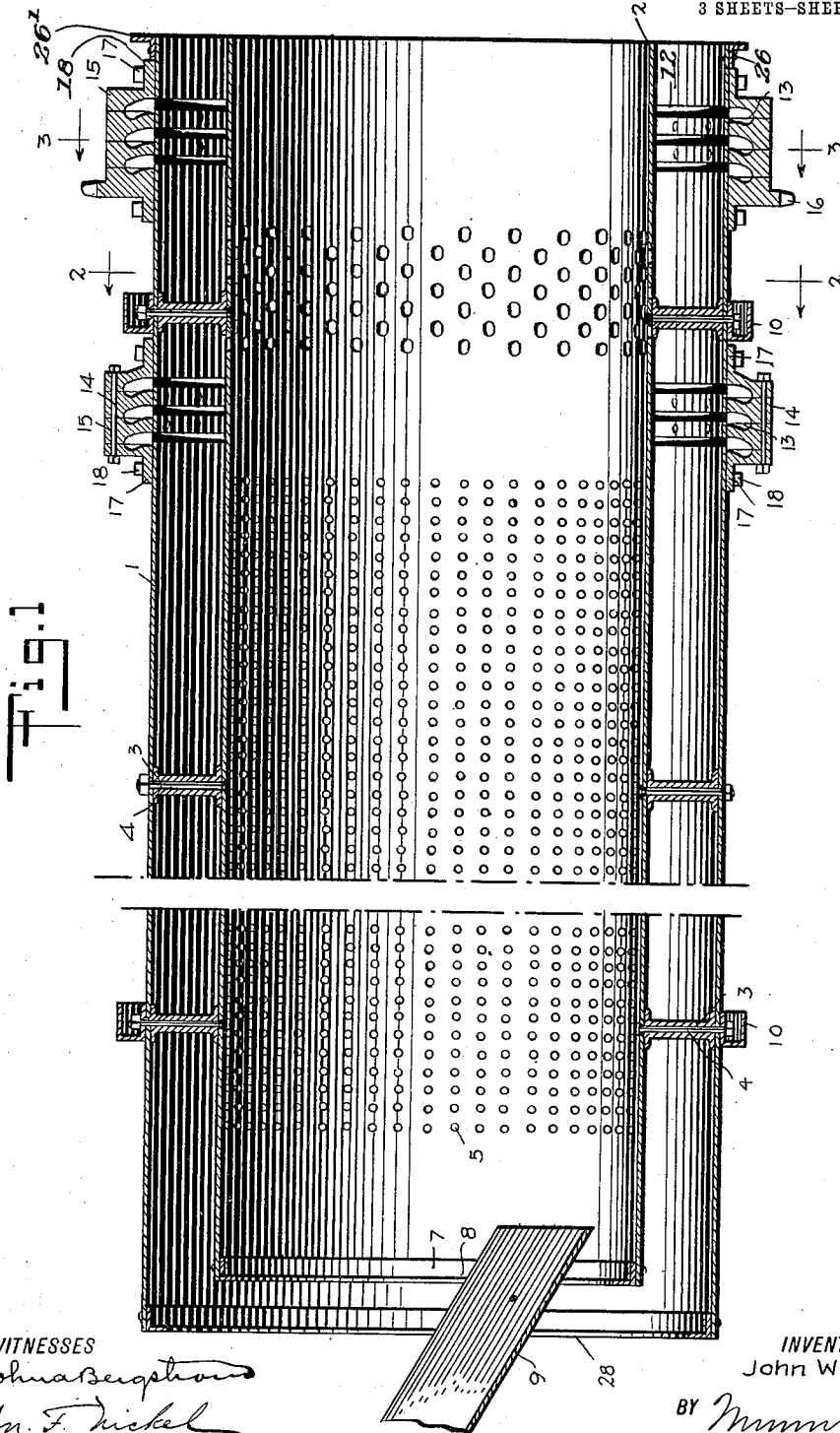


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SEPARATOR AND AMALGAMATOR.
APPLICATION FILED APR. 11, 1911.

1,027,952.

