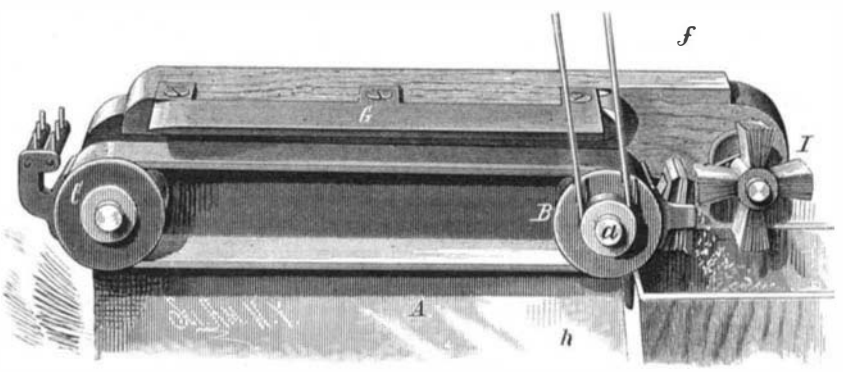
COLLECTING AND REMOVING WASTE FROM SPINNING MACHINES.

The apparatus herewith illustrated can be attached to any kind of spinning machine, and will keep the roller beam and floor clear of waste, beside enabling the spinner to do a third more work than could be done without it. Beneath the electrical rod, G, travels a belt carrying two cushions that touch each face of the rod; these are followed by a comb. All the loose fibers and broken threads are drawn to the rod, thus keeping the roller beam clean, and by gathering the waste that would accumulate on the floor, prevent it from becoming dirty and worthless. The waste is taken from the comb by the rapidly revolving brush, I, and deposited in the box.

By the use of this device the threads are prevented from running double or winding around the rolls, thereby lifting them and forming imperfect threads. The rolls being kept clean, the usual under cleaner is dispensed with. The roller beam and mule carriage being kept clean, the fly waste is kept out of the yarn and off the spindles. The waste is saved in a clean condition instead of becoming dirty refuse. One of the most important features of this device is that by using it manufacturers can avoid the making of a very large per cent of what is now styled imperfect cloth.

Further particulars regarding this invention may be obtained from the patentee, Mr. W. A. Delmage, 11 Bridge Street, Lowell, Mass.



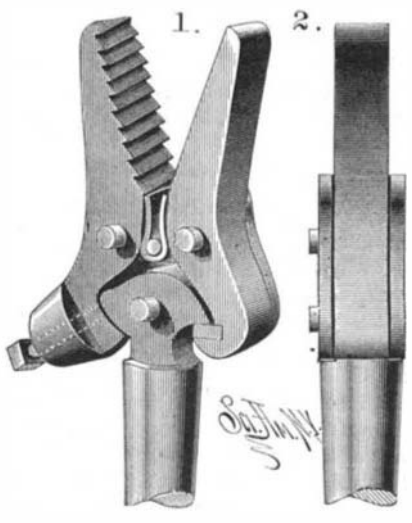
APPARATUS FOR COLLECTING AND REMOVING WASTE FROM SPINNING MACHINES.

Fall of a Meteorite.

It is reported that the French Academy of Sciences has just received an interesting account of a meteorite which fell not long ago near Odessa. A bright serpentine trail of fire was seen one morning to pass over that town; and the editor of one of the papers, surmising that a meteoric mass might have fallen from the sky, offered a reward to any one who would bring it to him. A peasant, who had been terribly frightened by the stone falling close to him as he worked in the fields, and burying itself in the ground, answered this appeal. He had dug the stone out of the soil, and preserved it, keeping the matter quite secret from his neighbors, as he feared ridicule. This stone was found to be a shapeless mass weighing nearly eighteen pounds. The fall of another meteorite, which in its descent wounded a man, was also reported; but it had been broken into fragments and distributed among the peasants, who preserved them as talismans.

IMPROVED WRENCH.

An invention recently patented by Mr. D. M. De Silva, of Corning, N. Y., is shown in the accompanying engraving. The tapering jaws and the handle are pivoted between two plates forming a head block; each jaw has a curved arm extending back from the pivots in the direction of the handle. The handle has cams that bear on the inner sides of the curved portions when the jaws are open, and they move along the curves when the handle is passed to the right—the jaws having been placed on the object to be turned—and wedge the arms apart, forcing the jaws together with great power for gripping the object. Since the force of the grip is in proportion to the force applied to the handle, the object offering great resistance will be gripped accordingly. The jaws are opened by a spring, placed between them, when the handle is shifted back. A book on one of the jaws comes



DE SILVA'S IMPROVED WRENCH.

