

BULL RUN RIVER POWER PLANT TO START UP AUG. 1

New Plant of P. R., L. & P. Will Be Highest Hydro-Electric Station of Kind in the State.

August 1 the water wheel units in the new hydro-electric power plant of the Portland Railway Light & Power company on Bull Run river will be in operation. Announcement to this effect was made during the week by the company's engineering department to the president B. S. Josselyn. This power project is the one that formed the nucleus for the Mount Hood Railway & Power company, purchased by the old company some months ago and now merged with its properties.

It is claimed that this will be the highest head hydraulic plant of its capacity in the state and that \$2,000,000 is the estimated cost of the entire development of which the power plant is a part. Work on the power house and reservoir was started a little over a year ago under the late Cecil B. Smith, chief engineer and general manager of the Mount Hood Railway & Power company, and the project was turned over for completion to the Portland Railway, Light & Power company engineers about three months ago when the transfer of the Mount Hood company to the old company was officially announced.

Lake of 145 Acres.
For about a year the Little Sandy river, a branch of the Bull Run, will furnish all the water necessary for this development. The dam that diverts the water to the Little Sandy, is located about three and a quarter miles from the Bull Run postoffice. A wooden flume carries the water from this dam to a reservoir located at Bull Run postoffice.

The reservoir site is located in a natural depression diked by a riprapped retaining wall. This 145 acre lake will store 72,400,000 cubic feet of water, which is equivalent to nearly 600,000 horse power of electrical energy. The water in this lake can be drawn down 25 feet in order to give the horse power hours shown above.

In making use of the water in this pond, a concrete intake structure will admit it through 10 foot motor operated valves. These valves are protected by screens now being placed. The water drops 325 feet from the reservoir level to where it is discharged from the turbines in the power plant below.

Huge Stand Pipes.
In passing through the intakes, the water is conducted a distance of 1400 feet down the hillside through two nine foot penstocks. For a short distance these penstocks run through a tunnel and then in trenches held by concrete anchors. Huge stand pipes and surge tanks for protection against water hammer, are installed on each penstock about 450 feet below the reservoir intake. It is proposed to cover these penstocks after they have been tested, as further protection against surges and shocks. At a point about 150 feet back of the power house the penstocks branch in the form of a "Y" making four 6 1/2 foot penstocks that take the water directly to the turbines. The water after passing through the water wheels in the power house is discharged into the Bull Run river.

The power plant is about 150 feet by 45 feet with a 45 foot ceiling. The heavy machinery in the operating room can be handled by means of a 40 ton electrically operated crane. This machinery consists of three water wheel units of what is known as the single runner Francis type and are direct connected to three alternating current generators. The mechanism on each gate is of the latest type, holding the gates open against hydraulic pressure so that in case of accident the central mechanism is tripped and the water wheels stopped.

