

Reclaiming Sterile Land in Germany.

The value of agricultural land in the consular district of Mannheim, Germany, is unusually high, says Consul Hoffman. The holdings per capita are small, and owners are consequently compelled to plant remunerative crops, reserving only sufficient ground for the cultivation of food products and forage for cattle. An interesting illustration in the attempt to retain, or even increase, the arable surface is at present to be observed two miles east of the city.

The valley of the Rhine is about 20 miles across at this point, the lower or river terrace consisting of agricultural lands exceedingly rich in loam and old river deposits, while two miles east of the river the second terrace rises to a height of about 40 feet, most of which consists entirely of fine sand, covered at various places by a thin film of loam and now used for the training of pines. Passing through several miles of artificial forest, one emerges to find better soil and ordinary farm lands used for raising wheat, oats, potatoes, and carrots.

The removal of the edge of the above-mentioned sand terrace was begun early in the spring, the material being transported by cars over a temporary track. The sand is removed by means of specially constructed dredges, and at this time of writing about 6 acres have been exposed, reducing the surface to the level of the farm lands on the lower or river terrace. The top crust of loam has been carefully removed from the sand terrace and carried down to the newly exposed surface of sterile river gravel to form new acreage, being there distributed and having a depth of about 6 or 8 inches. Over a great portion of this new surface young cabbage plants are growing, and other crops will be started as rapidly as the loam is deposited and leveled.

This illustration is but one of many showing rigid economy among these hard-working inhabitants.

THE SURPRISE PEN.

Our engraving shows a very clever trick pen which would tend to create great surprise among the uninitiated. Let us suppose that a gentleman is seated at his desk and is busily writing when a neighbor comes in and he jokingly challenges the latter to try and forge his signature. He hands the pen to his friend, who attempts to write. Immediately there is an explosion and the paper receives a big ink blot. The writer is apt to be surprised by the report, which is like a pistol shot, and if a timid person, is apt to be frightened. The noise comes from the pen itself, as it is so constructed that it can be loaded and shot off at will. The person in the secret can handle the pen with safety, but the poor unfortunate will experience a rather unexpected shock to his nerves when he attempts to write with it.

The upper part of the penholder, into which an ordinary writing pen is thrust, works on a pivot about half way down its length. This separate part is provided with only one-half a bottom, in order that it may engage the conical head of a piston rod which ends in a plunger which sets off the cap secured in the bottom of the penholder. The normal position of the plunger is against the cap of the holder, but it can be raised by means of a projecting pin riveted to the rod and passing through a slot cut in the side of the lower part of the holder. Now the closed half of the bottom of the pivoted end enters a notch caused by the conical head of the plunger, and the plunger with its spring is cocked, as it were, by means of the projecting pin, and is held in place by the bottom of the pivoted section. When the pen is pressed to the paper the pivoted section swings on the pivot, releasing the plunger, which is forced down on the explosive cap by the spring.

The lower end of the penholder is threaded, so that it can secure the end cap firmly in place. The explosive cap is put in the end cap, and it is screwed on the bottom of the holder. Ordinary paper caps for children's pistols are used. As long as the plunger simply rests on the cap there is no danger of an explosion, but just before the joker wishes to give his friend a scare, he cocks it by pushing the plunger up with the pin, until the pivoted top engages it.

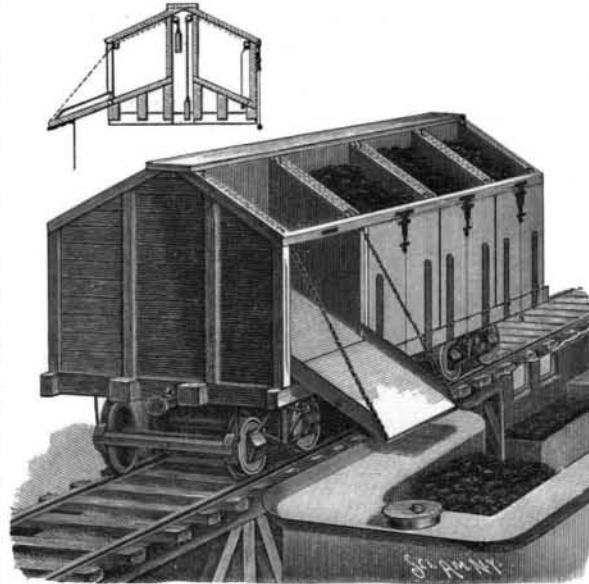
Toning Muddy Platinotypes.

