Patented Sept. 21, 1943 2,330,110

UNITED STATES PATENT OFFICE

2,330,110

METHOD FOR PLACING EXPLOSIVES IN SHOOTING WELLS

Rudolph C. Buchan, Houston, Tex., assignor to Standard Oil Development Company, a corporation of Delaware

No Drawing. Application October 31, 1941, Serial No. 417,276

3 Claims. (Cl. 166—21)

The present invention is directed to a method for completing wells.

In the completion of wells it is common under some conditions to detonate a charge of explosives in the bore hole adjacent the producing formation to initiate or increase the production of fluid from the formation. In conducting this procedure it is customary to encase the explosive in a suitable container and lower it to the desired position in the bore hole. In many cases, it is also desirable to place a quantity of weighting material or a "tamp" above the charge in order to insure satisfactory results from the shooting of the charge.

In many instances the amount of weighting material placed above the explosive charge is substantial. It is customary to use 1000 pounds of weighting material above explosive charges in a 7 inch hole under some conditions, and this material must be removed from the bore hole after the shot. It is customary to use gravel as the tamping material and to remove the gravel by bailing to clean out the hole. It will be evident that the removal of such large amounts of material by bailing or by similar mechanical methods is rather tedious and expensive.

In accordance with the present invention the weighting material placed above the explosive charge in shooting oil wells is of a type which may be removed by suitable liquid reaction. The employment of such material in shooting wells allows the elimination of the mechanical bailing of the tamping material.

I have discovered that pellets of zinc are particularly suitable for employment as the tamping material when shooting wells. This material is readily acid soluble and after the explosive charge has been detonated, acid may be introduced into the bore hole to dissolve the pellets, thereby making any mechanical bailing for removing the tamping material unnecessary. Moreover, in many instances it is advantageous to introduce acid into the bore hole adjacent the producing formation in order to increase the production of the formation.

In carrying out the invention of the present application, a number of advantageous results may be obtained, namely, the removal of the solid tamping material, the release of hydrogen adjacent the producing formation to aid in the initiation and production from the formation and, in addition, the action of the acid introduced in the bore hole upon the producing formation.

It will be apparent that materials other than zinc may be employed to form a readily soluble tamp. For example, other metals, such as aluminum, or readily soluble non-metals, such as calcium carbonate, may be used. It will also be obvious that a suitable agent for reacting with the material used as a tamp should be selected. For example, while inhibited hydrochloric acid is the preferred reagent to employ in conjunction with acid soluble materials, other acids, such as sulfuric, are available, and if acid is not a suitable solvent for the material used as the tamp, an appropriate solvent should be selected.

It is customary to enclose the explosive charge in sealed metal cans before lowering in the bore hole, and it is advantageous in practicing the present invention to construct the cans of a material which is soluble in the same reaction used for dissolving the tamps, thereby insuring that no metal scrap will remain in the bore hole. When employing zinc particles as the tamping material, it will accordingly be desirable to construct the containers for the explosive of zinc, whereby the can and the metal scrap from the tamp will be dissolved by suitable acid treatment. It will be obvious that other materials may be used for constructing the container, as desired.

While I have disclosed specific embodiments of the present invention, it will be apparent that various changes may be made without departing from the scope of the invention and it is my intention to embrace such changes by the hereto appended claims.

I claim:

1. A method of completing wells comprising the steps of placing a charge of explosive in a bore hole, placing a substantial amount of readily soluble weighting material above said charge of explosive as a tamp, detonating said explosive charge, and introducing into said bore hole a reagent capable of dissolving said tamp and allowing said reagent to remain in contact with said tamp until substantially all of the weighting material has been dissolved.

2. A method of completing a bore hole comprising the steps of introducing into said bore hole a charge of explosive arranged in a sealed soluble container, placing a substantial amount of weighting material soluble in the same reagent as said container above said explosive charge as a tamp, detonating said explosive charge, introducing into said well a reagent capable of reacting with both said tamp and the remnants of said container, and retaining said fluid in contact therewith for a sufficient length of time to dissolve substantially all of said tamp and the remnants of said container.

3. A method according to claim 1 in which zinc pellets are used for said tamp and hydrochloric acid as the reagent.

RUDOLPH C. BUCHAN.