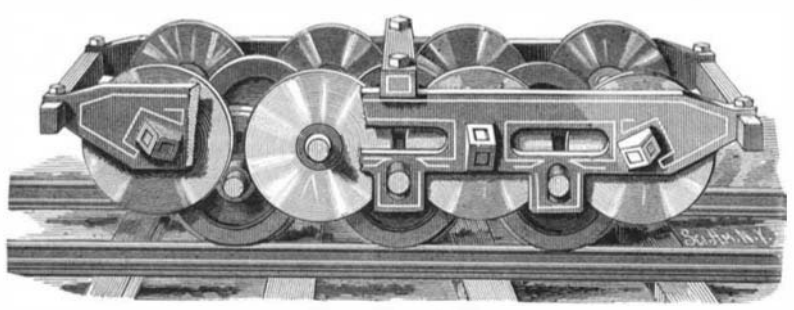
in contact with a shoulder formed on the handle to limit the backward swing of the handle to a line with the jaws. In order that the arms may be set to grasp small articles, one of the arms is provided with an adjusting screw that can be set in against the cam to lessen the extent of opening of the jaws. One or both of the jaws may be serrated to obtain greater holding power; one may be made with a beveled face, whereby the corners of the serrations at the highest side of the face will bite quickly, causing the jaws to grip more securely and without slip.

Measuring the Height of Trees.

In a recent number of the SCIENTIFIC AMERICAN SUPPLEMENT we gave a description, with illustrations, of a simple instrument for measuring the heights of trees, monuments, etc., with directions for its use. It is a cheap and efficient contrivance, styled a dendrometer, and was said to have been invented by Mr. Kay, forester to the Marquis of Bute. We are now, however, in receipt of a communication from a subscriber in Vienna, Austria, saying that the writer used this instrument to his great satisfaction forty and more years ago in buying timber for mining purposes. The invention was awarded a first class silver medal by the Scottish Arboricultural Society.

CAR TRUCK.

The axles of the wheels of the railway car truck shown in the engraving have their bearings against superimposed wheels which are so placed as to bear upon opposite sides of the journals of the axles above their centers. The superimposed wheels are made as large as is practicable; and are arranged in pairs—one upon each end of an axle extending across the frame. The arrangement and construction of the truck will be readily understood from the cut, in which a portion of the frame is cut away in order to show more clearly the journal formed by the superimposed wheels.



McCONNELL'S CAR TRUCK

This plan makes a slowly rolling bearing for the car axle, and the large size of the upper wheels causes their journals to turn at such a reduced velocity as to have but very little friction, so that all liability of heating is obviated. Thus wear of the bearings is reduced, and a large saving of oil and waste effected. Increased steadiness in running is also accomplished by this method.

This invention has been patented by Mr. A. E. McConnell, 197 Clio Street, New Orleans, La.

English vs. Arab Swords.

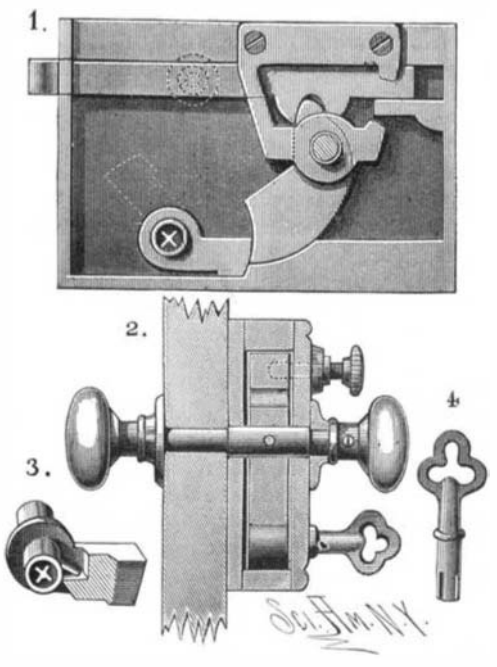
An English manufacturer of cavalry swords has recently made some severe criticisms of the manner of testing swords for the British army. The sword blades are taken to an official viewer, who is a civilian, and by him tested as regards balance, weight, and length. They are also gauged as regards size. Then the real test is applied. They are struck on a butcher's block by the viewer, and, if the result is considered favorable, they are passed. The operation is, of course, liable to great uncertainty, as no two men will strike with equal force, nor will the same man at different periods of the day. A method of testing swords much more severely, and in a way certain to be uniform, is afforded by a machine now in use by private manufacturers of the best goods, but it has not been adopted by the Government. The swords used by the Arabs in the Soudan have a heavy curve, and an edge which is kept as sharp as a razor, for use in cutting only, and not for thrusting, which is the only practice known in European swordsmanship. The Eastern swordsman seldom or never guards with his sword, and the hilt is made so small as to allow no play whatever to the wrist, so that when he cuts he does so from the shoulder, bringing into action all the strong muscles of the forearm and the back. The terrific force of a cut made in this way may be estimated from the accounts we have of the Sikh war, and many battles in India, where arms, heads, and legs have frequently been taken off at a single blow, which far exceeds anything that has been or probably can be done by the light, slightly-curved sword used in the European fashion. This is the reason why the hilts of all Eastern swords are made so small—not wholly in consequence of the smaller hands of the natives, but because a larger hilt would be a disadvantage, by weakening the firmness of the grasp, and consequently the force of the blow, in this method of cutting.