Patented May 28, 1912.

3 SHEETS-SHEET 1.



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3 SHEETS—SHEET 2.

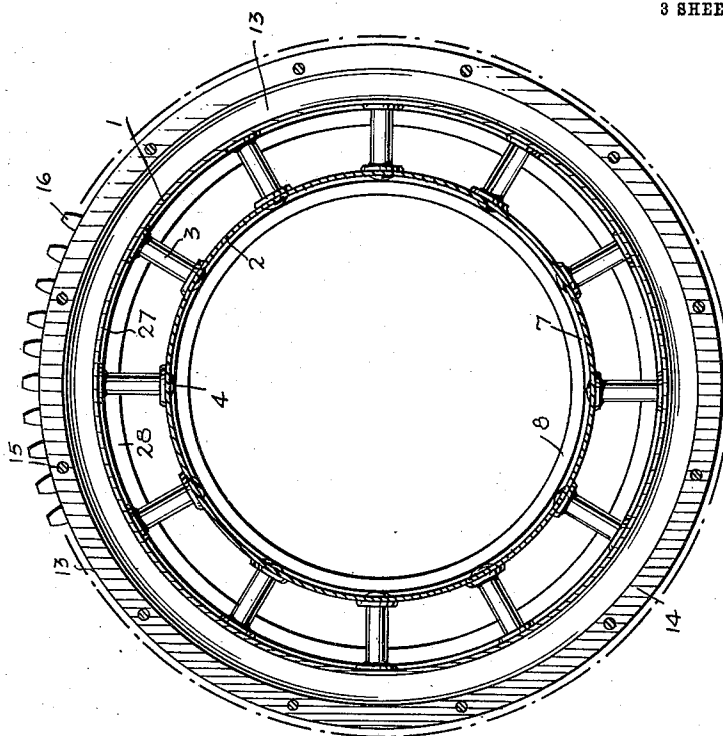


Fig. 1

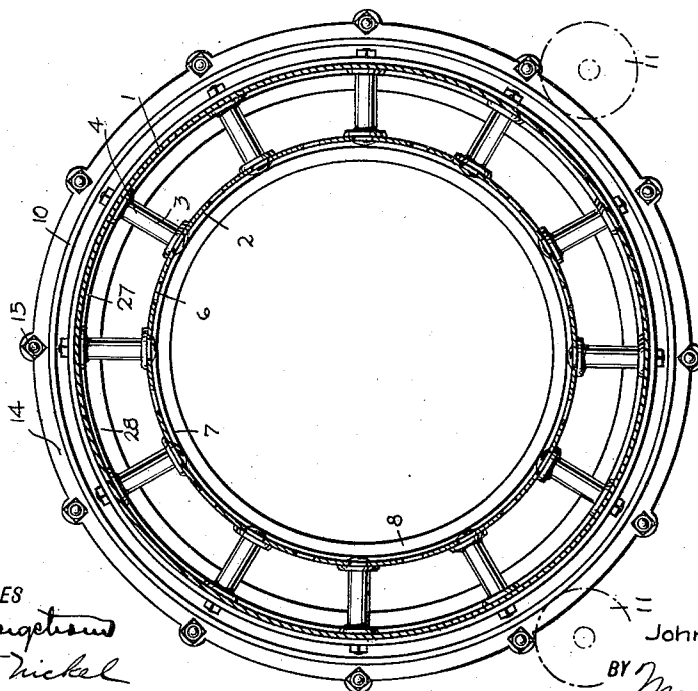


Fig. 2

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3 SHEETS—SHEET 3.