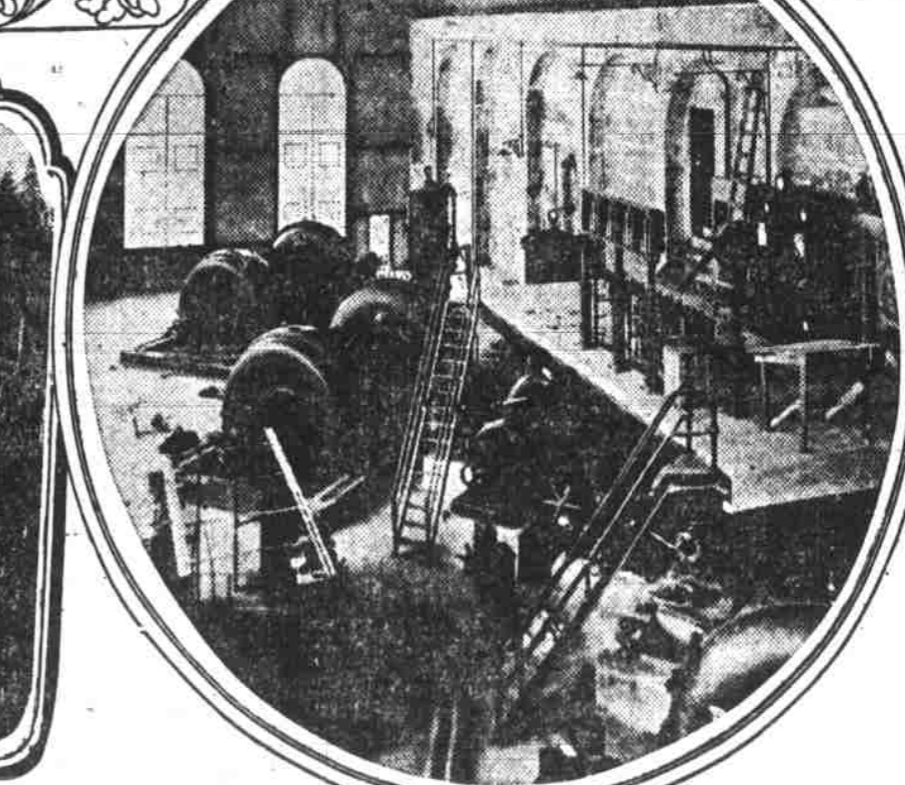
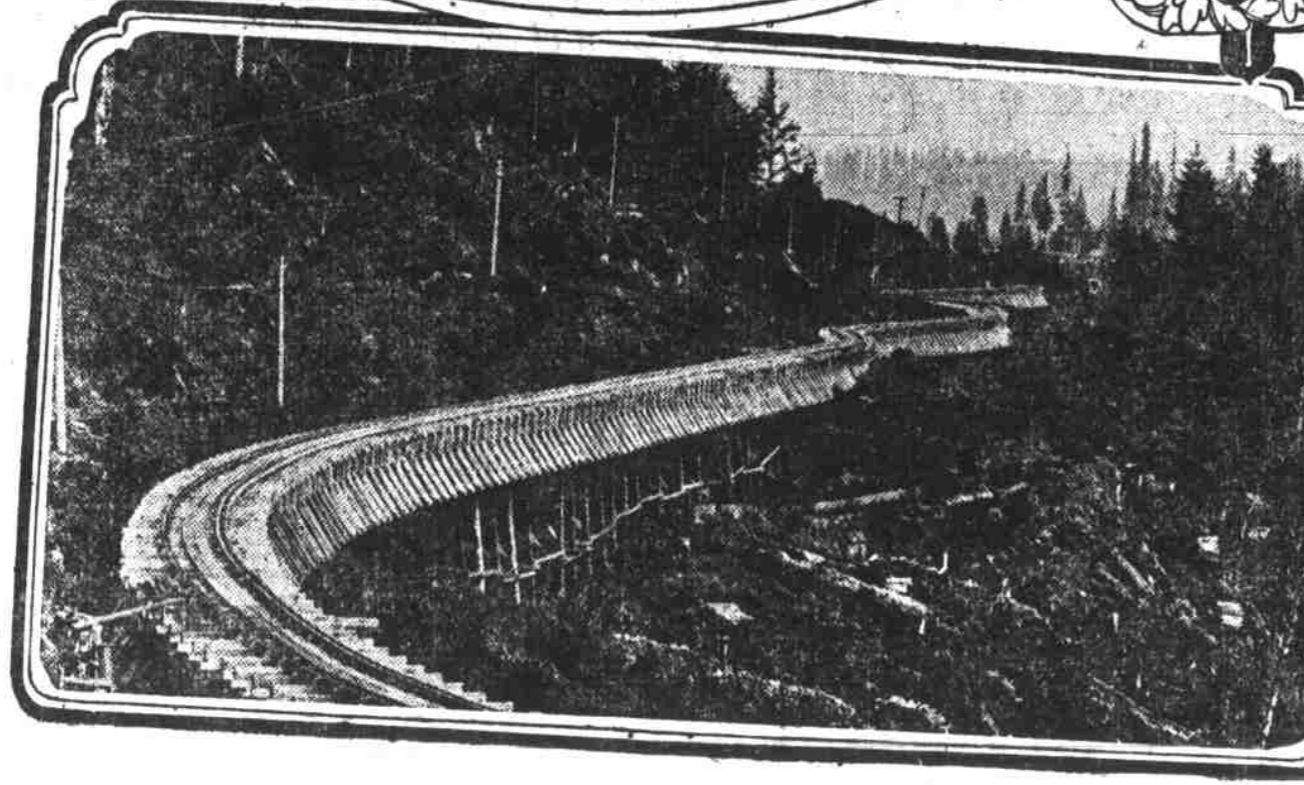
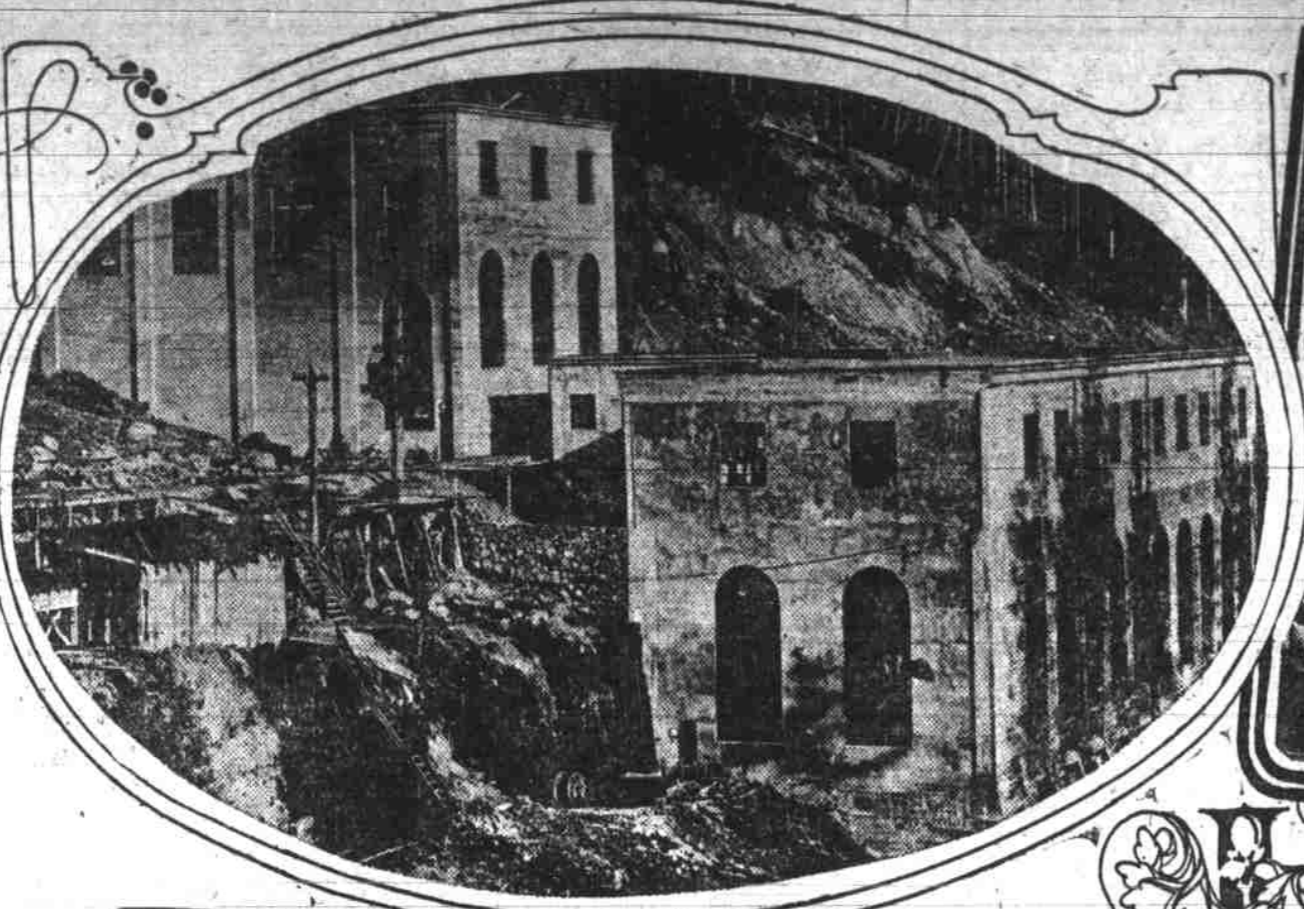
High Degree of Safety.
The mechanically operated relief valve on each unit, together with the complete operation of the latest design, gives a great degree of safety. However, to make doubly sure, there is provided on each penstock a breakneck plate which is so designed that should the pressure by any chance exceed a certain amount, due either to a flood in the reservoir or a condition brought about by a surge, this plate will break and relieve the turbine runners of the increased pressure.