Traps for Inventors.

As soon as the United States Government grants an inventor a patent, and the *Official Gazette* of the Patent Office announces the fact, that inventor receives an alarming addition to his mail every day for a week. Advertisements, circulars, and letters come to him from patent agents, patent venders, patent institutes, bureaus, and all sorts of companies, firms, and individuals. All of these letters and circulars express a warm interest in the invention in question, and a desire to benefit the inventor. They are all philanthropic in tone, and suppress any indication of desire for gain. It is for the inventor's good only that they write. On closer investigation it is found, however, that every one of these disinterested individuals needs some pecuniary acknowledgment before any business can be done with them. One man wants a $5 or a $10 fee for advising the inventor what to do; another wants money to print circulars of the invention; another wants to exhibit the model in a room with other models, or wants to make a model; others want to negotiate for territory or sell rights, and so on. But every one needs more or less money in hand to do these things. The inventor who gets his first patent is dazed at all these offers, and sees so many tempting methods employed to make money that he is often deluded into parting with his coin without any very definite understanding of what he is to get in return. All sorts of traps are set for unwary inventors. There is a class of men who prey on them. Inventors, as a class, are enthusiastic and sanguine. They believe their devices are of the greatest benefit and highest importance. Men who acknowledge and recognize this, and who praise their inventive genius, are apt to gain their confidence, and too often this confidence is abused. Any respectable and reputable patent soliciting firm will advise its clients to be exceedingly careful of the persons with whom they transact business in patents or patent article. There are so many frauds that it is difficult to segregate them from people in legitimate business.—*Mining and Scientific Press.*

A NEW LOCK.

The bolt of the lock herewith illustrated has two studs projecting from its lower edge, to form a recess in which enters the toe formed at the upper end of the weighted tumbler secured to the knob spindle. The bar shown in the lower part of Fig. 1, and detached in Fig. 3, is turned by a key to a position in which it will not interfere with the movement of the tumbler; or to the position indicated in Fig. 1, where it locks the tumbler and prevents the shifting of the bolt. Threaded into the lock case is a screw pin, which enters a hole in the side of the bolt as a further security against unlocking. When the lock is used as a latch only the lock bar is swung back and away from the tumbler, leaving the latter free to be moved by the knob spindle. When the knob is released, the bolt will be thrown outward by the downward movement of the tumbler acted upon by its own gravity. The lock can be readily made for either a right or left hand door, and as it is entirely devoid of springs or delicate parts liable to be broken, it can be cheaply, strongly, and durably made; it can be used either as a latch or lock, the adjustments for either being easily made.



MIKESELL'S NEW LOCK.

This invention has been patented by Mr. M. L. Mikesell, of Muscatine, Ia.

A writer in the *Medical Times and Gazette* recommends the use of hot milk as a restorative. Milk when heated above 100° F. loses its sweetness and density, but has a most beneficial influence over mind and body when exhausted by labor or mental strain. Its effects are more invigorating and enduring than those of alcoholic stimulants.

Digging Wells.

