

OPEN-AIR ORCHARD HEATING IN COLORADO.

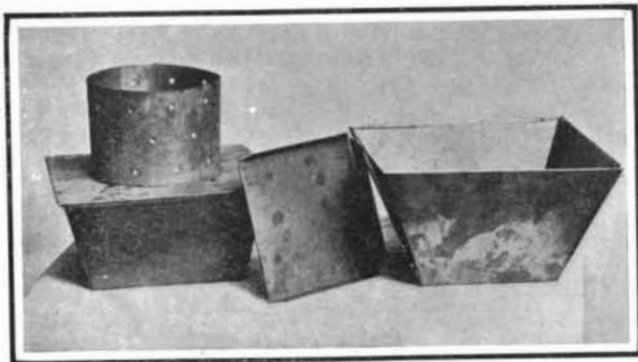
BY W. FRANK M'CLURE.

The 1909 crop of fruit in the Grand Valley in Colorado, from the Palisades above to Loma below, valued at \$3,000,000, owes its existence to a unique battle

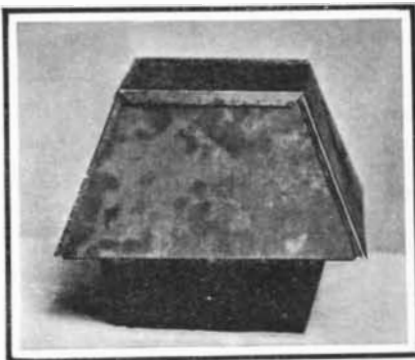
orchards after the manner shown in the accompanying photograph. Oil was carried to the pots in wagon tanks equipped for the purpose. Spraying machines were also used in distributing the oil. A large supply of lighters was kept in readiness in a dry place. Many

assistance. Men worked in shifts, some at night lighting the fires, and others in the daytime filling the pots. Even women assisted in the work. The campaign in all lasted four days.

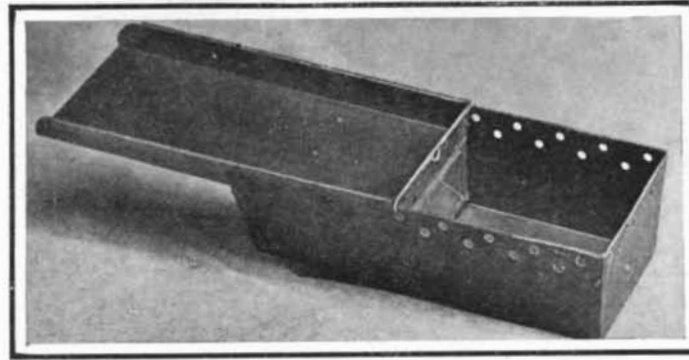
So well did this orchard-heating idea work, that



One of the many different styles of pots used in smudging.



An oil pot with hood in place.



Another type of pot in which oil is used.

which was waged against Jack Frost at a time when the fruit was at its tenderest age. By unusual generalship and the work of hundreds of enthusiastic volunteers, the temperature in these orchards was actually raised eight and nine degrees over 27 miles of territory, and a precedent was established which will mean much to the future. In California it is said that the temperature has been raised heretofore in some single orchards two or three degrees, but never to eight degrees, and never before has the work been carried on over so great an area. Plans are now on foot to have every bearing orchard in the Grand Valley protected by next season, not that there is any likelihood of frost every spring in this section, but because the protection against possible repetition of this year's experience is considered cheap insurance. Representatives of other fruit-growing sections have also recently visited the

of these lighters were made by wrapping waste about a twisted wire.

All operations were directed from Grand Junction. Weather stations established over much of the territory, and equipped with thermostats, when the threatening weather arrived, made half-hourly reports on the temperature to Grand Junction.

Spraying the trees with apparatus which also conveys oil to the pots.

