

SOME APPARATUS USED BY THE VIENNA FIRE DEPARTMENT.

A model fire department, which is well organized and under strict military discipline, is the pride of every large city, and Vienna is no exception to this rule. We publish herewith engravings of some of the apparatus employed by the Fire Department of that city. (For which we are indebted to *Ueber Land und Meer*.) According to the laws of the Fire Department of Vienna, not more than one minute must elapse between the sounding of the alarm and the start from the engine house. This promptness in responding to a call constitutes the great value of such a department, for it is all important that the men and apparatus should be on the ground before the flames have gained much headway. In Vienna, as in other large cities, there is a central station, and, besides this, branch stations in all the different districts of the city. In many of the streets there are public alarm boxes which can be made to operate by pressing a button, and large public buildings have their private fire alarms. The telephone has been much used for this purpose of late, and watch is kept over a large part of the city from the towers of St. Stephen's Cathedral.

The Fire Department of each city has its characteristic features. In Vienna the approach of the engine is announced from afar by long-drawn blasts on a horn, and almost involuntarily the step of the passer is arrested, while all vehicles get out of the way as soon as possible. A few seconds later the engine rattles past, drawn by strong horses, which are driven at a rate of speed forbidden to all other vehicles on the streets. A slight investigation is usually sufficient to make the situation clear to the inspector, and a few seconds later powerful streams of water are thrown on the raging element.

The men fight bravely, and if a human life is in danger they unhesitatingly risk their own in their efforts to save it. With the modern buildings which are constantly climbing higher, the danger of the occupants from

fire is greatly increased. If the staircase burns and the firemen see that the escape of those in the upper stories is cut off, they rescue them by means of an almost endless ladder which can be extended so as to reach to the highest windows. But sometimes it is too late to use the ladder, and the frightened people stand at the windows, imprisoned in their own dwelling by the fire. The flames have crept close behind them and their only means of escape is by jumping to

the ground, where ten or twelve firemen have stretched a strong fabric which greatly lessens the force of the fall. Sometimes there is even greater danger (fortunately these cases are very rare) from a fire which has been discovered after the smoke has already stupefied the sleepers in their rooms; their rescue would be impossible were it not for the devices which have lately been adopted for emergencies of this kind and which are different from anything in use by our fire departments.