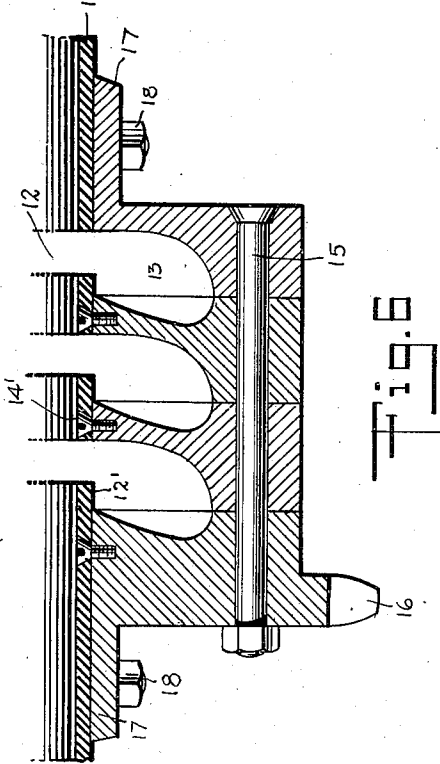


Fig. 6

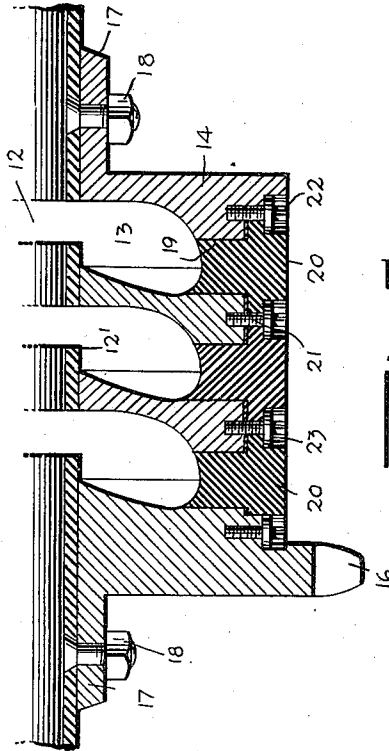


Fig. 7

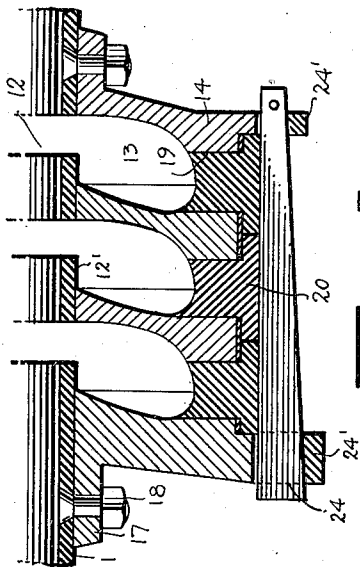


Fig. 4

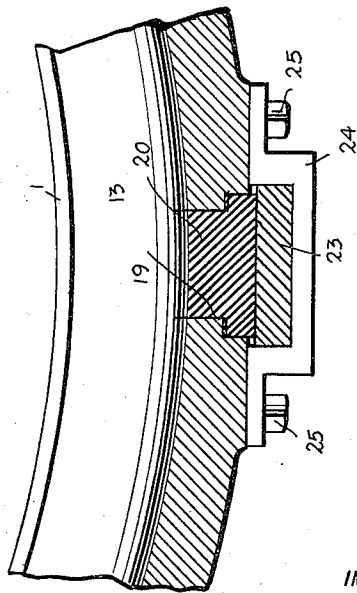


Fig. 5

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UNITED STATES PATENT OFFICE.

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1,027,952.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed April 11, 1911. Serial No. 620,312.

To all whom it may concern:

Be it known that I, JOHN WICK, a subject of the King of Norway, and a resident of the city of Council, in the District of Alaska, have invented a new and Improved Separator and Amalgamator, of which the following is a full, clear, and exact description.

My invention comprises a revolving screen employing certain new improvements for use in the mining of gold and other precious metals.

It is especially adapted for use in connection with gold dredging machinery, but it will also work to advantage in quartz mills and other mining installations.

The object of my invention is to produce a device of the character mentioned, so constructed that it will form a unitary device, and will in itself perform all of the steps necessary in mining gold by the dredging process which are now performed by numerous separate devices, expensive to manufacture and requiring considerable time and space to set up for use. By means of my mining apparatus I can do all of the work that is now done by ordinary screens, separators, cables and sluice boxes; thus I am enabled to dispense with much of the cumbersome apparatus that is kept in common use, thereby saving the space they occupy and providing ample room in which to operate my improved mining device to the best advantage.