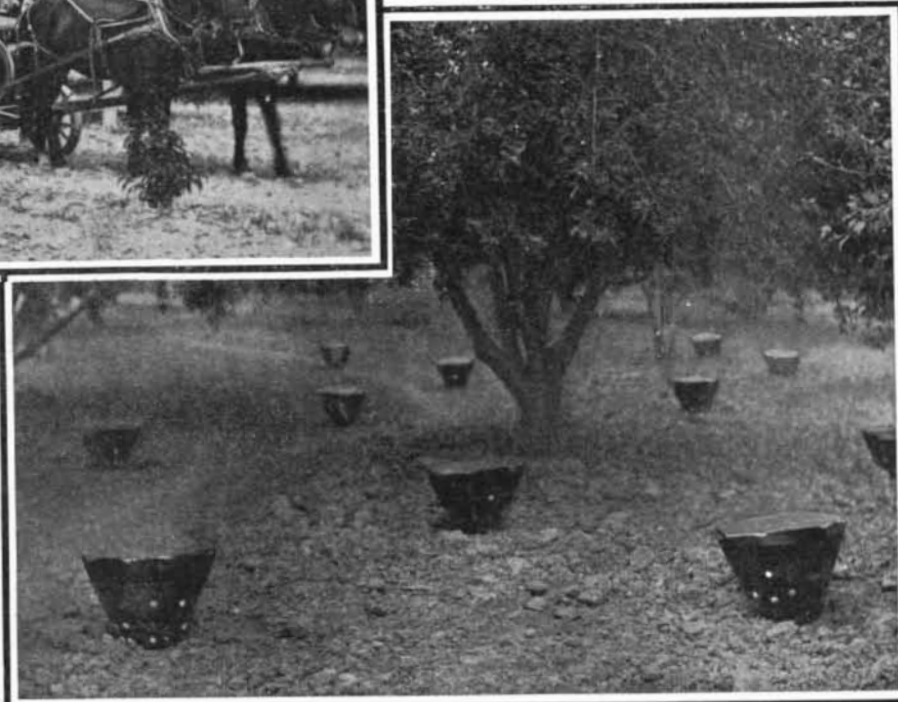


while the temperature outside the heated area dropped as low as 20 degrees, within the heated area it did not go below 29½ deg. Seventy-five per cent of all the fruit trees which were in bloom were cared for directly, while even orchards owned by those who were skeptical of the idea were saved by the fires in the adjoining territory.

As previously stated, there were a great many different kinds of pots used in this work. The number used per acre depends upon the size. Forty, 60, or 80 pots per acre was the average. When coal is used, it is usually lump or nut. With coal at \$4 a ton, some one has figured that it cost him \$4 per acre to heat his orchard for a six-hour run. Some of the oil heaters are used to the number of 60 or 80 to the acre. In the opinion of some, it is better to have a small-sized pot and use more to the acre, say 60 or 80, as just stated.



Raising the temperature in a Colorado orchard.



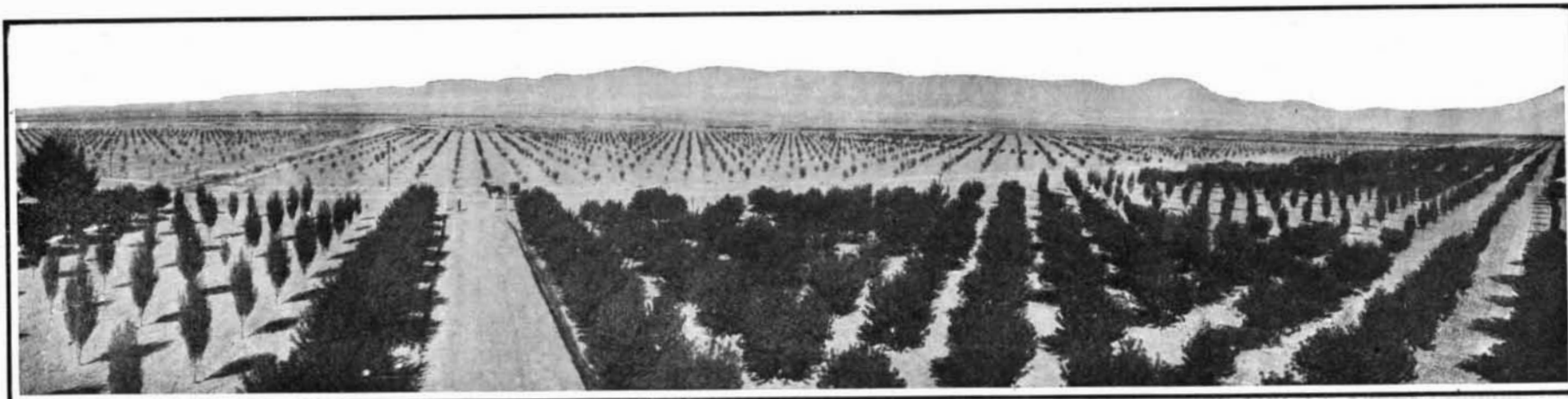
A photograph taken late in the evening, showing coal pots with draft covers set.

Grand Valley, sent there from their several communities to learn more of the recent experiment.

The raising of the temperature over this large area was accomplished by means of some 300,000 smudge pots of many different types, some burning oil for fuel and some coal, and placed at intervals in the

When finally the danger point was approaching, warning was sent to all the ranchmen to light the fires. Volunteers also in nearly all walks of life made their way in automobiles and wagons and on bicycles over the entire area. The Trades and Labor Assembly adjourned its meeting, and worked all night rendering

Taking one of the many kinds of pots as an example, and figuring coal at \$4 a ton, the cost of equipping with heaters and all other facilities for the first year for ten acres is estimated at \$449.25, and for the second year \$186.25. This provides in the initial cost for 800 heaters, or 80 to the acre. It also provides for 40



Typical Colorado orchards; young trees in the distance.

