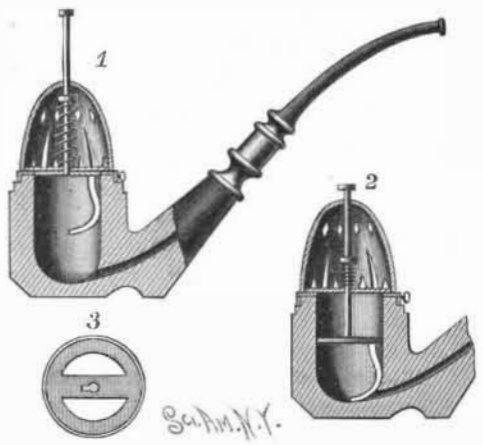
AN IMPROVED TOBACCO PIPE.

A pipe in which the tobacco can be pressed down in the bowl, or loosened if pressed too closely, and in which the bottom of the bowl can be conveniently scraped and cleaned, is illustrated herewith, and has been patented by Messrs. Thomas B. Whitledge, George W. Kenner, and Michael Rueckert, of St. Mary's, Mo. To a ring plate on the edge of the bowl is hinged a cap or lid, having air holes, this lid having at its base a web, shown in Fig. 3. A pusher rod passes through the top of the cap and the center of the web, carrying at its lower end a disk constituting a tobacco presser, this disk having perforations, while a curved bowl-

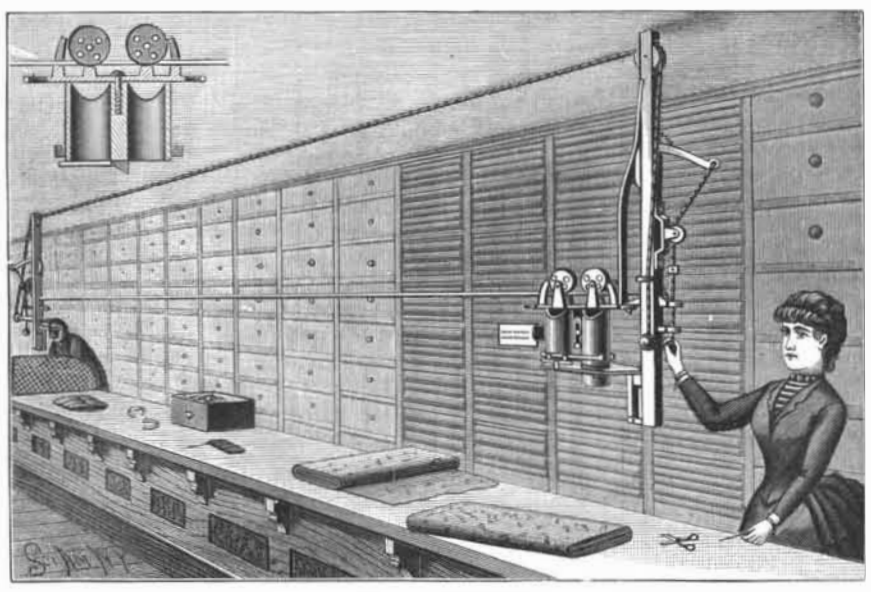


AN IMPROVED TOBACCO PIPE.

cleaner arm projects downward from its edge. A spiral spring around the pusher rod holds it normally in the position shown in Fig. 1, but the rod has a shoulder adapted to engage a slot in the web at the base of the lid, whereby it may be held in the position shown in Fig. 2, for the partial rotation of the cleaner arm in the bottom of the bowl.

AN IMPROVED STORE SERVICE APPARATUS.

A carrier for cash, messages, and parcels, etc., from one place to another in a store, is illustrated herewith, and has been patented by Mr. Hubert Hebert, of Lake Linden, Mich. Between a post located near the cashier's desk and one in another part of the store is stretched a track formed of a rope or strip of any suitable material, a suspended carrier traveling on this track by means of grooved wheels. On the bottom of the plate to which the wheels are secured are the downwardly extending compartments of the carrier, as shown in the sectional view, both open at the bottom, and having side openings near the top for inserting money or parcels. On the lower ends of the compartments is held a bottom adapted to cover one or the other of their open ends, the bottom being held to slide longitudinally on guideways, and being locked in place by bolts sliding vertically. On the front and rear of the bottom are downwardly extending lugs adapted to engage the front and rear edges of plates secured to the posts, preventing the bottom from moving with the carrier as the latter nears the end of its route, a short tube on the inner end of each plate being adapted to register with the open lower end of one of the compartments. On the top of the plate to which the grooved wheels are secured are lugs against which operate the free ends of vertical springs secured to each of the end posts, the springs being acted upon by levers fulcrumed on the posts, the cords connected with the ends of the levers having dependent balls or



HEBERT'S STORE SERVICE CARRIER.