Briefly stated, my invention consists of a tubular revolving screen inclosed by a tubular jacket. The jacket has pockets or riffles in its wall which contain mercury and act as amalgamating devices so that gold bearing earth, mud or sand, and the water with which it is mixed, will, when fed into the screen, be sifted therethrough and fall upon the wall of the jacket. The gold bearing ore thus sifted is passed over the amalgamating devices and the mercury in the same retains the precious metals. The amalgam formed in these riffles or pockets is removed at the close of the operation, and the metals it contains are recovered in the usual way. My invention therefore not only saves first cost to a great extent by enabling me to dispense with numerous devices now in use, but it also saves weight and space, effects a much greater saving of the ore that is fed upon it, and completes its operation within much less time than is usually required for work of this sort.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal vertical section of my combined screen with the amalgamating devices attached; Fig. 2 is a vertical transverse sectional view on the line 2—2 of Fig. 1; Fig. 3 is a similar view on the line 3—3 of Fig. 1; Fig. 4 is a vertical transverse section taken through the riffles or amalgamating pockets, showing the openings and one form of closure therefor; Fig. 5 is a section of the part shown on Fig. 4, taken on a plane at right-angles to the plane of section of Fig. 4; Fig. 6 is a vertical section of the amalgamator pockets, showing the manner in which the pocket structure is made up and held in assembled position; and Fig. 7 is a view similar to Fig. 4, showing another form of closing means for the charging and discharging openings to the amalgamating pockets.

On the drawings, 1 represents a cylindrical jacket made of suitable metal and inclosing concentrically therein a perforated screen 2. This screen is held spaced from the wall of the jacket 1 by means of separating tubes 3, having flanged ends and receiving through the longitudinal bores thereof fastening bolts 4. These separating or spacing tubes may be used in any number required and may be located in any desired position to hold the walls of the jacket 1 and screen 2 in proper relation. The screen serves as a receiving member for the materials to be worked.

The screen 2 is preferably made of boiler steel of suitable thickness, and near the left end thereof, as shown on Fig. 1, which end I term the receiving end, a number of perforations are formed in the peripheral wall thereof. These perforations are about one-quarter of an inch in diameter for the first few feet, after which they increase to three-eighths of an inch in diameter. Openings 6 are also formed near the opposite or discharge end of the screen, said openings being spaced from the openings 5 a suitable distance and separated therefrom by a portion of the screen 2 of continuous cylindrical surface. The receiving end of the screen carries an inner ring 7, having an in-turned flange or rim 8. This end also receives a hopper or trough 9, by which the gold bear-

ing earth mixed with water is fed into the screen. The rim 8 on the ring 7 serves to prevent any of the ore from falling out over the edge of the receiving end of the screen 2.

5 The outer jacket 1, inclosing the screen 2 has circular runners 10 thereon; two of these are shown, but obviously I may use any desired number, and they are preferably held in place by the bolts 4 passing through the separating members 3. These runners 10 are designed to rest upon supporting rollers 11, so as to permit the screen and jacket to rotate easily upon its axis.

15 Adjacent the discharge end of my invention are formed a number of annular recesses 12 in the wall of the jacket 1. These recesses may be continuous annular openings in the wall of the jacket 1, or they may be discontinuous, so as to form circular rows of apertures in the jacket wall. Preferably, I employ two sets of such openings, each set consisting of three, and each set arranged on opposite sides of the openings 6 in the screen 2. If these openings are made continuous, each opening of a set will form an equal annular aperture extending around the circumference of the jacket 1, and if they are not continuous, each member of each set will consist of a circular row of openings in the wall of the jacket. In either case, these openings communicate with pockets 13 of suitable size and shape, which are arranged on the exterior of the jacket 1, as shown. These pockets are formed in castings 14, which are circular in shape and of which four are used for each set consisting of three of the openings 12. The castings 14 are fastened together by means of bolts 15, as shown in Figs. 1 and 6, the bolt 15 being shown on only one set of castings on Fig. 1, as I deem it unnecessary to show the bolts on both sets. Before putting the castings 14 in place, the flat face of each is hollowed out in a lathe, so that when they are put on the jacket 1 in assembled relation they will form the pockets 13, as shown. Screws or other suitable fastening members 14 are employed to hold the castings 14 in place, and the outer castings of each set are flanged, as shown at 17, and held in place by bolts or nuts 18. The edge of each of the openings 13 nearest to the receiving ends is overlapped to a certain extent by the metal of the jacket 1, as shown at 12', so that each pocket 13 is larger than the opening 12' leading thereto. One of the outer castings of the set nearest to the discharge end of my device has a sprocket wheel 16 formed on its outer rim, so that a driving chain can be readily applied to keep the device in rotation when in use. Each of the pockets 13, which, as stated above, are annular in shape and extend entirely around the jacket 1, has formed there-

