

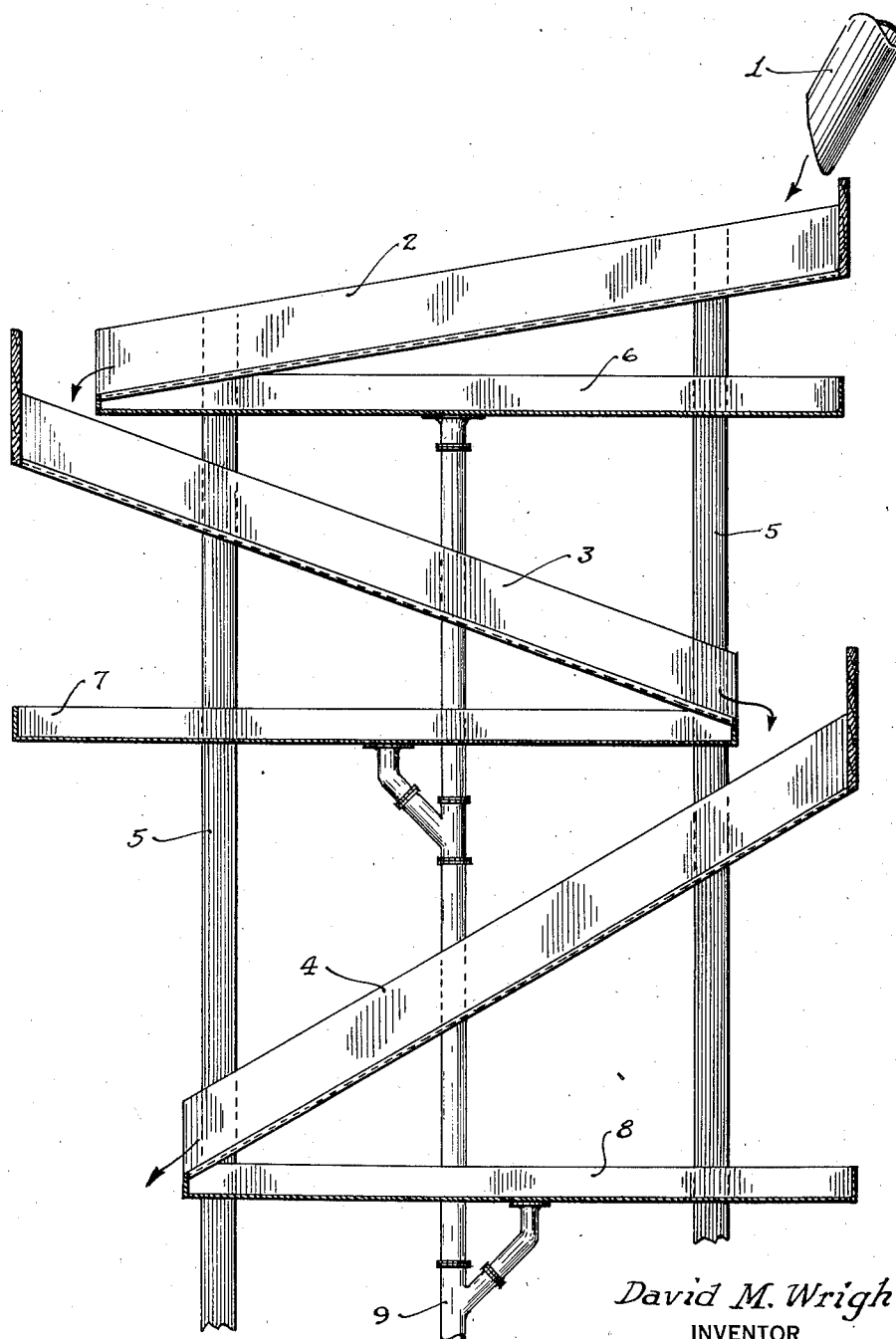
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DEWATERING METHOD

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DEWATERING METHOD

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1 Claim. (Cl. 210—149)

This invention relates to an improved dewatering method.

In mining operations in which large quantities of the mineral values are found in pieces differing in size from the nonmineral constituents of the gangue, it is customary to separate the mineral values from the nonmineral values by screens.

In the Florida phosphate fields the pebble phosphate is separated from the gangue by washing apparatus employing classifiers of different types, including screens.

One of the objects of the present invention is to provide an improved dewatering method particularly adaptable to phosphate rock washers. Phosphate rock in the Florida fields is hydraulically mined, and it is, therefore, necessary to dewater the rock during the process of classification.

Dewatering is one of the functions of the washer. It is common practice in phosphate rock mining to employ large quantities of water to carry the matrix from the pit to the washer. The material is delivered at the top of the washer, and in ordinary practice first passes over a flat screen with a slope of about 2 inches to the foot to dewater the material before it enters the logs. Screens of this type are usually about 30 to 40 feet long.

The method of the present invention employs a staged screen arrangement and secures more efficient dewatering than may be secured with a conventional dewatering screen.

The drawing is a diagrammatic side view, partly in section, showing one form of a staged screen arrangement which may be employed in the method of the present invention.

Material is delivered from the mine to the washer through pipe 1 and passes over a series of three screens, 2, 3, and 4, each of which is

about twelve feet long. Screen 2 is provided with a slope of two inches to the foot, screen 3, a slope of four inches to the foot, and screen 4, a slope of six inches to the foot.

The arrangement of screens exemplified in the drawing provides two distinct advantages in dewatering. In the first place, the stage arrangement gives a redistribution of the material when it passes from screen 2 to screen 3, and again when it passes from screen 3 to screen 4, which redistribution aids in dewatering.

It will be noted that the screens are mounted on a frame work 5 which also carries troughs 6, 7, and 8 beneath screens 2, 3, and 4 respectively to convey water passing through the screens to a common drain 9.

Since the material is progressively dewatered as it proceeds down the slopes, it becomes increasingly less mobile. The increased slope of each succeeding screen overcomes the tendency of the screens to clog, and permit surges of rock to flow over rock blocked at the lower end of the screen. It is this feature which gives the present invention the peculiar utility in dewatering minerals.

It will be understood that one or more of the screen stages may be of the vibrating type if desired. Vibration may be imparted through eccentrics or by means of any suitable apparatus.

I claim:

A process for dewatering a freely mobile mixture of water and a solid which during dewatering becomes increasingly less mobile which consists in passing the mixture solely under the influence of gravity, over a series of screens inclined in opposite directions and arranged one above the other with the inclination of the screens increasing from the first to the last of the series.

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