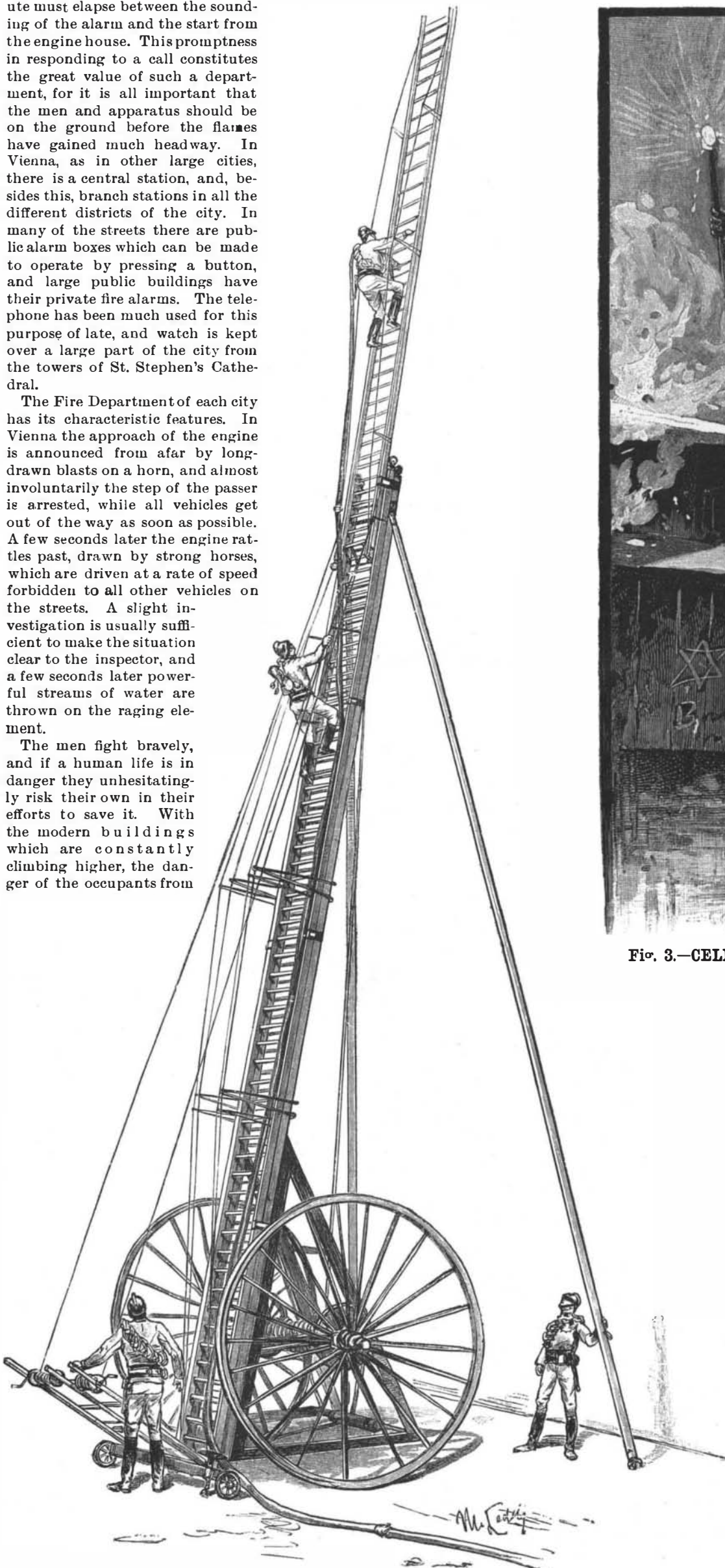


Fig. 1.—THE EXTENSION LADDER.