Workers in platinotype find to their cost that damp paper, or paper printed without proper precautions in damp weather, gives dirty-looking, muddy prints. These, however, may be recovered, and gain a splendid blue-black tone if spread over with glycerine, and a little gold solution be poured on, to be rapidly and evenly incorporated with the glycerine with the aid of a swab of cotton-wool. The change in tone is rapid

and marvelous, and a wash to free from (the auriferous glycerine completes the process.—M. E. M. D. in Photo. News.

A NEW WAY OF COALING LOCOMOTIVE-TENDERS.

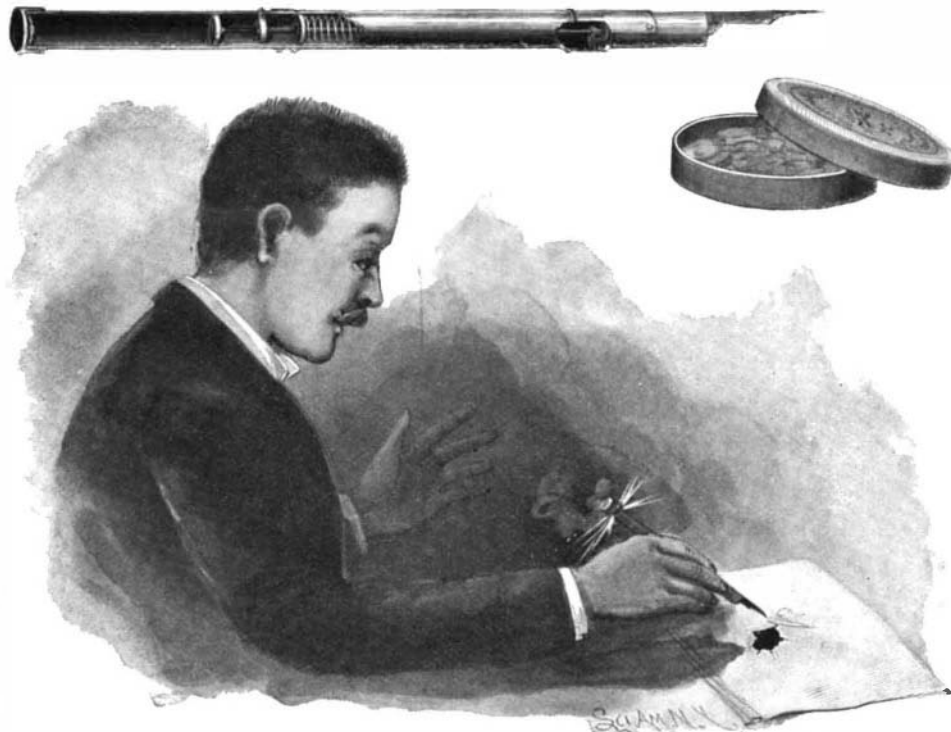
At regular intervals along their lines, the various railway companies have established coaling stations for their locomotives, to which stations coal is conveyed in cars and unloaded. When coaling an engine at these stations large iron buckets are loaded by hand, hoisted by a crane and then lowered into the tender. The expense and labor incurred in this process



AN IMPROVED COAL CAR.

are considerable, and the coal itself is often wasted by this repeated handling. It is the purpose of an invention recently patented by M. J. Griffin, General Yard-Master, and W. P. Hogan, Car-Foreman of the Grand Trunk Railway at Island Pond, Vt., to overcome these difficulties.

