

A HYDROCARBON BURNER FOR STOVES, ETC.

A simple and efficient burner which may be readily applied to various shapes of stoves, and is designed to furnish a great heat at small cost, is shown in the accompanying illustration. Bolted to and extending entirely around the inner side of the stove casing is a narrow flanged ledge, upon which rests the stack, having a curved and forwardly projecting hinged back. Within the stack is an oil box, supported upon a transverse bar suspended by bolts from the ledge, the distance between the bar and ledge being adjustable. The oil box has a central oil chamber in its upper face and vertical flanges around its edges, while a feed pipe extending through an opening in the front of the stove casing bends upwardly through an aperture in the base of the box, the upper end of the pipe having lateral perforations in a chamber beneath the deflector, which fits closely between the flanges of the oil box. The deflector fits within and is bolted to the flanges of the oil box, is open at both ends and on the front side, and is provided with bottom perforations to admit oil, while the lower part of the deflector is completely filled with a wick of closely coiled wire or similar indestructible material, the packing of the wire being designed to facilitate the passage of oil vapor upward through it. A steam pipe with perforations on its sides extends horizontally through the upper rear part of the deflector, just above the wick, and beneath the pipe is a dish-shaped steam pan, designed to throw the steam to the front side of the burner, and catch any drops of water, which will be quickly turned into steam by the heat of the pan. Sufficient oil having been fed to flow upward into the wick, it is lighted and the steam turned on, after which the feed is regulated so that the oil will only pass a little above the bottom of the deflector, the oil being vaporized by the heat of the wick, when the oil vapor and steam are combined in a gas which burns brightly, the flame issuing from beneath the front and ends of the top plate of the deflector. This improvement is designed to be readily fitted to any style of stove casing, and, when located near a flue, chimney, or other air passage, is designed also to afford an excellent ventilator for living and cooking apartments. The parts liable to deterioration are but few, and can be readily replaced without the aid of a skilled workman.

For further information relative to this invention, address the patentee, Mr. Charles E. Cookerly, or Mr. Grant Davidson, of Kansas City, Mo.

THE SYSTEM OF MILITARY DOVECOTES IN EUROPE.

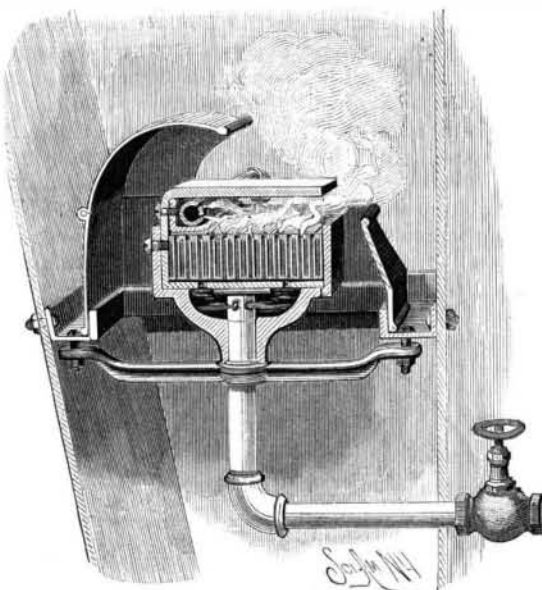
In the organization of the system of military dove-cotes, the locations of the stations are, almost all of them, decided upon in advance. It is a question, in fact, of connecting the fortresses of the frontier with each other and with a central station. There is generally no difficulty with fortresses that are almost always so near each other that ordinary pigeons can easily effect a passage from one to the other. The same is not the case with the central station, at least in great empires, such as Russia, Germany, etc. In this case it is necessary to establish relay stations between the frontier and the center of the system.

One has, in fact, to stand between two dangers, viz., on the one hand, of having journeys to be made that exceed the strength of the average of pigeons, and, on the other, of too greatly multiplying the stations and consequently the loss of time that always occurs at the start, when the bird is taking its bearings, or on reaching home, when it is hesitating to enter its cote. The superiority of communications by pigeons over other methods of transmitting dispatches increases with the distance. Thus a direct train takes thirteen hours to make the 300 miles that separate Paris from Lyons—a distance that can be traversed in eight or nine hours by a pigeon.