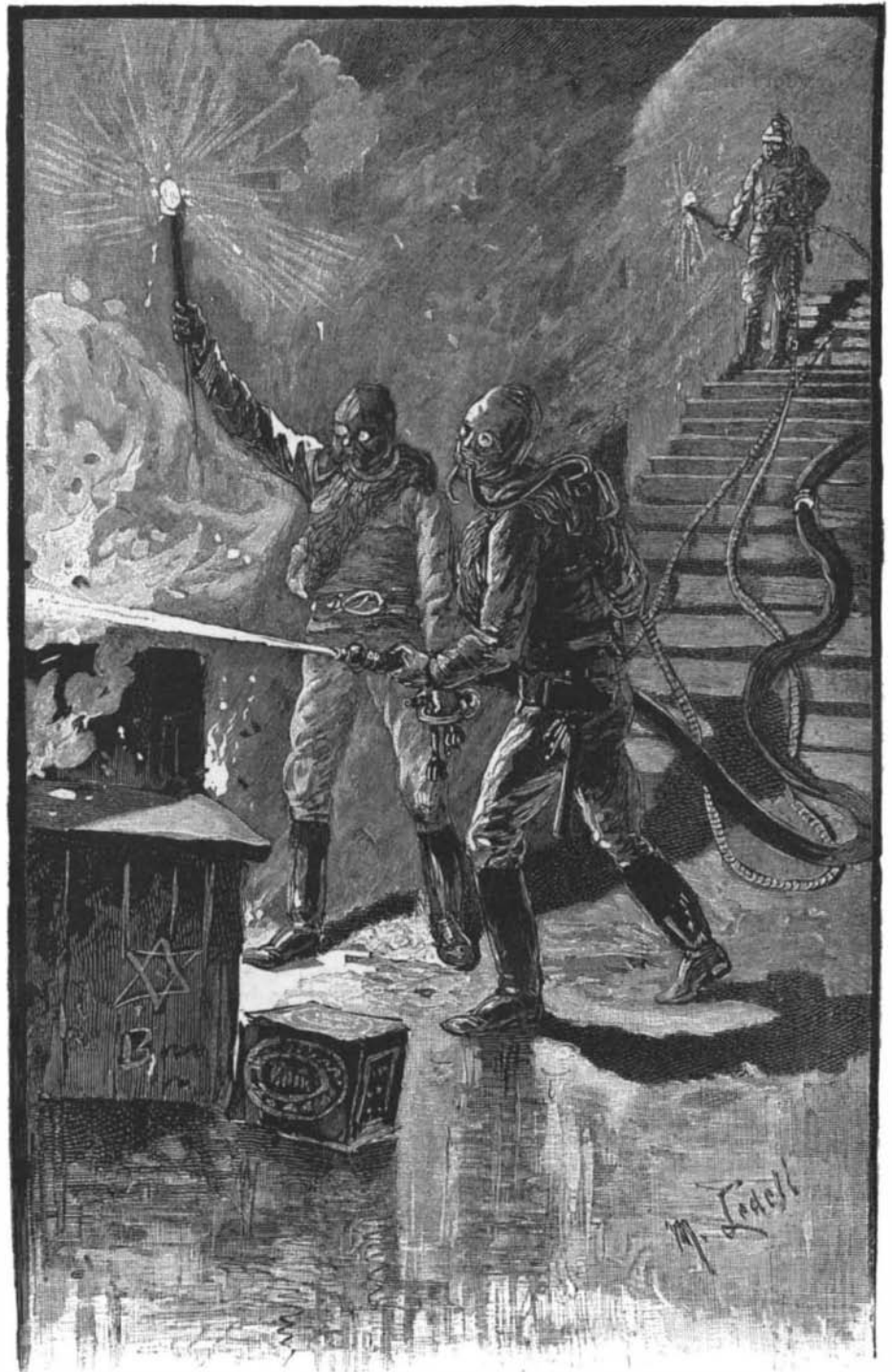


Fig. 3.—CELLAR FIRE—FIRE MASK AND ZINC FLAMBEAU.

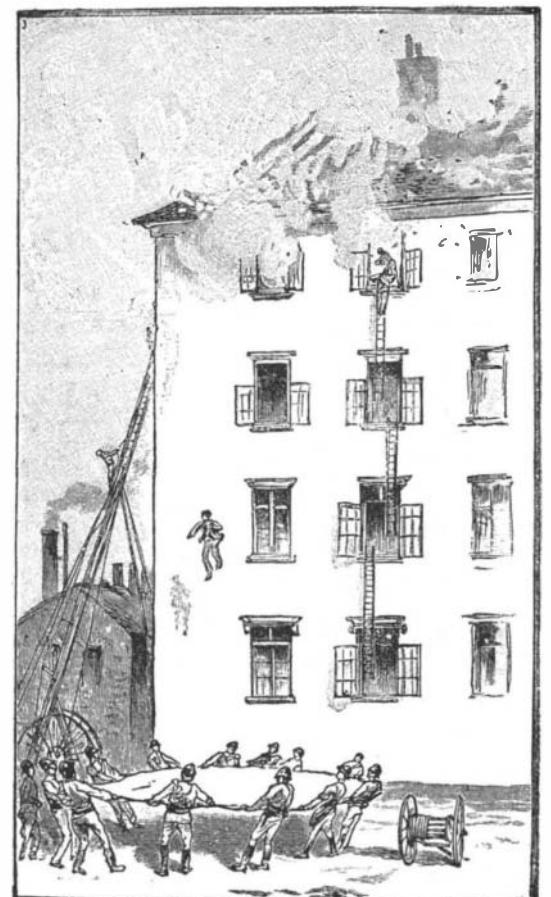


Fig. 2.—THE CANVAS.

These consist of the so-called diver's suit and the fire mask, with which the fireman is able to make his way into a burning building in spite of steam and smoke, and sometimes to save those who have been given up as lost. The danger of suffocation is greatest where the fire occurs in the cellar, and in such cases even the firemen have to use the utmost caution. The smoke often collects in masses which would extinguish any ordinary light, but the zinc flambeau invented some time ago by Chief Inspector Stritzel works very well under these conditions.