The invention in question consists in dividing a car into a series of pockets having sloping bottoms discharging toward the outer sides of the car. These pockets are closed by doors or chutes which can be raised or lowered, and used to discharge the coal into the locomotive-tender. The partitions forming the pockets are made double, with a space between the parts to receive the sides of the doors or chutes. When closed, the doors are locked in place, each by a catch comprising a slide held in engagement with a staple by means of a spring. A rope attached to the lower part of the slide permits the doors to be readily unlocked. The doors are raised and lowered by ropes carried over pulleys through the space in the double partitions, and up on the under side of the foot-board. Counterweights are attached to the ropes, and move vertically in a longitudinal well



THE SURPRISE PEN.

or chamber, as indicated in the cross section. In using the car an elevated track is provided, running parallel with that occupied by the locomotive. When the engineer desires to replenish his coal supply, he runs alongside of the elevated track with the tender of his engine beneath one of the pockets in the car. The catch of the door or chute being then released by pulling upon the rope, the door falls and the contents of the pocket are discharged into the tender. Locomotives can in this manner be coaled from both sides of the elevated track without causing any delay and without incurring any great expense.

Trade on the West African Coast.

The methods of trading on the west coast of Africa have changed very little in the last fifty years, says The New York Sun. There is much improvement in communication with civilized countries, but the natives themselves are the same old "heathens who in their blindness bow down to wood and stone." The climate has a great deal to do with this, and the always hot and malarious country makes great activity impossible. It is only when we read of possible international complications, caused by the traders of one European country encroaching upon the ceded rights of another, that we find that the trade is worth fighting for. This is notably the fact just now on the Upper Niger, where the French traders and the English representatives of the chartered Royal Niger Company have differences to settle. The French traders used formerly to confine their attention to their own settlements in Senegal and other minor places, and for some years they have had a railroad in operation in the region of the Gambia River, but lately their merchants have been more progressive and are vying with England and Germany for prestige in numerous coast ports. There is now telegraphic communication right down to the Gold Coast, and it promises to be continued down the west and southwest coasts until it reaches Cape Colony and forms a belt connection with the telegraph up the east coast of Africa.

From the old days when Liverpool and Bristol vessels indulged in slave trading as a side issue until quite recently, smart brigs and schooners would go out to the coast with a cargo of merchandise, and the captain would be both trader and navigator. He would visit a number of small places and barter his cargo on board his own ship for palm oil and small quantities of ivory, gold dust, and other native produce. Often the voyage would occupy a year or more, and each vessel would take, besides her crew, coopers and mechanics to assist in the loading. It is said that often a cask of salt, which might be worth \$5, has been exchanged for a cask of palm oil worth \$150; but that was long ago.

The trade has long ceased to be so lucrative, and though business is still conducted by bartering spirits, tobacco, cotton goods, and a thousand and one other things for produce, it is very rarely that a vessel will trade on her own account. There are several lines of mail steamers that go down the coast from European ports, and the merchants have trading stations or "factories" ashore where they receive merchandise from the mail boats, and dispose of it for produce which they prepare for home shipment. On the northwest coast, in the region of the Gambia River, ground nuts—in reality our peanuts—are cultivated and shipped from the principal port, Bathurst, to Europe, and are there crushed and a valuable oil extracted.

Going south, the next port of importance is Monrovia, the capital of the little republic of Liberia, called often the American colony. Further south again comes Sierra Leone, a large town, and civilized in comparison with many other places; in fact, it is compulsory to wear clothes on its streets. The Sherbro River is hereabout, with its numerous trading stations, and from this vicinity large quantities of palm oil and palm kernels are shipped.

Again going south, or rather east, at this point, one comes to Lagos and the Gold Coast, with Cape Coast Castle and Accra as important military stations. From this district a quantity of gold and ivory is received, and in many places rubber and small quantities of cotton. Further down still, the ports of Bonny and Akassa, at the mouth of the great Niger, are depts where large hulks are anchored to receive merchandise and produce, either from or to the branch steamers that run up the great river. An enormous trade in palm oil is done up the Niger.

As one goes south, Gaboon, another French settlement, is an important point, and here and further south still rubber is taken in large quantities and shipped to Europe, where it vies in quality with the fine South American products. The Congo River is becoming very productive, and down in this part of the coast the climate is much more endurable; in fact, if you go still further south to the Portuguese settlement of St. Paul de Loanda, the country is healthier and the climate good. Lately the merchants are trying to cultivate cotton and jute, and the latter takes very kindly to the soil, and promises to rival the best qualities of the East Indies. Palm oil is not so valuable as it used to be, the low price of cottonseed oil and tallow affecting it very considerably. It is used principally in the manufacture of soap and candles.

It takes thirty-seven specially constructed and equipped steamers to keep the submarine telegraph cables of the world in repair.