The Massachusetts *Ploughman* some time since had the following directions in regard to digging wells:

The old way of digging a well and stoning it up so as to leave it about 3 feet in diameter, is a very good one if the water is to be drawn up with buckets; but if only with a pump, it is a very poor way; for if, as is the usual custom, the well be covered at the top, it leaves a very large space for dead air, which often becomes so bad that it affects the quality of the water, and also makes it unsafe to enter the well. When a well thus stoned has only a pump in it, the covering should be under water, or very near it; but if it is known that only a pump is to be used, the expense of stoning may be saved, and the water kept in a much better condition. This is done by digging the well in a dry time, and when dug as low as possible a cement pipe, some 2 feet in diameter and 2 or 3 feet long, is sunk at the bottom, and worked down as low as possible by digging out the inside. The pipe should be covered over with a flat stone, through the middle of which a two-inch hole has been drilled; directly over this hole stand up drain pipe, then begin to fill in the hole. When filled as high as the top of the first piece of drain pipe, put on another, being careful to have it straight with the other and the line perpendicular; continue filling and adding drain pipe until it is as high as the surrounding ground; or if the pump is not to stand directly over the well, then when it is filled within 4 feet of the surface put in the pump pipe and lead it off in a trench to where the pump is to stand. When it is found that the pipe is all right, finish filling the well, leaving some durable mark that the position of the well may be known.

A well of this kind is reliable and permanent, requiring no repairs; the water is cool and free from impurities that open wells are subject to; no insects or animals can find their way into it, and the cost is not more than one-half that of a well that is stoned. If dug, as it should be, when the springs are low, a constant supply of water that is as pure as the underground springs is secured. As the well is always full, there is no chance for bad air to injure the water, and, in fact, but little danger of being polluted by surrounding cesspools compared to that of open wells.

The Victims of Car Coupling.

Notwithstanding the great number of automatic couplers invented, probably most railroad men to-day are not convinced that there is one that meets the requirements. Even if they were, they would hesitate to adopt one which might not couple with the cars of their connections. Thus to the necessity of finding an efficient apparatus by which cars may be coupled without going between them there is added the further necessity of uniform and simultaneous action by the railroad companies concerning a matter not well understood, and regarding which opinions at present are likely to be very diverse.

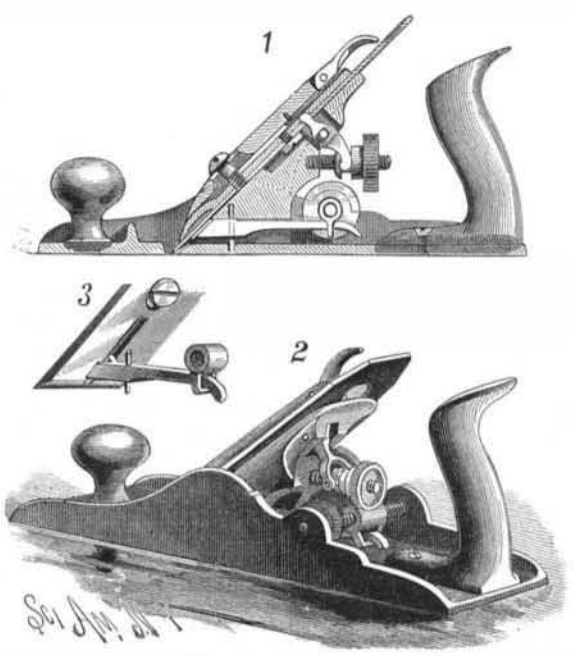
But the crushing and mangling of men by the thousands calls for some effort, at least, to prevent it, even if the way is not quite clear and action will be difficult. It justifies extraordinary methods, efforts, and expenditures. If it is true, as it probably is, that the railroad companies do not generally know of apparatus that will prevent the coupling slaughters, they should lose no time in finding out, in testing whatever has any promise with such thoroughness and completeness that they will all thereafter know what can and what cannot be done by the appliances offered for their use.

If they had had to pay for the killed and maimed brakemen, as they do for killed and maimed passengers, they would have been terribly exercised about the matter long ago; for the stockholder, not coming in contact with the victims, feels such things only in his pocket; and the pressure of the stockholder to save money *plus* the humanity of the operating officer is certainly more effective than the humanity alone. But even a modification of the employers' liability law, which would give the employe substantially the same rights as the passenger, might not greatly help in this matter; for, as we have said, the sufferers in car coupling are largely guilty of "contributory negligence," which would exonerate the company, even if a passenger were a victim. This kind of contributory negligence, though a good reason why the victim should not receive damages, is not always a good reason why the employer should not pay them.

This matter should not be allowed to rest, but its agitation by the inventors of car couplers alone is hardly likely to be fruitful. The railroad men should take it up, and they should need no other incitement than the regiments of men their cars have crippled and the companies of them they have killed.—*Railroad Gazette.*

BENCH PLANE.