THE TYPE-WRITER A FRENCH INVENTION.

Heretofore the earliest invention of type-writers has been attributed to the English, and the first working machine showing the pot of letter levers striking at a common center was supposed to be of American origin. But the French appear to stand first in this respect. In 1833 a French patent was granted to Mons. Progrin (Xavier), of Marseilles, for a type-writer, which he called a Typographic machine or Pen. It is engraved and described in *Brevets d'Invention*, vol. 37, First Series, plate 36. We give an engraving of the drawings. All of the figures in the original patent drawings are probably not given, but we present all that are published. The description refers to a number of parts not represented in the published drawings, and hence the account of the machine is somewhat obscure. Still enough is given to show that the machine was an operative one, by which type-writing could be well executed.

Instead of having the paper rendered movable and the machine stationary, as in the modern style of machines, our French inventor held the paper fast and flat, and moved his machine over the surface of the paper. With this device he not only executed type-writing, but also wrote music and made printing plates. The following is an abstract from the inventor's specification:

This typographic machine or pen serves: 1. To print almost as rapidly as one can write with an ordinary pen. 2. To form stereotype plates for the use of ordinary presses. 3. To copy music or to form stereotype plates of music.

s are metallic levers which rise obliquely around the plate, *n*, and terminate in a fork at their lower end, which takes the shank of the hammer to raise or lower it at will. If one of these levers is pressed, it pushes the shank of the hammer over which its fork passes, causing it to be inclined like the radius of a circle.

When this shank is thus extended on the plate, the hammer remains in a vertical position on the paper, where in falling it has imprinted its figure; the number of levers is equal to that of the double alphabet and the rest of the characters of printing. Each lever corresponds to one of the signs drawn on the plate, *n*, so that, if it is desired to form any letter in the center of the opening, *k*, it is only necessary to find the letter on the plate, *n*, and press lightly on the lever near it, and immediately it will be seen formed on the paper in the center of the opening, *k*, then the plate, *q*, is moved the distance of one notch, a finger is placed on another lever, which is caused to descend and strike its hammer beside the other letter, where it imprints the letter which it carries; thus the same operations are repeated and words and lines of printing are formed. We have explained how it is necessary to push the plate, *q*, one notch for the space of the letter to be printed, and two notches after the letter has been formed to obtain the space for a capital letter or for the distance between two words; as the center of the opening, *k*, must necessarily follow, in a straight line, the movement of the plate, *q*, it should always trace a straight line of printing by means of all the characters which their hammers print successively thereon.

OPERATION OF THE TYPOGRAPHIC MACHINE OR PEN FOR PRINTING.

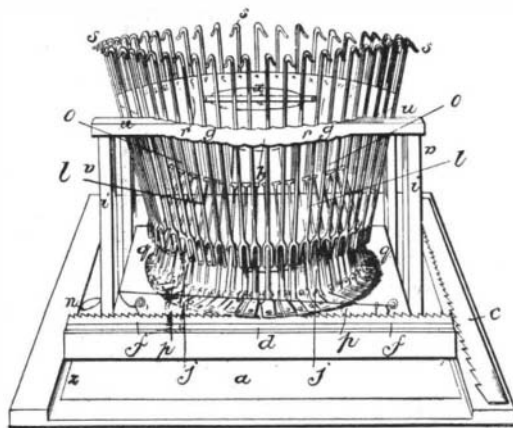
After having placed the body of the machine at the entrance of the frame, *b*, so that the center of the plate, *q*, is beyond the upright of this frame, the letter which is to commence the word of the first line is sought on the plate, *n*, and then the lever which corresponds to this letter is pressed lightly with the right hand; this lever, in moving downward, imparts all its movements to its hammer, so that if it moves down, the hammer falls with force in the center of the opening, *k*, and there impresses, on the paper, the letter or sign which it bears; the lever is then promptly raised, and the hammer follows it, to give place to another, which, by the same operation, will impress its letter beside the first one, after care has been taken to push the body of the machine lightly with the left hand, provided that the springs, *f*, pass from one tooth to another of the notched plate, *d*. This movement, as we have said, marks the distance of the small letters, a double movement marks the distance of the capital letters or the space between two words.

