supplanted the stone ink.

For a while the province of Kiang-si appears to have had a monopoly of ink making. Under the dynasty of Tang, in 618 to 905 A. D., there was a special officer called an inspector, who had charge of its manufacture. He had to furnish the Chinese court with a certain quantity of this ink annually. Some of the factories seem to have been "royal Chinese" factories. The Emperor Hian-Tsong (713 to 756 A. D.) founded two universities, to which he sent 336 balls of ink four times a year.

The most celebrated ink factory in China is that of Li-ting-kouéi, who lived in the latter part of the reign of Tang, and is said to have made an excellent article. He made his ink in the shape of a sword or staff, or in round cakes. The test of its authenticity consisted in breaking up the rod and putting the pieces in water; if it remained intact at the end of a month, it was genuine Li-ting-kouei. Since the death of this celebrated man there seems to have been no perceptible advance made in the manufacture of India ink.

In the manufacture of lampblack nearly everything is used that will burn. Besides pine wood we may mention petroleum, oils obtained from different plants, perfumed rice flour, bark of the pomegranate tree, rhinoceros horn, pearls, musk, etc. Nor does fraud seem to have been entirely wanting. According to Chinese authorities, the principal thing is the proper preparation of the lampblack; the best smells like musk, and the addition of musk not only serves to give poor goods the resemblance of fine ones, but really makes it worse.

The binding agent plays the chief part next to the lampblack; ordinary glue and isinglass alone are now used. In old times glue made from the horns of the rhinoceros and of deer was employed.

Good Chinese ink improves with age, and should not be used for a few years after it is made. It is not easy to keep it as it must be protected from moisture. Some persons, in rubbing it up, make circular movements that soon ruin it. It is better to rub it in straight lines back and forth with the least possible pressure.

**FIRE ESCAPE.**

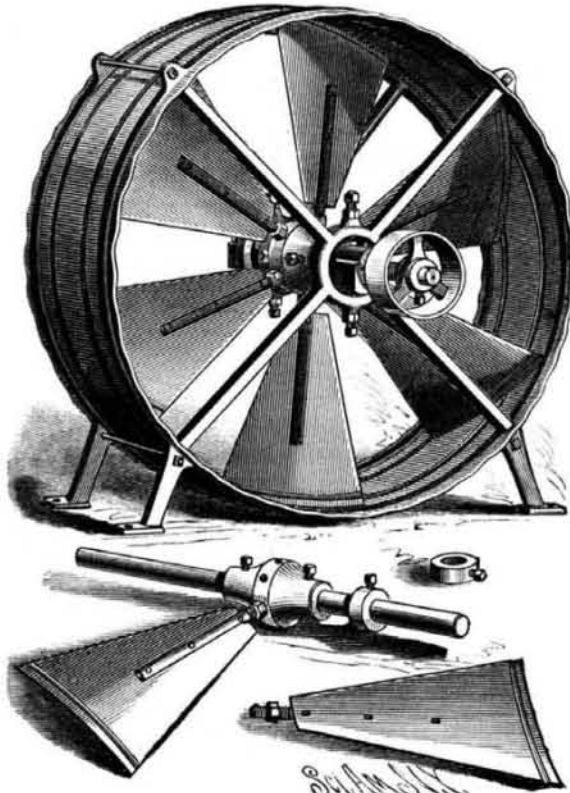
The fire escape herewith illustrated consists of balconies for each story, or for alternate stories, of a building, arranged on central pivots, on which they may be swung in such a way that the rising end of one will meet the lowering end of the next, thus forming a zigzag passage down which people may pass. Fig. 1 shows the balconies so arranged, the intermediate ones being permanently attached to the wall. The balconies are firmly bolted to the central shafts, which are square in the parts fitting the balconies, and which extend through the wall (Fig. 3), and are supported in bearing plates bolted to each side of the wall. Inside of the wall the pivots or shafts gear with a working lever by means of a toothed segment on each shaft and a vertical toothed bar gearing with the segments and also with the lever, as indicated in Fig. 4. The lever is located at the base of the wall, where it may be inclosed for its protection against fire. The vertical bar extends to the highest shaft, and is made in sections connected by swivels. The outer ends of the shafts have bearings in a long post diverging from the vertical line, in order that the rising end of one balcony will project beyond the falling end of the other, to provide safe transfer from one to the other. The balconies are made of sheet iron, with outwardly curved sides at their upper edges to deflect the flames, and are also made with double floors, between which the air will circulate, thus keeping the upper floor cool. Along the inside of the outer side plate of the balcony is a hand rail. The stationary balconies are made narrower than the others, so that persons may drop from one to the other without danger of falling to the ground. Fig. 3 is a vertical section through the wall.