It is generally admitted that it is possible, almost to a certainty, to make an ordinary pigeon (such as those with which the military cotes are stocked), provided that it has been carried away, accomplish a journey of from 30 to 90 miles in a single stage, and that, too, in a space of time varying from one hour to four hours. The nature of the country has a great influence upon the facilities of the trip, not only on account of the obstacles presented by chains of mountains, but also by the delays and dangers that pursuit by birds of prey cause the messengers to undergo. A journey of 180 miles over a level country will be more easily made than one of 60 over a hilly one.

So, in the details given further along as to the various systems, we shall see that, by way of exception, it has been possible to carry the distance between two stations up to 180, and even 240 miles.

When stations have to be established upon mountains, it is necessary to install them, not upon the highest points, even though they would thus have the advantage of being discernible, but in the valleys and at the side of the roads, for it is through the necks where these valleys and roads end that the pigeons



COOKERLY'S HYDROCARBON BURNER.

always endeavor to cross chains of mountains, provided the latter exceed the mean altitude of flight.

In certain countries, the military pigeons are carried away only at the beginning of spring, just as are the ordinary carriers, the sole objective of which is contests in the races of autumn. This is an error, for, in time of war, it is necessary that the messengers of the fortresses shall be habituated to brave inclement weather. The Societe Estafette Lyonnaise, this past winter (1890-91), made an experiment in this direction. It lost 43 per cent of the pigeons, but the number of these that arrived permits of the hope that, with proper precautions, this service will enter into practice. Further along, we shall see that what took place at the time of the siege of Paris confirms this favorable opinion.

In every station there must be as many dove-cotes, or at least as many distinct parts of a dove-cote, as there are corresponding stations, so that it shall be always the same pigeons that are carried away in the same direction.

At the age of six months, these pigeons come to know their way so well that, for distances of 120 miles, there is, taking into consideration storms, the shot of hunters, and the claws of rapacious birds, one chance in three that they will reach their destination. In

depend upon six months' old pigeons, whose strength and rearing are generally inadequate, but it will be necessary to have recourse then to pigeons of one, two, three, and even four years, when the journey to be accomplished reaches 240 miles. It will be well at the same time to increase the number of carriers of the same dispatch. As a general thing, it is necessary to employ one pigeon more for each extra 30 miles, so that, for example, for 150 miles we would let loose 5 pigeons of from 1 to 2 years; for 180 miles, 6 pigeons of from 2 to 3 years; for 210 miles, 7 pigeons of from 3 to 4 years; and for 240 miles, 8 pigeons of from 3 to 4 years.

These figures are only approximate, for the value of a pigeon does not always depend upon its age. One that is excellent for service in rainy weather may be worth nothing in a wind, and *vice versa*. It is, therefore, of prime necessity that the keepers of military dove-cotes shall make it a point to know personally all the birds in their charge, and to take note of their aptitude.

The installation of military dove-cotes is about the same throughout Europe. Sometimes they are established in isolated pavilions and sometimes in the upper stories of magazines or barracks.

The cut represents the military dove-cote of Grenoble that I have had installed in the upper story of a tower of the ancient wall built in 1401. Attention should be especially directed to the safety of the birds, which should be carefully protected against the attack of cats, rats, or other carnivorous animals.

Each dove-cote should be provided with several compartments. First, there is the apartment for paired pigeons, in which the birds generally remain when they re-enter the cote. Each pair has its own cage, the height and length of which is twenty inches, while the width is from twenty-four to twenty-eight inches. Two plaster nests are placed in each cage, one of which will serve for the young, while the other will contain the eggs.

Just alongside there should be a second apartment, fitted, or not, with cages. The pigeons are confined in this in the month of October, the epoch at which the males should be separated from the females. A little further along is the infirmary, into which all sick pigeons are put, so that they may not communicate the disease with which they are afflicted to the other birds.

Finally, the entrance cage completes the installation of every dove-cote. Generally, this cage is placed at the window of the apartment for paired birds and communicates therewith. Little swinging wickets allow the birds to go in and out. A bar put in place by the keeper prevents the wickets from moving in both directions at certain moments, and then permits the birds only to enter the cote.

In order to give the pigeons more air, and, at the same time, to allow the keepers to seize them easily, rooms are selected that have a sufficiently high ceiling, and in these are established, at a height of six feet, a second and open ceiling of laths, which prevents the birds from flying out of reach of the hand.