When the first line of printing is finished, the strings, *y*, are pulled with the left hand, which removes the

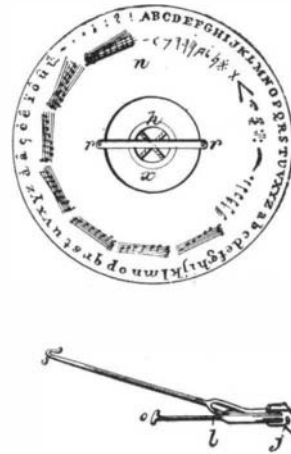
springs, *f*, a little from the plate, *d*, allowing the body, *v*, of the machine to slide back easily to the place for commencing a second line; but, in order to mark the distance between this line and the preceding one, the frame, *b*, must be pushed the distance of one notch, which frame supports the body of the machine; by this movement the center of the opening, *k*, is always found at the proper distance from the preceding line.

When a page has been printed, the frame, *b*, is made to slide back to the point indicated for the commencement of another page. This movement is facilitated by drawing lightly on the string, *n'*, which removes the spring, *e*, from the toothed plate, *c*. Each hammer, in moving down to the center of the opening, *k*, strikes against the pad, *h*, and is thus charged with ink. This pad can be removed when it has not sufficient ink. Then, before replacing it, it is rolled on a plate covered with a coating of ink. It is thus charged sufficiently to supply the hammers during the printing of two or three pages.

When the machine is to be used for forming stereotype plates, the hammers and half of their shanks are replaced by others which are considerably thicker; these latter hammers bear, in intaglio, the letters which are in relief on the others; then, in place of paper, you place on the frame, *a*, a plate of soft metal, which is 6 to 8 twelfths of an inch thick; it is cast in a mould which leaves one of its faces marked with furrows between two ridges; the furrows are of a width corresponding with the space between two lines of printing; on the projecting parts or ridges the hammers strike, leaving the imprint of the figures which they bear, in relief. The method of thus forming letters, words and lines in relief is the same as that which we have described for printing; that is, you look, in the same manner, on the plate, *n*, for the letter which you wish to form, and then you press lightly on the



A FRENCH TYPE-WRITER, A. D. 1833.



corresponding lever; and then the letter is immediately formed in relief on the metal. A stereotype plate can thus be formed very promptly, ready for use on ordinary presses; after it has been used for making the desired number of copies, it is again melted in its mould to be used in forming a new stereotype plate.

In order that the typographic machine or pen may be used for forming the signs or figures of music, the hammers with half of their shanks are removed. This half of the shank is replaced by another, longer or shorter. It is then given a hammer bearing, in intaglio or relief, one of the signs of music corresponding to a like sign which is drawn on the plate, *n*, opposite to the lever which holds and causes the movement of the said hammer. This difference in the lengths of the shanks of the hammers permits of forming the rising and descending gamuts, with the difference of notes and signs, without being obliged to push the body, *v*, of the machine up or down, to right or left; for only the same movement is made which is used in printing. When the notes formed on the end of each hammer are in relief, the machine is used for printing or copying music. When the same notes are intaglio, the machine is used for forming stereotype plates of music, by the method indicated for forming stereotype plates for printing.

With a little practice one can write as rapidly with the typographic pen as with the ordinary pen. I have called it typographic machine or pen because it prints by striking. It will give birth to a new art—that of ktypography. I invented this machine about a year ago.

Luxurious Trains.