One of the large water wheels was manufactured by the Cleveland, Ohio, company, the Westman-Seaver-Morgan company, while the other two large ones and the two small ones were manufactured by the Platt Iron Works company of Dayton, Ohio, the same people who supplied the water wheels for the Grand and River Mill developments of the Portland Railway, Light & Power company. The smaller water wheels of the five are exciter units and of 300 horse power capacity each, while the large ones are of 6400 horse power each.

Fourth Unit Planned.
The Westinghouse Electric & Manufacturing company of Pittsburgh, has

\$2,000,000 Is Estimated Cost of Entire Development of Which Power Plant on Bull Run Is Part

145-Acre Lake Will Store 72,400,000 Cubic Feet of Water; This Is Equal to Nearly 600,000 Horse Power Hours of Electrical Energy; Machinery of First Unit Will Commence Operating Soon; Large Water Wheels Made in East; 200 Men at Work Building Big Sandy River Diversion.



Top, left to right—Power house and transformer house on Bull Run river; pipes conveying water from reservoir through tunnels to power house on Bull Run river. Lower, left to right—Wooden flume carrying water from Little Sandy river into reservoir at Bull Run postoffice; interior view of power house operating room.

The contract for installation of all the electrical equipment consisting of generators, switchboards, auxiliary apparatus, is planned to install a fourth unit in the early part of 1913.

The interior of the switching room in which is located what is termed the low-tension switching apparatus furnishes interesting study. The current on the copper buses in the cells back of the oil switches will be at a potential of 6600 volts. Back of the switching house and on a higher level is located the transformer house. Here the 6600 volt current is stepped up to a voltage of 60,000 for transmission to Portland. Seven huge transformers, each located in a separate compartment, accomplish the transformation to the higher voltage. On an upper floor of this transformer house are all the high voltage switches and buses.

The buildings that compose this power plant will have a total wheel capacity of 25,600 horse power and a rated generator capacity of 15,000 kilowatts.

Diversion Dam.
As the Little Sandy will not furnish sufficient water to operate the entire plant, there is being constructed on the Big Sandy river about seven miles from the power plant shown, a diversion dam which will divert the water from the Big Sandy through a flume, earth canal and tunnels about three miles to a point on the south side of the Devil's Backbone, where it enters a tunnel that conveys it to the diversion point on the Little Sandy river. From there, together with the waters of the Little Sandy, it is conducted through the Little Sandy flume to the Bull Run reservoir.