Clay and bits of wood are placed within reach of the pigeons in order to permit them to build their nests. In the interior of the cote there are wooden trays for seeds, and leaden troughs, or small apparatus of special form, for water. The food consists of vetches, beans, and Indian corn. Cereals, hempseed, and a little salt may also be given. The birds complete their ordinary fare by swallowing grains of sand or small pebbles.

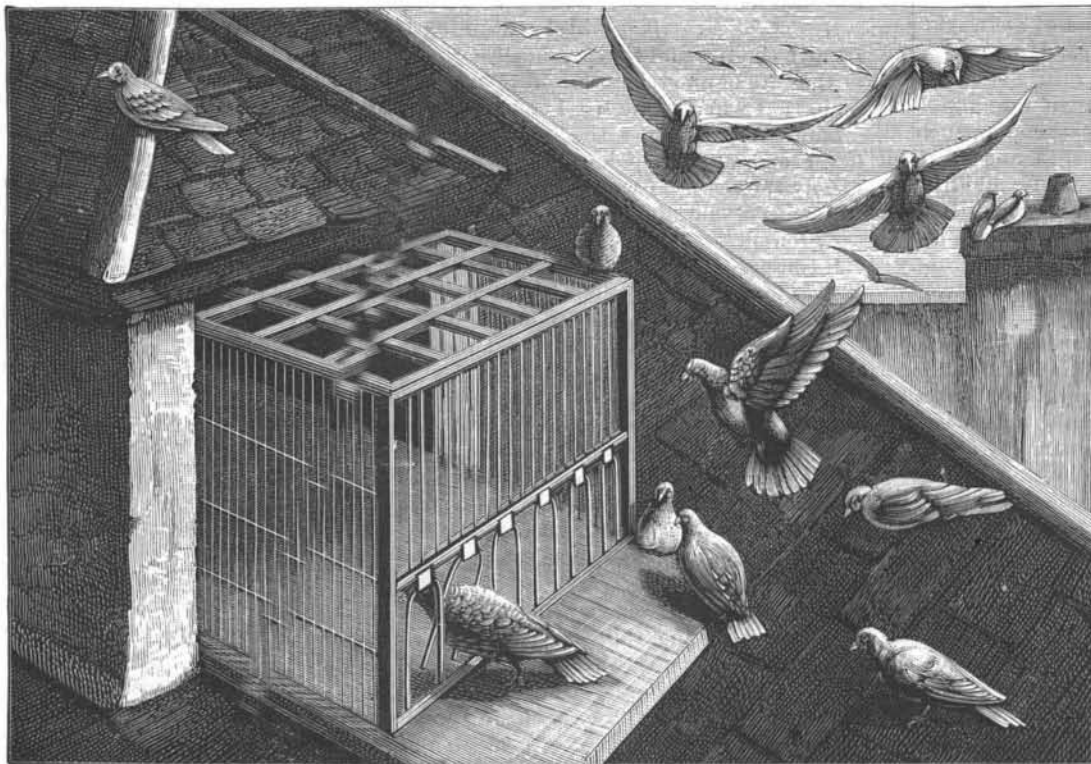
Three meals a day are served to them in summer—one at 5 o'clock in the morning, one at noon, and one at 6 o'clock in the evening. In winter they are fed but twice a day—at noon and at 5 o'clock. It costs from 25 to 30 cents per month to keep each pigeon.

Thus treated, the birds reach their complete development in three years, and are capable of performing good

service as messengers until the age of fifteen or sixteen years. They have been known to attain a longevity of twenty years, but it is between the ages of two and six years that they display all their qualities.

For carrying the pigeons away from the military dove-cotes, it is well, the first year, to adopt the following rule:

The distance of a letting loose of the birds will be obtained by adding to the distance of the preceding



ENTRANCE CAGE OF A FRENCH MILITARY DOVECOTE.

order to be sure that a dispatch will be transmitted, it will suffice, then, to confide it to three messengers, or to four at the most, during unfavorable winds or weather. From this it results that if we wish to be able to send a message every day during an investment of six months or 180 days, it will be necessary to have an effective force of 180, by 4, or 720 pigeons for each station with which it is desired to communicate, the distance of such stations being less than 120 miles. If the distance is greater than this, we can no longer