Fig. 1 is a vertical longitudinal section, Fig. 2 is a perspective view, and Fig. 3 shows the arrangement for securing the lateral movement of the plane iron of a bench plane for which letters patent were recently issued to Mr. N. E. Curtis, of Mauston, Wis. In the upper surface of the bed piece is a groove to receive the screws which clamp the plane and cap iron together. This groove is long enough to permit the greatest required range of longitudinal movement of the plane iron, while it holds the sides of the screw head so closely as to admit of little or no lateral motion of the iron at that point. Fulcrumed in the bed piece is a lever, the short arm of which enters a hole in the cap iron; the long



CURTIS' BENCH PLANE.

arm is engaged by a milled nut on a screw threaded stud projecting from the back of the bed piece. By turning the nut the plane iron is adjusted longitudinally in the usual way. The plane iron and cap iron are held in place by a clamping lever similar to others in use; but the distance between the screw and the lower end has been shortened, and the distance between the screw and cam lever pivoted in the upper end has been increased, thereby securing greater leverage and increasing the firmness with which the plane iron is held in place.

A lever is fulcrumed in a mortise in the lower portion of the bed piece, so as to swing in a plane parallel with the face of the plane body. One arm of the lever is beveled and provided with a tongue entering a groove in the back of the plane iron. The long arm extends beyond the rear of the bed piece, and is moved by a traveling nut carried upon a screw journaled transversely in the plane body and having a milled head. By turning the screw in one direction or the other the lever is correspondingly moved, and the plane iron, by means of its engagement with the lever, is swung laterally, the clamping screw being the center of motion.

This construction enables the user to readily and accurately adjust the cutting edge of the plane iron so that it will be parallel with the face of the plane, and also enables him to quickly place the cutting edge at any desired height.

ON the Pennsylvania Railway the average consumption of fuel for all passenger trains is 56 pounds per train mile.

A PHOTOGRAPHIC REVOLVER FOR AMATEURS.

The apparatus which we are about to describe, and which is manufactured by Mr. E. Enjalbert, is very ingenious, very well conceived, and will, we believe, meet with great success. It is a true pocket revolver with barrel, stock, and cock, but instead of serving to throw deadly leaden balls it is designed for taking very small photographic negatives four centimeters square. Upon pulling the trigger the sensitized plates succeed one another, and the operator can thus suddenly take ten successive photographs without touching his weapon. These small photographs may be afterward enlarged, and serve as useful documents for tourists, amateurs, and artists.

With this little revolver there is no longer any focusing to be done, no more plates to be changed, and instantaneous views are obtained by an exposure of one-fiftieth of a second. The apparatus is always hermetically closed to the light, and it permits of following objects in motion with great facility, and without its being necessary to take accurate aim as with an ordinary revolver, since it is merely a question of taking such a general view as is comprised within the field of the objective.

The apparatus consists of five principal parts, which are shown in detail in the annexed figure.

1. *The Barrel.*—In this is adjusted the rapid, rectilinear objective, which consists of two achromatic menisci that are symmetrically arranged to give a focal distance of 0·042 mm. The revolver may be used from a distance of 4 5 meters, since, owing to the combination of the lenses' curves, the different planes are then all in focus. The ever tedious operation of focusing is thus avoided. The diaphragms accompanying the apparatus are placed in the very interior of the objective, between the two lenses.

2. *The Camera.*—This consists of a cylinder, H, that contains a shutter, A, and a frame holder, C. It is into the front end of this chamber that the barrel is screwed. The shutter, A, is capable of revolving freely upon its axis. It contains an aperture, B, equal to a quarter of its surface, and carries a small clockwork movement that gears with the pinion of the axis of the camera. This clockwork movement, when its spring expands during its revolution, necessarily carries along the shutter. The spring is wound up by revolving the cylinder, G, when it is in place. At this moment, in fact, it catches and holds the end of the axle, which enters a square aperture in its center. Upon pulling the trigger the two teeth seen at K are thrust forward. The first of these, which, when at rest, stops the shutter, now frees it and allows it to make one revolution that opens and instantaneously closes the apparatus. The shutter, on reaching the lower end of its travel, abuts against the second tooth. The shuttle-motion that occurs in the rear when the trigger is freed disengages this second tooth, and allows the first to engage with the starting notch again, so that the shutter is then ready to operate anew if the spring is sufficiently taut.