The invention has been recently patented by Mr. William S. Cassidy, of Kelly's Station, Pa., who should be addressed for further information.

The French are experimenting with a new rifle, designed for infantry use, which is said to discharge three projectiles at a time.

**A NEW DISK FAN OR EXHAUSTER.**

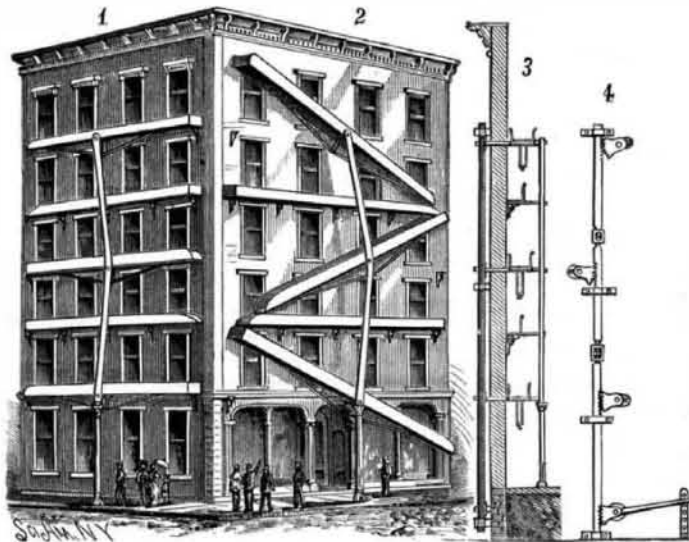
To economically move large quantities of air is a subject of great importance in many of the industries, and enters as one of the principal factors in the ventilation of large buildings. The accompanying engraving shows a fan of novel construction, which, although simple and of but few parts, may be readily and easily adjusted to suit conditions. The fan works on the principle of the screw propeller, and by a simple device the blades may be set at any pitch, so that the quantity of air moved may be varied to any point between the minimum and maximum capacity, and the same device enables the blades to be set so as to move the air in



**NEW DISK FAN OR EXHAUSTER.**

either direction. There are six curved blades made of sheet steel, having an increasing pitch augmenting the power and the amount of air moved. To each blade is riveted a heavy wrought iron arm having a thread cut upon the end, which screws into the hub and is set by means of a lock nut. This arrangement is indicated very plainly in the drawings of detached parts, representing the shaft, hub, and one blade in position, and the blade alone. The cast iron frames and sheet steel band make the "cut-off" in which the blades run, and cause a strong suction or force current. From the above it will be readily understood how the current can be changed in direction without disturbing either the belt or pipes. The shaft is in one piece, running in journals which are adjusted by two set screws, as shown. The fan may be fastened to the ceiling, the journals having been inverted.

The fan is noiseless in operation, and as the air is free to pass through the whole area, the current is much slower than in the usual forms, thus avoiding the unpleasant buzzing sound



**CASSEDY'S FIRE ESCAPE.**

caused by air passing rapidly through small openings. When necessary a rapid current can be produced by reducing the size of the pipes. It can be put at either end or at the center of a pipe; in a wall or window, and will run equally well either horizontally or perpendicularly. A 48-inch fan now on exhibition at the American Institute Fair, running at about 450 revolutions a minute, draws through the small house to which it is attached the great amount of 26,175 cubic feet of air each minute. It is run with a 3-inch belt and uses 2 horse power. These fans were awarded the highest medal at the American Institute. The patented, Mr. L. J. Wing, has perfected a plan of ventilating large edifices

with the exhaust fan run by gas engines or other small motors. These fans are now being manufactured by the Simonds Manufacturing Company, of 50 Cliff Street, New York city, who have received many letters highly commending the fan and dwelling upon the large amount of air it moves, its lightness and simplicity, and the economy its use insures.