When this work on the Big Sandy is completed, there will be sufficient water to operate the plant to its full capacity. At present there will be only enough to operate the plant to about one-third to one-half its ultimate capacity. A force of 200 men is working on the building of this Big Sandy diversion and it is stated that this force will be rapidly increased so as to push the work forward to completion about April or May, 1913.

Commercial Mushroom Growing in Oregon Is Practicable

Oregon Agricultural College, Corvallis, Or., July 20.—Mushrooms, so desirable as a garnish for a tender steak, are not grown so generally as they would be if it were not that so many gardeners have a wholesome fear of "toadstool poisoning." Though there are numerous wild mushrooms which are edible, some of them much preferred to the species usually grown for market, one who wishes to be absolutely safe may obtain the Agaricus Campestris, the kind grown commercially. The color of the gills (the under surface of the cap) is creamy white, turning later to a pink, and in some brown varieties, to a grayish brown, and later still to black.

Prof. A. G. B. Bouquet, the vegetable garden expert of the Oregon Agricultural college, has prepared the following suggestions and advice for those interested in the cultivation of mushrooms.

Why Mushroom Growers Fail.
The cultivation of the mushroom for commercial purposes is a more or less uncertain affair," says Prof. Bouquet. "The common causes for failure are the use of poor spawn or spawn killed by improper storage; spawning at a temperature injuriously high; use of too much water at spawning time or later; and improper preparation of the bed. There is no use trying to raise mushrooms if you do not start right. If the bed does not heat, if the manure was not right, and if spawning is done before the heat is low enough, the heat will kill the spawn."

Where Mushrooms Will Grow.
Mushrooms may be grown in any place where the conditions of temperature and moisture are favorable. A shed, cave, cellar or any vacant space in a greenhouse may be utilized to advantage. The most essential factor is the obtaining of proper temperature, which should range from 53 degrees to 59 degrees, 55 degrees to 58 degrees being best.

The second most important factor is that of moisture. The place should be very damp, although a moist atmosphere is desirable for the best growth of the fungus. In selecting a place in which to grow mushrooms it will be necessary to consider that cold is less injurious to mushrooms than heat. This accounts for many mushroom houses being constructed half below the ground so that there is less trouble in keeping down the temperature. Cold may render the bed unproductive for a time, but heat stimulates the spawn to too rapid growth. The season of the year at which mushrooms are usually grown is early spring and summer, as well as in fall and early winter. They may be produced the year around, however, in properly constructed houses. Light is usually excluded from the mushroom houses, but a little light may be allowed that one may be able to work among and harvest the mushrooms. The color of the product will be materially improved by darkness.

Fertilization of the Beds.
Suitable manure must be used in the preparation of the beds. It must be in the primary stages of fermentation and, if possible, should not contain more than a moderate amount of straw or bedding, or of such substitutes as sawdust or shavings. When the manure is

first obtained it should be piled in a heap three or four feet high, and if it is dry it should be watered slightly so as to start fermentation. In four or five days it should be turned and a second turning is also necessary in seven or 10 days. This is to permit of even fermentation and to prevent it from burning in spots. In 15 days or three weeks the temperature will begin to fall, the fermentation will have been uniformly started and the compost will be ready for the beds.

The Beds and Their Temperature.
It is customary to make the beds about three and a half feet by four feet and 10 to 12 inches deep, with boards on the outside to hold the manure. When put into the beds the mixture should not be wet or dry, but may be moist. The only practical test to be relied upon for moisture content is that of pressure—when water cannot readily be squeezed out the compost is in condition. It may be piled in layers of four or six inches and slightly packed so that there may be a minimum number of air spaces,

and so that fermentation may proceed regularly. After the beds are prepared the temperature will be too high for spawning; it should fall to 75 degrees before the spawn is put in the manure. Beds should never be spawned at a temperature greater than 80 degrees. The spawn which is bought commercially comes in bricks, which are broken or cut into pieces two inches square, making 10 or 12 pieces to the brick. These are put 10 inches apart an inch or so under the surface of the manure. It is usually unnecessary to water the beds after spawning, for water applied to young spawn almost invariably causes it to damp off.