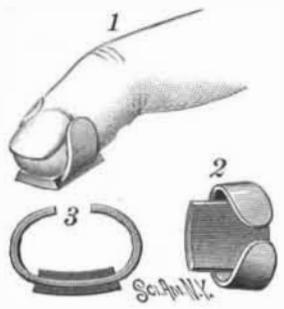
handles within easy reach. Each of these cords also has an attached block adapted to release a catch by which the carrier is held in locked position, when the pull on the cord has put the propelling spring under sufficient tension. The cord extending from one post to the other near the ceiling is so connected that the operator sending the parcel, etc., at a distance from the cashier's desk, can bring the carrier back again. As the carrier in its forward movement nears the cashier's desk, the downwardly extending lugs on its bottom engage the edges of the plate attached to the post, so that the bottom is held while the carrier moves forward the width of one of its compartments, its open compartment then registering with the tube over the desk, so that the parcel or money drops out. On the post at the cashier's desk there is, also, a pin adapted to open a spring clamp secured to one of the compartments of the carrier, the clamp being adapted to hold written messages, which are released by the contact of the carrier with the pin, so that the message drops out on the desk.

A Village Destroyed by Ice.

Advices from the fishing village of Kerschkaranza, in Kola, a peninsula on the White Sea, describe a wonderful phenomenon, new in Arctic annals, which took place on January 5th last. At 4 o'clock in the morning the inhabitants were awakened by a series of heavy, dull detonations, like heavy artillery. Shortly afterward a great ice wall to the northwest, several hundred feet high, was seen to be moving toward the village, doubtless in consequence of the pressure of the ocean of ice outside. The ice hills came slowly but irresistibly onward, and passed over the village, which they completely erased, and kept onward for a mile inland. The ice traveled a mile and a half in four hours. The villagers saved their lives, but little else.—*Philadelphia Press.*

A FINGER SHIELD FOR MUSICIANS.

A simple and inexpensive device for the protection of the fingers of musicians while playing on stringed instruments, such as the guitar and harp, has been patented by Mr. Anton Ahlquist, of Ishpeming, Mich., and is illustrated herewith, Fig. 3 showing the device in transverse section. It consists of a curved strip of metal adapted to receive the end of the finger or thumb, and provided with a covering of leather or analogous material. To the outer surface of this covering is applied a mixture of Venice turpentine and pine pitch, preferably mixed in about the proportions of



AHLQUIST'S FINGER SHIELD.

three parts of turpentine and one of pitch, the design being to thus render the playing more comfortable and insure a more positive action of the finger upon the string.

Carbons.

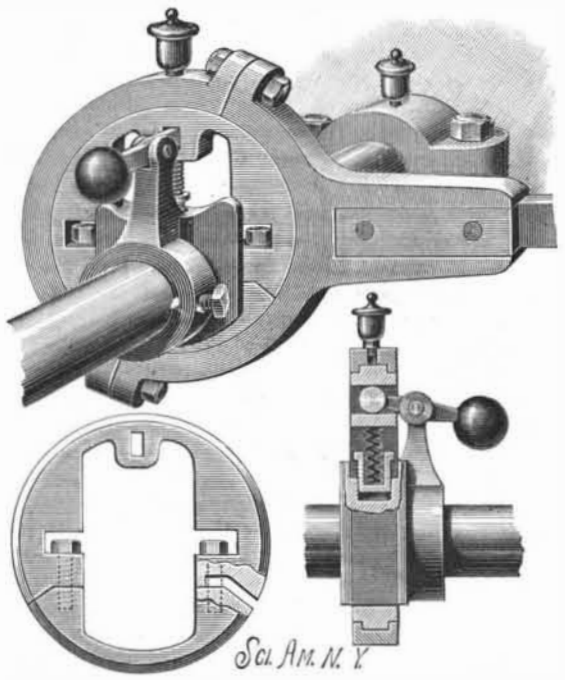
There are said to be 150,000 carbons burned daily in the electric lights used in the United States, of which 100,000 are manufactured in Cleveland, Ohio. Six years ago all the carbons burned in this country were made in a single room in Boston. Now there are twenty carbon furnaces in Cleveland alone. The carbons are made chiefly of the residuum of oil after it has been refined, and the deposit about natural gas wells is also coming into use. The material is ground to a powder, a little pitch is added, and the substance is then placed in moulds. These are packed in boxes and the latter placed in a furnace, where they are subjected to the most intense heat.

