1. In a concentrating and amalgamating machine, a pan divided into two halves, and oscillated on its axis by an arm and cam, substantially and for the purpose set forth.

2. In a concentrating and amalgamating machine, an oscillating-pan formed of two circular channels concentric with one another, the inner one of which is supplied with quicksilver, and has openings to the outer channel, substantially as and for the purpose set forth.

3. In a machine for concentrating and amalgamating the precious metals, constructed, arranged, and operating substantially as and for the purpose set forth herein and illustrated on the accompanying drawings.

Dated this 13th day of July, 1896.

W. E. Hughes,
Agent for the Applicant.

Improvements in Mechanical Ore-separators.

I, John Wendell Carter, of Brooklyn, in the County of Kings, and State of New York, U.S.A., gentleman, do hereby declare the nature of my invention for "Improvements in Mechanical Ore-separators," and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to certain improvements in that class of machines which are known as magnetic ore-separators, in which a number of permanent magnets are arranged in gangs one below the other, and over which the ground ore is passed by gravity, so that the magnetic particles of ore are separated from the non-magnetic particles in a quick and reliable manner.

The invention consists of an ore-separator in which a series of permanent magnets is arranged below the supply-hopper in such a manner that the lower pole ends are receding below the upper pole ends, which latter are in the path of the falling material that is conducted from the hopper over a magnetic deflecting-plate that is arranged above and at a short distance back of the upper pole ends of the magnets; so that the magnetic ore-particles are separated from the non-magnetic particles in their passage over the deflecting-plate and upper pole ends, and gradually conducted to the lower pole ends, while the non-magnetic particles are dropped by gravity and collected in a separate receptacle from the magnetic particles.

The invention consists, further, of certain details of invention which will be fully described and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of my improved magnetic ore-separator, showing the same arranged with three gangs of stationary magnets one below the other; Figure 2 is a front elevation of the same; Figures 3 and 4 are detailed vertical sections drawn on a larger scale, showing two different arrangements of the stationary magnets; and Figure 5 is a side elevation, partly in vertical section, of one gang of magnets and its supply-hopper, drawn on a still larger scale. Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the frame of my improved ore-separating machine, on the top of which is arranged a supply-hopper B, into which ground ore is placed. From the supply-hopper B the ore passes into a second hopper C, that is arranged vertically below the supply-hopper B. The hopper C is attached by means of slotted angle-bars d, and screws d^1 to the supported frame A, the angle-bars being attached to the side walls of the hopper C and the side posts of the frame A, as shown clearly in Figures 1 and 5. Below the hopper C are arranged two series or rows of permanent magnets D, which together form a gang.

The magnets D are supported in boxes D^1, of wood or other non-magnetic material, which are guided in exterior frames D^2 that are connected by pivots d^2 at their front ends to the posts of the supporting frame. The rear ends of the supporting frames D^2 are supported by hanger-rods H, which are provided with turn-buckles H^1, said hanger-rods being suspended by means of eyes at their upper ends from horizontal cross-rods K of the supporting frame A. By means of the turn-buckles the suspending-rods H can be lengthened or shortened, so as to give to the magnet-holding frames D^2 and to the rows of permanent magnets in the same the desired degree of inclination. The boxes D in which the magnets are located are connected with the rear parts of the frames D^2 by means of screws m, so that the boxes can be adjusted longitudinally in the frames D^2, said boxes being guided in ways or other suitable manner on said frames. By the adjustment of the adjustable frames and boxes one series or row of magnets D can be so arranged relatively to the other that their pole ends are arranged in the incline plane, so that the upper pole ends of one row of magnets extend beyond the lower pole ends of the same—in other words, that the lower pole ends are located in vertical planes to the rear of the upper pole ends, as shown in Figure 3; or the pole ends of the upper series of magnets may be arranged to project over the pole ends of the lower series of magnets, so that the latter are located in vertical planes successively to the rear of those above, as shown in Figure 4.

On the top of the upper magnet-holding box D^1 of each gang of permanent magnets is arranged an inclined magnetic deflecting-plate E, which is located near the front edge of the box, and adapted to be adjusted on the same in any approved manner. Below the lower series of magnets of each gang is arranged a chute F, the upper edge of which is vertically below the edge of the upper pole ends of the upper row of magnets, so that the magnetic ore-particles that are dropped from the pole ends are collected and conducted over a second chute F^1 to a suitable collecting receptacle. At the inside of the inclined front wall of the hopper C is arranged a deflecting-plate e, which is retained by a headed pin e^1 at its upper end, and adapted to be adjusted by means of a set-screw e^2 that passes through the inclined front wall of the hopper C, so that the inclination of the deflecting-plate can be adjusted, and thereby the stream of ground-ore thrown from the hopper to a greater or less distance, according to the relative position of the deflecting-plate E from the upper pole ends of the magnets. The parts so far described constitute one gang, and are repeated in each gang, of which a plurality may be arranged one below the other, all being supported by the