White Threads Indicate Growth.
If the bed is examined about two weeks after spawning and it is found that the spawn is not "running," the difficulty may be with the bed. Failure to grow is indicated by the absence of white threads in the manure about the spawn. "Casing" consists of applying a layer of loam not too heavy or

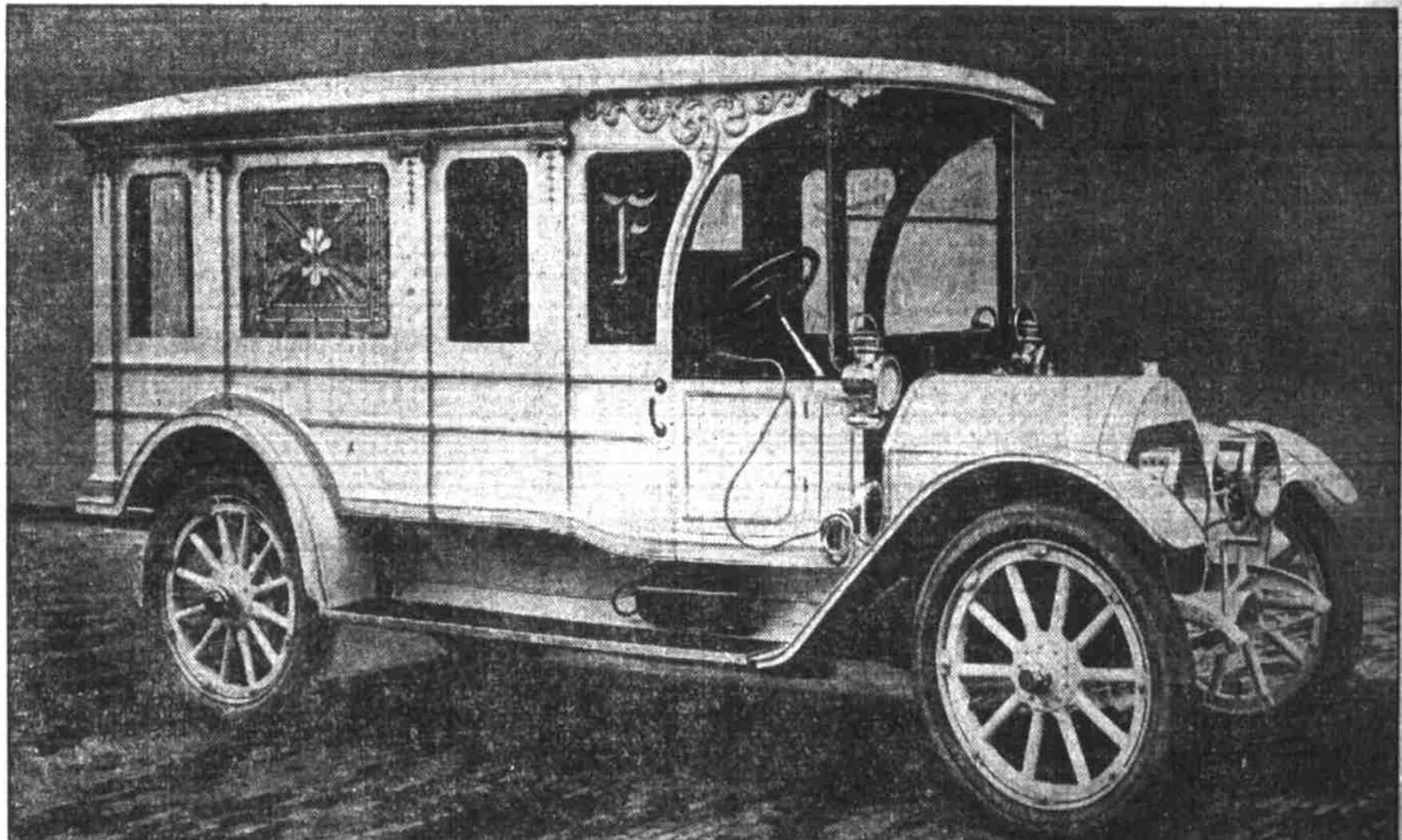
too light, about an inch and a half deep all over the surface of the bed. This should be fine and previously screened, and should be barely moist to prevent the bed from drying out.