The capacity of an ordinary furnace is 45,000 carbons.

A BLOWER is being placed in the Shaw mill, Bath, Me., and a tunnel is being led from the mill to the electric light station, about fifty yards distant, by which all the sawdust of the mill is to be blown from the mill to the electric light station, where it will be used for fuel. There is said to be considerable rejoicing among 'longshoremen that this is being done, as for several years past the sawdust of the mill has been thrown overboard, and the depth of the river and docks has been materially lessened in consequence.

AN IMPROVED CUT-OFF VALVE GEAR.

An improved cut-off for regulating, automatically, the travel of a valve of a steam engine according to the speed of the main driving shaft is illustrated herewith, and has been patented by Mr. George B. Rait, of



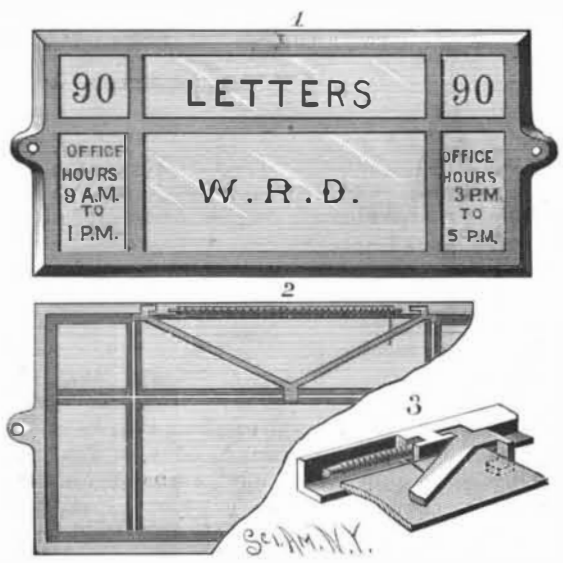
RAIT'S CUT-OFF VALVE GEAR.

Everly, Iowa. A shaft block secured to the main driving shaft has parallel ways on two of its sides in which fit the parallel side walls of an eccentric made to slide thereon, an expansion spring within the central opening of the eccentric, as shown in the sectional view, bearing against one of its end walls and against the adjacent end of the shaft block. This spring is balanced by a vertically swinging lever, mounted at right angles to the block and eccentric, weighted at its outer end, and engaging the eccentric at its inner end to throw the eccentric against the action of the spring, the latter being of sufficient tension to hold the eccentric in its proper position for the desired rate of speed.

When the speed exceeds this rate, the ball of the lever is thrown outward by centrifugal force, causing the eccentric to slide toward the center on the shaft block, and making the valve cut off sooner, thus admitting less steam to the cylinder, and diminishing the speed of the engine, until the normal point is reached. The eccentric is preferably made in two parts, as shown in one of the views, fastened together by bolts and rivets, for convenience in placing on the guideways of the shaft block.

AN IMPROVED LETTER BOX DOOR PLATE.