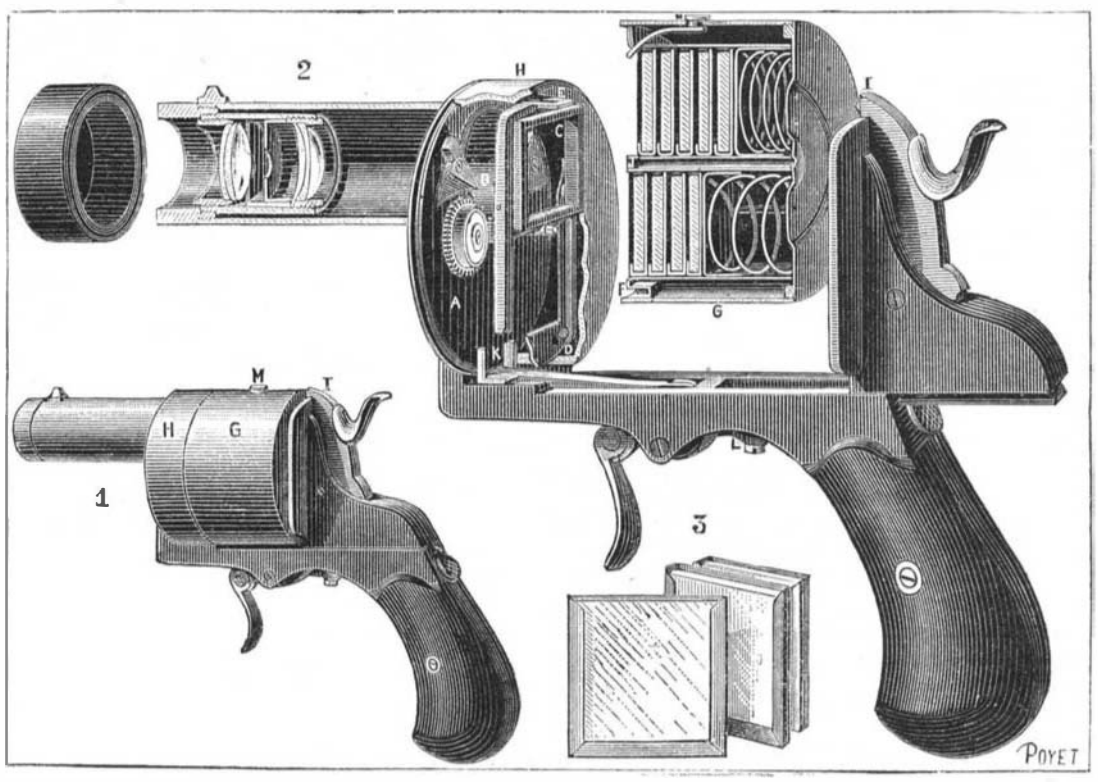
The frame holder, C, is hinged beneath, at D, and terminates above in a bent tooth, E, which causes it to advance or recoil a distance equal to the thickness of one of the frames, according as it has in front of it the upper or lower case. This motion is obtained by means of the rabbet, F, at the bottom of the cylinder.

3. *The Plate Cylinder.*—This is divided into two rectangular compartments in which slide two plates that are thrust forward by spiral springs. The upper case contains the sensitized plates held in their frames (shown of actual size in Fig. 3), while the lower one collects them in measure as they have been exposed.

The cylinder, G, revolves through the friction of its edges against the chamber, H.

When the upper case is opposite the aperture, C, the tooth, E, forces back the frame holder, the first frame enters the open space in front of it, and the glass is thus in place for the operation. In order to remove this glass and substitute the succeeding one for it, the cylinder is made to perform one entire revolution. The first glass remains in the aperture, C, in the camera, when the cylinder begins to revolve. Then, the revolution continuing, when the second compartment comes opposite this glass the tooth, E, enters the rabbet, F, and the glass naturally enters the said compartment. The revolution still continuing, the cylinder takes its position again, and the second glass, now become the first, is, in its turn, made to enter the camera.

3. *The Movable Breech*, which is fixed upon the stock by a dovetail, serves to shove the cylinder, G, up against the camera, H. It carries a spring cock, whose extremity, I, enters a recess in the back of the cylinder and prevents the latter from revolving, and also indicates the position of the cases when they are well opposite the objective.



ENJALBERT'S PHOTO-REVOLVER

(Fig. 1.—One-half actual size. Fig. 2.—Slightly reduced. Fig. 3.—Sensitive plates—actual size.)