The following description of the cars composing the Pullman new trans-continental train is taken from the *New York Sun*: The trains consist of vestibule drawing room and sleeping cars, an observation car, a dining car and a composite smoking car. The vestibule composite car is a magnificent affair, and is exclusively for men. A forward end is set apart for baggage. A compartment between the baggage room and the main saloon is fitted up as a barber shop and a bath room. Adjoining the bath room is a cafe. The rear section of the car is a smoking room. The vestibule sleeping cars, of which there are four on this train, are said by

the managers of the Pullman company to be the best examples of their work ever turned out. They each contain twelve sections of two double berths and two drawing rooms. Movable incandescent lights are attached to each section, in order to allow one to lie in a berth and read. In one of these sleeping cars is a bath room for ladies. The dining car, besides containing ten tables, at which forty persons can dine at once, also contains a kitchen large enough to allow four cooks to work at once. An observation car will bring up the rear. The body is an open sitting room, finished in hard wood and furnished with upholstered rattan arm chairs and lounges. Among its conveniences are a writing desk, a large case of selected books, movable tables and an upright piano. But the main feature of the car, and the one which gives it its name, is the deep recess at the end of the car. The platform will accommodate about twenty persons. In the forward portion of this car will be a small office, which will be occupied by a stenographer and type-writer, whose duty it will be to write and mail the letters of any or all of the tourists gratis.

Inventors of Perpetual Motion Machines.

Some of the most ingenious and persistent men are laboring on the hopeless task of devising perpetual motion appliances. Our educational system is in many respects responsible for so much mental energy being wasted upon fallacies. If natural philosophy and elementary mechanics received the attention in common schools that their importance demands, there would be fewer persons pestering their friends to supply funds for the development of apparatus intended to cheat nature's laws. Ignorance of the laws of nature is, no doubt, responsible for the majority of perpetual motion devotees, yet some men who are well educated become pursuers of the chimera. It is frequently difficult to understand the mechanical fallacies that creep over what are otherwise bright intellects. Electricity seems to be deceiving many men and leading them into the belief that by means of this mysterious force more power can be received than what is given. Since the electric lighting and electric transmission of power era began, there has been a great increase in the applications to the Patent Office for protection of what are electrical perpetual motion machines. For years the Patent Office income was considerably augmented annually by the receipt of fees from inventors of perpetual motion machines, but no fees are now accepted from men working on that kind of apparatus. A printed circular is sent to applicants saying that nothing short of a working model would

be received, and as the inventor never gets a model of this kind to work, he can do no more with the Patent Office. A correspondent of the *St. Louis Globe-Democrat* gives particulars of some curious recent perpetual motion cases. Mr. Keely has a good many imitators in a small way. A few months ago a New York lawyer went to Washington with parts of a machine, and had quite a controversy with the office because the patent was refused. He insisted that he had seen the machine in operation, that it was running day after day, and keeping a cider press going to boot. There was no deviating from the rule. The lawyer went back to New York, saying that he would produce the machine. He was not seen again until the centennial celebration lately, when he reminded the examiner of the case and told him how he had been fooled. At the time of making application the lawyer really believed that his client had discovered the long-sought principle. But when he got back to New York and told that the patent had been refused, the client confessed. The perpetual motion was no motion at all. Power was concealed in the cider press. It ran the press, and the press made the perpetual motion machine go too. The inventor had been charging 10 cents admission to see perpetual motion. He had fooled the public and his lawyer, and he hoped to slip through a claim.—*National Car and Locomotive Builder*.

The Care of Dynamos.

Place the oil catchers under the drip of the dynamo bearings, and never allow them to overflow on the floor. Keep the floor of the dynamo room swept clean, so that no nails or other small pieces of metal can be drawn into the armature.

Never use or leave iron or steel tools near the machine, while at work, as these also are likely to be drawn into the armature if left too near it.

Oil cans made of copper or zinc are best for use about electrical apparatus.

Never allow oil to accumulate on the armature or shafts of the dynamo.

When the wires coming out of the shaft to the commutator become bare from cleaning, they should be recovered with kerite or okonite tape, or gum cloth, and shellacked, and allowed to dry for about eight or ten hours before being used.—*Practical Electricity*.