A door plate adapted to serve for the name and number, to show office hours, or give other information, and also adapted for use as a letter box door, is illustrated herewith and has been patented by Mr. Rolf Stafsvick, of No. 187 North Morgan Street, Chicago, Ill. The frame is formed of a rectangular casting, arranged to furnish such compartments as desired, the exterior as well as the longitudinal and transverse bars of the frame being rabbeted on the back to receive glass panels. In the back of the upper bar are formed right-angled recesses for receiving the pivotal ends of a Y-shaped frame, as shown in Figs. 2 and 3, the pivots being held in their places by setting the metal of the frame



STAFSVICK'S LETTER BOX DOOR PLATE.

partly over them. In a recess in the back of the top bar is a rod which supports a spiral torsion spring, one end of which rests upon the Y-shaped frame in such manner as to press it in the direction required to close the letter box door, behind which, inside the door, the letter box is arranged.

Scientific Research.*

"In the early years after the foundation of the government, a few great men were interested in the philosophy of science, in its facts, and in research. Franklin was a physicist, Jefferson a naturalist, and Gallatin an anthropologist. These and other great men of the time drank deeply at the fountain of science; but they were statesmen, or they had other callings and made the advancement of science a secondary purpose. But slowly scientific men rose, one after another, who devoted their entire energies to research. In the last generation a galaxy of great scientific men appeared in the American firmament: Henry, Bache, Pierce, the Rogers brothers, Gray, Baird, and many others. These men devoted their lives to research and instruction in science. In 1840 they organized the Association of Geologists and Naturalists, and in 1848 they transformed that society into the American Association for the Advancement of Science. Since that time the society has embraced in its membership all or nearly all of the scientific men of America, and in the list of its officers—presidents, vice-presidents, and secretaries—the names of many of the illustrious scientific men of the country are enrolled.

"Most of the great men of that generation have sailed away on the unknown sea. A few only, like Dana, Hall, Newberry, and Lesley, remain to guide in our councils and to cheer on the labors of the present generation of investigators. The society which they organized has grown with the growth of the country and the far more rapid growth of science, until it embraces a membership that constitutes a vast corps of laborers who occupy the border land of knowledge, which is the field of research. To enumerate in systematic order the fields of research occupied by the various members of this association would be to formulate a classification of the sciences.

"Atoms, mountains, and worlds, with all inorganic bodies and all inorganic motions, are to be examined in the study of the inorganic realm. The phenomena of nature are qualitative and quantitative, and out of quantitative relation the abstract science of mathematics has been developed, and this science of measurement is rapidly being applied to the qualitative sciences. There are many men engaged in mathematical researches. There are members who study the stars, compute their distances, and determine their courses, and who are seeking to solve the mysteries of the constitution of the bright sun and the pale moon; for on the chariot of light they drive through the storms of the greater orb and explore the dim fields of the lesser. Others with patient labor seek to discover the nature of light, of electricity, and of gravity—the mysterious force that impels the universe. There are others, many others, who are investigating the minute constitution of matter and determining its many forms. These forms are forever changing. The crystals of the rocks that make up the mountain mass are dissolved and their atoms redistributed in new forms, and chemical changes are in progress wherever human investigation can penetrate. The tree grows and decays, and man is but a form—a mould, through which streams of atoms pour in waves of chemic change. So the chemist studies the laws which govern the constitution of bodies and under which they are forever flux. There are others who are studying the molar motions and mechanical powers by which waters are made to turn mills, winds to waft vessels, and steam to drag cars. There are others who study the atmosphere which bathes the earth. They study the coming and going of storms, where fierce cyclones are born, how the cold wave creeps from polar regions, and the hot wave from the tropics. There are others who are studying the surface of the earth—the lands and seas in all their places and forms. At the far North there is a region walled by ice, a million and a half square miles in extent; but even into this land of ice they penetrate. About the South Pole there is an area of seven million square miles inclosed by a barrier of ice—an unknown region into which the modern scholar is bound to enter. Between these walls the whole habitable earth is spread, and they are exploring all its seas, navigating all its rivers, climbing all its mountains, and threading all its canons.