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tons of coal, kindling lighters, 50 pounds of waste, 200 gallons of oil for lighting, the storage for oil, and the building of a coal house. For the first year's equipment for oil pots, including 800 pots for ten acres, and fuel at 5 cents a gallon, the cost is estimated at \$494.25, and for the second year \$153.75.

Now that the question of raising the temperature even 10 or 15 deg. over a large area has been settled beyond doubt, the next problem facing the fruit growers is that of regulating the temperature and economy of fuel and labor. For example, there is no need of raising the temperature 10 deg. when raising it 2 deg. will put the blossoms out of danger. Some are planning to meet this problem by having a large number of small pots and only light enough of them to keep the temperature above the danger point. Others have devised pots with a system of drafts, so that the heat may be increased or decreased as is necessary.

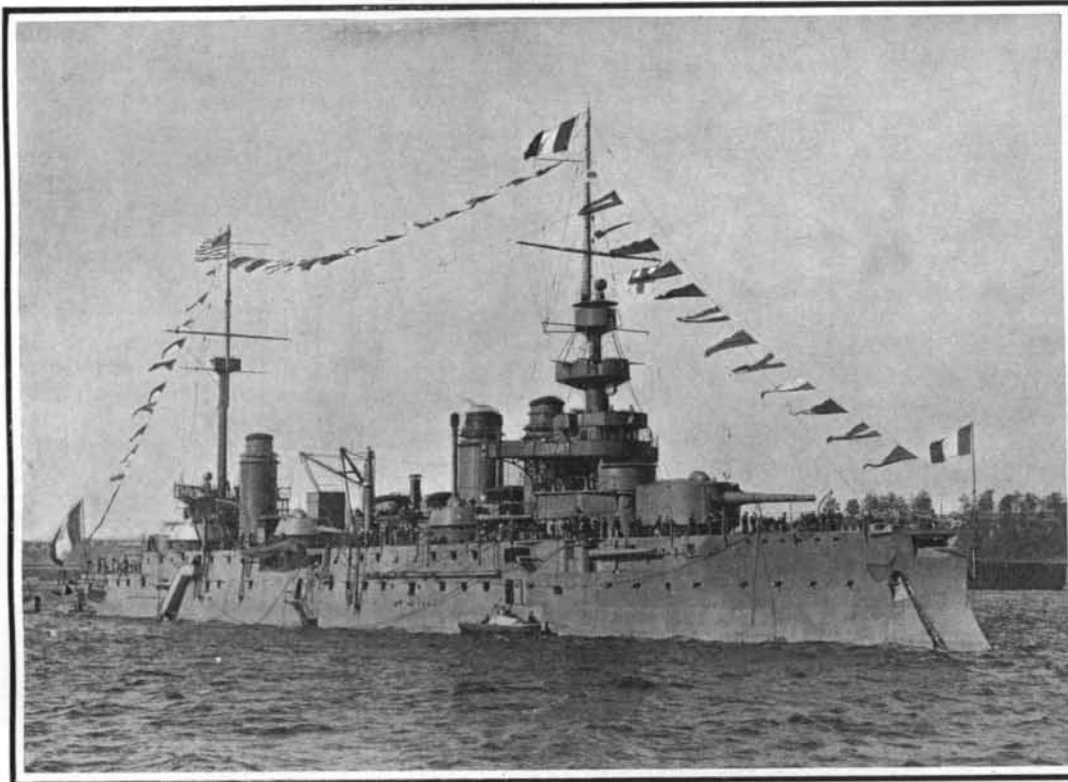
The fruit ranches of the Grand Valley are very ex-

tensive. One, for example, contains 243 acres, and is valued at a quarter of a million dollars. Its crops include peaches, apples, pears, plums, cherries, and soft-shell almonds. An army of people is required to pick the fruit. By another season it is expected electric lines will be running out to the orchards all over the valley, and refrigerator cars will be carried right to the orchards.

THE VISITING WARSHIPS—A COMPARISON.