When the mushrooms appear the bed may be given a light sprinkling once or twice a week, but they should never be soaked. To have the moist atmosphere in the mushroom house the walks and walls can be watered and kept moist.

Picking the Marketable Ones.
The mushrooms appear usually about six weeks after spawning takes place. Being a fancy article, it is necessary to practice diligent methods of picking and gardening. In picking, the mushroom should be grasped by the cap or by the cap and stem and twisted to remove it easily from the soil. All defective ones should be removed and the small "buttons" also thrown out. Shipment is made in small boxes usually, similar to strawberry boxes, or in cardboard boxes holding two to five pounds. These are often lined with paper to keep the mushrooms in as good condition as possible. The market price averages ordinarily 15 to 20 cents a pound, and sometimes even 75 cents is paid.

Under favorable circumstances a bed will come into bearing within six weeks,

THE AUTO HEARSE IS AN ADDITIONAL EVIDENCE OF PROGRESS IN MOTORDOM



J. P. Finley & Son, Undertakers, First to Use This Modern Vehicle on the Pacific Coast.

Ever a step in advance of the most progressive ideas in undertaking, J. P. Finley & Son have furthered dignity of the profession by several leagues in the introduction of the motor funeral car in this city. Not to be outdone by the leading funeral directors of the United States, among whom this company is frequently mentioned, the car was ordered several months before they were in general use in New York and Chicago. It is now in daily use in this city.

Its quiet running, noiseless operation and pleasing appearance seems to have fitted it, without apparent intention, for the very use to which it has been called. Its serviceability was quickly recognized by J. P. Finley, shortly after automobile ambulances were first used.

The chassis was ordered through the agency of H. L. Keats, while the body was designed and built by a Portland manufacturer. The trimmings, another idea adapted by Mr. J. P. Finley to Portland's needs, are of the character-

istic gray and silver which has done so much to eliminate the somber effect of black. The color effect is not only carried out in exterior decorations, but on the inside as well.

This is the second innovation for which this firm is responsible, in the use of motor cars for their service. The first was a caquet wagon which has been in use for some time. It has proven a success in every way and demonstrated its immense superiority over old methods which are rapidly being discarded by modern undertakers. It is believed that the time is not far distant when carriages will follow the old style hearse into history.

In all the various ideas for which J. P. Finley & Son have received credit, none has received as deserved a praise than the erection of the splendid new edifice at Fifth and Montgomery streets. Here the largest and most complete establishment of its kind on the Pacific coast is being completed. In fact, it would be difficult to find in the great cities of the east, to find a more commodious, perfectly equipped and complete building than this one. Within a few weeks it will be ready for occupancy.

STATE FAIR IS TO COVER WIDE RANGE IN LARGE DISPLAYS

County Exhibits Sure to Be Feature Along With Children's Industrial Work; Special Days Set Aside.

(Salem Bureau of The Journal.)
Salem, Or., July 20.—That the state fair, which will be held during the early part of September, will be unusually good is the unanimous opinion of members of the state fair board.

It is now practically assured that Clatsop, Multnomah, Marion, Coos, Columbia, Clackamas and Benton counties will have county exhibits, besides the many individual and community exhibits from these and other counties in the state. And practically every county in the state will be represented in the children's industrial exhibits.

One of the new features this year will be the eugenic show, for which \$500 has been appropriated for prizes and cups. O. M. Plummer of Portland will have charge of this feature.