"A great army of men is engaged in the study of the constitution of the earth—the origin of mountains and valleys, of hills and prairies, of volcanoes and geysers, of cataracts and caves, and of rivers and lakes and seas. They examine the great coral reefs and islands of the sea, and they study the great coral rocks of the land—the fossil reefs and islands of ages gone by. Climbing among cliffs, they study the anatomy of dead volcanoes, and climbing to the brink of craters, they study the physiology of living volcanoes. If an earthquake rends the rocks, they measure the vibrations of its waves, and with the eye of science penetrate to the center of the disturbance, and draw upon their maps the lines of weakness in the crust of the earth. They follow the sands that are washed by storms from the mountain sides until they find them built by the sea into islands and coasts. With microscope and crucible they study the constitution of granite, basalt, trachyte, and other rocks, wherein appear the crystal forms of many minerals. They show that the grand mountain form, with its crags, and peaks, and grottoes, where forests stand, where lakes are embosomed, and where cataracts flash in the sunshine, is indeed an aggregation of many gems beautiful in form and brilliant in color.

"But man is not satisfied with the knowledge which comes with the study of the inorganic realm; he essays to solve the mysteries of life. An army of men is engaged in the investigation of vegetable life. They find minute but beautiful plants that grow as dust on polar ice; in dank fields they find fungi, on rocks they find mosses, on the waves they find sea weeds, on tropical trees they find orchids, on the prairies they find asters, in the savannas they find lilies, in the jungle they find palms, in the forests they find oaks, on the mountain flanks they find sequoias; and they study all these forms and a thousand more, and out of their study grows the science of botany. Then they must know how these forms became, and they trace their origin in the dim past, and they exhume the forms of plant life from the tombs of ancient meadows and groves.

"Then another army of men is engaged in the investigation of animal life, and they find the land and sea teeming with varied forms. In the sea the coral animals grow and build their weird structures. On the bottom and shores of the sea mollusks crawl, carrying with them their pearl-lined homes. There are mollusks in all the lakes, in all the rivers, in all the brooks, and in all the ponds, and they wander over the lands and climb the trees. On the lands there are crawling worms, and in the seas crawling articulates, and the world is covered with crawling insects. The ants live in cities of their own building, the bees live on the clover blossoms, and the butterflies play among the roses. The fishes swim in the waters, the reptiles crawl in the marshes, the birds fly in the air, and the beasts roam over the land. These animal forms are studied and classified, and we have systematic zoology. But this is not all of zoology. In the life of every living thing there is a wonderful history of transformation; so zoologists study the birth, growth, and death of animals. Then they discover the origin of present tribes, by investigating the forms of life that have existed in the past, and they call upon the rocks to reveal their evolution.

"Man essays to learn the marvelous structure of the human form, and the working of this complicated organism, and the processes by which the materials of the world are transformed into brawn and brain, and by which the powers of the dead universe are transformed into life. This study gives us the science of human biology. Having learned how men live, scholars seek to learn how men may live longer. In his quest to know, man has transformed plains into fields, prairies into gardens, forests into orchards, tribes of wild beasts into herds and flocks; he makes the cataract his slave, and laughs at the lightning; the multitude of enemies by which he was once surrounded have now become his friends; in his puissance he seems to have conquered all; but while he has subdued many of his great enemies, he is surrounded by hosts of infinitesimal foes. He fears no attack of the lion, but he surrenders in death at the attack of the microbe, yet by light of science he seeks to disarm and destroy these infinitesimal foes.

"Man is an animal in body, stomach, and legs; but then he is an animal with opinions, and forever he has been systematizing these opinions into philosophies. In the earliest philosophy everything was endowed with life and deified—stones, trees, fountains, forests, beasts, winds, waves, and stars; and the mysteries of the universe were explained by making all these things intelligent actors. From this, the earliest philosophy of the lowest savage, it is a long way to the philosophy of science, and there have been many stages. That hollow dome, the firmament, has become infinite space; the wind, that was at first believed to be the breath of beasts stationed at the four corners of the earth, has at last become the circumambient air in motion under physical laws; the flat space of earth has become a globe; astrology has become astronomy; alchemy has become chemistry; witchcraft has become medicine; beast gods have become domestic animals; and nature gods have become energies that can be used as the servants of man. The history of these opinions and of the philosophies into which they are woven is now a theme for the investigation of many men.

"So the members of this society are prosecuting investigations in the realms of motion, life, and mind; and there is such a division of labor that every great science included in these realms has its devotees. It is a goodly work, it is a grand work."

* From the address of Major J. W. Powell, Director of the United States Geological Survey, delivered as President of the American Association for the Advancement of Science at the Cleveland meeting, August 15, 1888, as reported in the *Electrical Engineer*.