**Mail Statistics of the World.**

The statistics of the Universal Postal Union for the year 1881, published by the International Bureau at Berne, show that the United States ranks first in number, with 45,512 offices, Great Britain being next with 14,918. Japan leads Russia, Austria, Italy, Spain, and British India. Switzerland ranks first in the relative proportion between the number of offices and the population, having an average of 985 inhabitants to each post office. In the number of letters carried Great Britain ranks first with 1,229,354,800; the United States next with 1,046,107,848; then Germany with 563,225,700. The Argentine Republic stands at the bottom of the list. The United States used the most postal cards. In respect to the number of letters and postal cards to each inhabitant, the countries ranked as follows: Great Britain, 38.7; United States, 27.3; Switzerland, 19.9; Germany, 15.8. The United States ranks first in the number of newspapers conveyed in the domestic mails with 852,180,792; Germany next with 439,089,900; France, 320,188,696; Great Britain, 140,789,100. Germany leads in respect to the gross amount of revenue with 205,324,215 francs; United States next with 194,630,444 francs; Great Britain third with 175,690,000 francs.

**Coffee and Alcohol in Brazil.**

According to the statement of the Vice Director of the Rio Janeiro faculty of medicine, it appears that in Brazil, where great quantities of coffee are used and where all the inhabitants take it many times a day, alcoholism is completely unknown; it is further stated that the immigrants arriving in that country, though beset with the passion for alcohol, contract little by little the habits of the Brazilians, acquiring their fondness for drinking coffee and their aversion for liquors; and as the children of these immigrants brought up with coffee from their early years never contract the fatal habits known to their parents, it would seem that the number of drunkards in the country is in inverse ratio to the amount of coffee consumed. A South American correspondent of the *Medical Times* confirms the above statements, asserting that the number of cafes in the large cities of Brazil—where multitudes of persons from the highest down to the lowest classes go in to take a cup of that delicious beverage which none but Brazilians know how to make properly—is enormous, while drinking saloons or bars are very few, and their patrons fewer still.

If the above is correct, our temperance advocates might take a useful hint. Less oratory and more coffee would give better success to their efforts. The opening of a cheap coffee house alongside of every gin mill might have the effect to dry up the liquor business.

**Scarlet Fever in Horses.**

For some time past scarlet fever among horses has attracted considerable attention, and committees from three medical societies are now investigating the subject. The disease was first described in horses, in 1814, and from that date to 1810 there are evidences showing its simultaneous appearance in both horses and men. The conclusion has been drawn by some writers that it originated in horses and was by them communicated to man. The *New York Sun* reports Dr. John C. Peters, chairman of each committee, as saying:

"The most remarkable results have been obtained by D. J. W. Steckler, of Orange, N. J. He had some equine virus sent to him by Dr. Williams, of Edinburgh. Dr. Steckler inoculated twelve children, who were afterward exposed to the disease of scarlet fever and did not take it. That was last May or June. He has inoculated two young colts and reproduced the disease among them. He failed with a calf, showing that the horses were more susceptible of the disease. Another set of children was inoculated, all of whom were living in the same room where a case of scarlet fever had broken out. Some who had been exposed before the inoculation took the disease; but a majority escaped. There was only one case that looked like failure. Dr. Steckler will cultivate the virus and prove his experiments. He is sure to meet with great opposition, and possibly as much as Jenner did, but I have no doubt he has made a discovery as great as Jenner's, and one that will prove as signal an epoch in the history of medicine."

Cleanliness in the stable, good ventilation, pure water, and reliable disinfectants, are the best preventives.

**Percussion of the Skull as a Means of Diagnosis.**

In the course of an article in the *Lancet*, Dr. A. Robertson tells us that in a case under his care, percussion of the skull revealed a painful area over the motor region of one side of the brain. The patient had long been subject to convulsive seizures, mainly unilateral, and has greatly improved since the application of a series of blisters over this region.