Another new feature is the shoot, which will be held Monday and Tuesday forenoons, beginning at 8:30 o'clock. There will be seven events, the first for 10 targets, the second and third for 15, the fourth and fifth for 30 and the fifth and sixth for 25 targets, while an added event for 25 targets will be pulled off if there is time.

Purses for Shoot.
The amateur receiving the highest average for the two days will win a special purse of \$25, the second highest \$15 and the third highest \$10. There will be a \$2 entrance fee and a \$20 purse added by the fair board for each event, which will be divided at the ratio of 40, 30, 20 per cent. Three cents each will be deducted for cartridges.

The board selected J. J. McCarthy of Oakland, Cal., for starting judge for the racing events. He served here two years ago.

It has been announced that the state game and fish commission will have an exhibit of pheasants and special coops are to be provided.

Announcement has been made that the fair grounds will be patrolled by Oregon national guards, if satisfactory arrangements can be made with the guardsmen. It is desired to have them camp on the grounds and take full supervision of the police regulations.

Frank G. Odell of Lincoln, Neb., has been engaged to give free demonstrations each day of the fair.

The board gave consent to loan the fish tanks not in use on the fair grounds to the state fish and game commission which will use them for making an exhibit at the Pendleton fair.

The secretary of the fair board was authorized to advertise for music for fair week to be furnished by union musicians who are residents of Oregon.

Monday, the opening day of the fair, will be Labor Day. Tuesday will be Woodman of the World day, Wednesday, Salem and eugenic show day, Thursday, Portland day, Friday, German societies' day; Saturday, Shriners' day.

and the period of the successful bed will vary from six weeks to three months. Many growers figure a profit in mushrooms yielding half a pound to the square foot of surface, and many report two pounds to the square foot. When a bed has ceased to bear or is no longer profitable commercially, the manure may be taken out and used for garden purposes. It is useless, of course, for the growing of mushrooms again, as all the heat is exhausted. The house may be thoroughly cleaned in anticipation of another crop. Those who wish printed matter on the subject may obtain the Massachusetts board of agriculture bulletin 5, farmers' bulletin 264, "Cultivation of Mushrooms."

The Trouble Hunt.

From the Washington Star.
"Of course," said the observant citizen, "every man is liable to say things which will lay him open to resentment and criticism."

"Yes," replied the energetic candidate, "and I am trying to think-up a lot of them right now."

Have You a Friend Who Drinks to Excess?

Tell Him He Can Be Cured by the Neal Treatment

Many a man who drinks to excess gives no thought to the habit which fills his friends with sorrow and alarm.

They can see his finish. The Neal Institute is a place which has enabled many deserving people to save friends and loved ones by ridding them of the craving appetite for drink.

Three days is sufficient for the performance of what many people look upon as a miracle. Excessive drinkers do not always drink because they really want to drink. Many a slave to the habit has resolved to quit. Again and again he suffers "sworn off," but the torment he suffers attending the effort without the right kind of help takes him back to his old ways.

The truth is that excessive drinkers really are impregnated with the accumulated alcoholic poison, which has been taken into the system too fast for nature to expel it. This accumulated poison is responsible for the craving desire which can

only be temporarily satisfied with more drink.

The treatment is such that it will recommend itself to any one having a friend who drinks, for it is administered along ethical lines.

Business men have gone to the Neal Institute in condition bordering on collapse—nervous drinkers who need "bracers" from morning until night. They have left the institution in 3 days superlatively happy over restoration of nerves and with all desire and craving for alcoholic liquor absolutely gone.

At the Institute guests enjoy all the privileges and comforts of home, club or hotel. Names of patients are never divulged. Home treatment can be given to those who prefer it.

If you are interested in any one who drinks too much and want him to know more about the Neal Treatment for the Drink Habit, write, phone or call at the Neal Institute, 354 Hall street, Portland, Or. Marshall 2400.