

particles, such as pebbles or lumps, within the screen, and it is to automatically get rid of these accumulations that the ejector G has been specially devised. The internal surface of the ejector G is quite plain, and is provided with two segmental apertures or slots  $g$  that lead into sector pockets G. These pockets are sectors of a circle of greater diameter than the screen, so that the periphery of the sector lies outside, but concentric with the periphery of the screen.

The segmental aperture  $g$  is partly covered by a bent and perforated plate  $g^1$ , which forms a scoop whereby the pebbles that lie on the bottom of the screen may be shovelled or guided through the aperture  $g$  into the sector pocket G. On the external front of the ejector plate is placed a hollow boss  $G^2$  that is divided down the centre by a strong partition  $g^3$  into two halves (see Figs. 6 and 7), one half being in direct communication with one sector pocket and other half with the other sector pocket. The part of each sector pocket that is nearest the axis is inclined outwards as at  $g^3$  towards the hollow half of the boss with which it is in communication, and such hollow portion of the boss merely forms a discharge passage that leads through an opening  $g^4$  formed in the side of the boss to the outer air. Figs. 4 and 5 show the ejector in a position such that the scoop  $g^1$  has just shovelled a charge of pebbles into the lower sector pocket. The plate still continuing to rotate, the charge of pebbles will be carried to a point above the axis, when the charge will fall and be guided by the incline  $g^3$  into the discharge passage in the boss, and from thence will be discharged through the opening  $g^4$  in the side of the boss on to the chute  $G^1$ .

The fine dirt and gold that pass through the meshes of the screen would have a tendency to accumulate near the upper end of the tank and slide down in bulk towards the cock H, thus choking it. To overcome this difficulty and to stir the dirt and keep it moving gently forward the vanes or propeller F have been placed on or near the periphery of the screen, the result of the application of these vanes being that as the screen rotates the dirt will be continually pushed nearer and nearer to the effluent cock H, and will then be carried by the water through the cock on to the distributor, and from thence on to the amalgamating safe.

The amalgamating safe consists of a box that is provided with a perforated plate  $k$  in its top and with a door that extends the whole length of its front side. To the inner side of this door one, two or more, or every alternate, amalgamating-shelf is secured, so that when the door is opened such of the shelves as are attached to the door shall move with it. By this means the whole of the amalgamating surfaces of the shelves will be exposed and the surfaces more readily cleaned; at the same time the whole of the amalgamating surfaces may be kept under lock and key by providing the bolt or fastening of the door with a padlock, and peculation of the precious metal will thus be prevented. In the drawings but four shelves are shown, but it is obvious that the safe may be provided with any suitable number of such shelves or amalgamating surfaces.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is—

1. In gold-separating and amalgamating apparatus an inclined rotary screen that revolves partly immersed in a tank of water, and that is provided with any suitable ejecting appliance for ejecting the coarse material that is retained within it, in combination with a number of radially-fixed vanes or propeller-blades such as F, as and for the purpose herein set forth and described.

2. In gold-separating and amalgamating apparatus an inclined rotary screen, the lower end of which is closed by a plain plate in which are segmental apertures that lead to sector pockets, such segmental apertures being provided with scoops whereby the pebbles or lumps may be automatically scooped into the sector pockets, the sector pockets being so constructed that as the screen rotates the pebbles and lumps shall fall upon inclines which shall deflect such lumps into a passage that leads to the outside of the machine, as and for the purpose herein specified.

3. In gold-separating and amalgamating apparatus the amalgamating "safe," consisting of any suitable number of silvered plates so arranged that every alternate such plate will be attached to the back of the safe and slope forward, while the intermediate alternate plates shall be attached to the door (so as to be withdrawn from the safe when the door is opened) and slope backwards in the opposite direction to the plates that are secured to the back of the safe, which may be closed and secured by a lock, all as and for the purposes herein set forth.

4. In gold-separating and amalgamating apparatus in combination, a feed-hopper, a revolving-screen that is provided with radial peripheral-vanes or propeller-blades, a water-tank in which the screen revolves, an automatic ejector appliance, an effluent cock which conveys the water and the dirt from the tank, a distributing appliance for distributing the water and dirt that issues from the effluent cock over a more extended front, and an amalgamating safe, such as that described, all as and for the purposes herein specified.

5. The general arrangement, construction, and combination of parts in our improved apparatus for the extraction of free gold from auriferous material, as described, and for the purposes set forth and specified.

Dated this 14th day of April, 1894, at Sydney.

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WILLIAM ROBERTS.

#### IMPROVEMENTS IN APPARATUS FOR WASHING AND SAVING GOLD, TIN, AND GEMS.

I, Robert Taylor Coghlan, of Sydney, New South Wales, engineer, do hereby declare the nature of my invention for improvements in apparatus for washing and saving gold, tin, and gems, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates chiefly to that class of machines for washing gold-bearing sands, clays, &c., wherein the wash-dirt in association with water is made to pass over a body of mercury by motion imparted to the vessel holding such mercury.

The main elements in the construction of the machine are: (1) A vibrating rocker-box containing slides supporting mercury-troughs; and (2) a barrel-agitator delivering the products from