WE have received from Mr. W. H. Mowrey, photographer, Milford, Mass., a couple of instantaneous photos. of railway trains stated to be moving at the velocity of 40 miles an hour. The details are excellent and the pictures very pleasing.

Correspondence.

The Barnard-Brooks Comet.

To the Editor of the Scientific American:

The comet discovered by Barnard, September 3, was independently discovered by me the next morning, September 4. My discovery was promptly announced by telegraph the same morning to Dr. Swift, of the Warner Observatory, Rochester, the news of Barnard's discovery not reaching me until this morning, twenty-four hours after my telegram of discovery was sent.

The comet is near the head of Monoceros, and is only visible in the early morning sky with good telescopes.

It is rather faint, round, with some central condensation.

WILLIAM R. BROOKS.

Smith Observatory, Geneva, N. Y., Sept. 5, 1888.

Electricity in the Blacksmith Shop.

To the Editor of the Scientific American:

I wish to suggest through your valuable paper an easy and, I believe, novel means of testing the condition of horses' feet.

Take a battery or magneto machine, one that gives a light current, say such as can only be felt with moist hands. Attach one terminal to the animal's bit, the other to the shoe. If the horse suffers from the shoe or nails, he will squirm under the test. If there is no irritation, it will pay no attention to it. A little electrical science in the blacksmith shops would locate much suffering.

J. C. HENRY.

San Diego, Cal.

An Insect Cloud in New York.

To the Editor of the Scientific American:

The people of Watkins and vicinity have just witnessed a very curious phenomenon. Commencing at about 4:50 P.M., and continuing nearly an hour, a storm of small insects resembling winged ants swept through and over the valley in such dense clouds as to obscure, to a great degree, the bright afternoon sunlight, and drive pedestrians from the streets to the shelter of their homes, where windows and doors were tightly closed to shut out the intruders. The storm swept rapidly northward, against a brisk breeze, and long after the main body had passed, dense but detached swarms could be seen high in air, hurrying in the same direction.

D. T. SLAUSON.

Watkins, N. Y., September 9, 1888.

The Canals of the Planet Mars.

To the Editor of the Scientific American:

I have read with some interest the paper in the SCIENTIFIC AMERICAN SUPPLEMENT of September 8, from *Science*, written by William H. Pickering of Cambridge Observatory, Mass., on the physical aspect of the planet Mars, but I think his argument in regard to the matter of the vegetable canals (?) is very weak, and to my mind he makes an absurd suggestion in regard to the possibility of these lines not being water canals. He states: "If the canals be artificial, why fill certain of them up every year, later to be reopened? Think of the labor involved covering over and then reopening a canal say 60 miles wide by 3,000 miles long, and all in the space of a few weeks." As Mr. Pickering is not an engineer, it probably does not occur to him that it may be easier to draw the water out of a canal than to fill it up, as he seems to think is necessary. This could be done in a few weeks without any trouble by the inhabitants of Mars, and when the canal was dry, it would not be visible from the earth. Again, when the water at certain seasons was let into the canal again, it would gradually reappear. This would seem to be a simple manner to account for the appearance and disappearance of the canals, and somewhat more practical than Mr. Pickering's idea that they would have to be filled up every year.

I should seriously object to contract to fill up a canal 60 miles wide and 1,000 miles long in three weeks, and I don't believe there are any contractors on Mars who would undertake the job; but to open a gate and let the water flow out is not such a serious undertaking, and would appear to produce dry land in a much more inexpensive manner than Mr. Pickering's method (which I trust is not patented).

RUSSELL THAYER. C.E., M. Am. Soc. C. E.

Philadelphia, September 7, 1888.

Silver Alloys.

Pure silver is a metal of only an inferior degree of hardness, in consequence of which silverware manufactured from the pure metal would be subject to rapid wear, and for this reason it is generally alloyed, except for articles for the chemical laboratory. Silver is more frequently alloyed with copper, besides this it is also alloyed with gold and aluminum. Alloys containing silver and nickel, or silver, nickel and zinc, are much employed in the manufacture of tableware and articles *de luxe*, which, while being of a handsome white color, are much cheaper than those from silver and copper, which was formerly much used in the manufacture of silverware.