Because of incompetence in its management the naval parade, which should have been one of the most attractive features of the Hudson-Fulton Celebration, came very near being a complete failure, and it was only redeemed by the fact that its line of travel lay parallel with the finest assemblage of warships that was ever gathered in the waters of the Western Hemisphere. The very devil of mischance seemed to have been abroad on the morning of September 25th, and

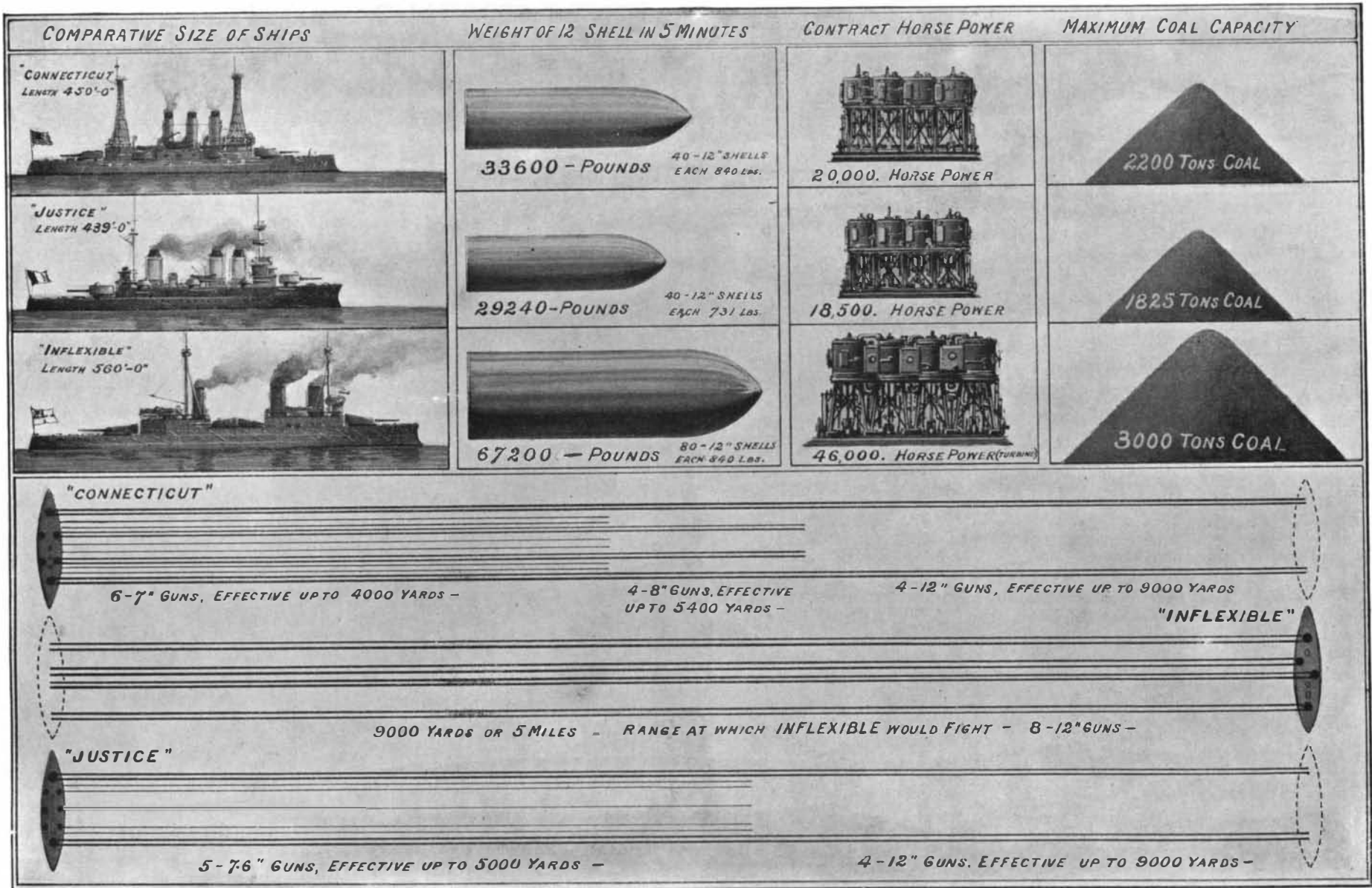
he became busy at the very outset, when the "Half Moon," in a laudable endeavor to show herself under sail, had no sooner spread her canvas, than she plumped squarely into the "Clermont," and came very near ending the career of that little craft there and then. The two great errors which made the parade a failure were, first, the anchoring of the "Half Moon" and the "Clermont" off 110th Street, instead of sending them under tow around the whole line from 42nd to 205th Street; and secondly, the failure to dispatch the commercial steamers, tugboats, yachts, etc., two or three abreast and with reasonably short intervals between them. As it was, a vast part of the visitors both ashore and afloat, all, in fact, who were above 110th Street, never caught a glimpse of the two vessels, the "Half Moon" and the "Clermont," in whose honor the parade was being held. Instead, for them, the procession consisted of a lot of detached and widely separated passenger steamboats, big and little, which



Displacement, 11,900 tons. Speed, 19.4 knots. Guns: Four 12-inch; ten 7.6-inch.
French Flagship, "Justice."



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The "Half Moon" under sail in the Lower Bay, New York.



In an engagement with the "Connecticut" and "Justice" the "Inflexible" would try to fight outside the armor-piercing range of their secondary batteries. These batteries, however, would cut her unprotected parts to pieces.

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