in an opening 19, closed by a plug or gasket 20. These plugs or gaskets may be held in position either by bolts 21 having squared ends 22, to receive and be operated by a suitable tool, and retaining collars 23, as shown in Fig. 7, or they may be held in place by means of a key 24 passing through straps 24', held in place by screws 25 on the outer castings of a set of riffles or pockets. These openings are all arranged in one plane, so that in cleaning up it is only necessary to turn the rotating structure so that the openings will be at the lowest point in order to withdraw the amalgam bearing the precious metal, from the pockets 13. The discharge end of the jacket 1 has an outer ring 26 secured thereto, said ring terminating in an out-turned rim 26', flush with the discharge end; and a ring 27 having an in-turned rim 28 is provided for the receiving end of the jacket, so that surplus ore will be prevented from falling out of the jacket in case any of it drops from the hopper 9 before reaching the receiving end of the member 2. The outer circumference of the castings 14 is formed smooth so that if desired this surface may be rested upon supporting wheels or rollers the same as the runners 10. The wheel on the outer surface of the castings 14, having the sprocket 16, for example, may have a flange on the face thereof nearest to the discharge end of my device, so as to take up the end thrust thereof, or the end thrust may be received by a flat-faced wheel abutting upon the out-turned rim 26' at the discharge end of the jacket.

In operation, my screen is supported at an inclination of about one and one-half inches to the foot, and the materials to be separated are fed into it by the hopper 9. The finer particles, consisting of ore and earth, pass through the smaller openings 5, and are washed by means of the water, downward along the inside of the jacket 1, until they reach the riffles or pockets 13. The particles of metal being heavier sink into the riffles or the pockets, forming an amalgam with the mercury therein, while the residue is passed out through the discharge end of the screen on a belt or conveyer. The heavier particles of earth which do not readily pass through the openings 5 will be washed on until they reach the larger openings 6, which are about one and one-half inches in diameter. These openings 6 permit the discharge of nuggets and lumps of earth, and these nuggets will also pass into the pockets 13 after dropping upon the bottom of the jacket 1. All of the lumps which are too coarse to pass through either the openings 5 or 6 are discharged by the inner member 2 upon the belt or conveyer, the same as the particles of earth and the like that are passed along the bottom of the jacket 1 past

the pockets 13. The tailings or residues are thus saved after being thrown out of the discharge end of my mining screen, and can be worked over. Any leakage at the receiving end of the screen is obviated by the rings above described, having the in-turned rims, as shown, but I preferably make the inner end, or receiving end, of the jacket overlap the receiving end of the member 2, so that anything that drops from the receiving end of the member 2 will not fall out upon the ground and be lost.

My mining screen is especially designed for use in connection with gold dredging machinery, and from the above description it will be seen that it is so shaped as to be compact and easily handled for transportation in the rough country of mining districts. Furthermore, it is simple in its construction and mode of operation; it can be set up almost anywhere and operated by hand power or foot power if machine power is not available, and because of the fact that it forms a complete machine performing in itself all of the functions for which separate devices are ordinarily used, it is in every respect a practical device for the purpose in hand. It particularly effects a great saving in the amount of space required to install it, so that it can be set up in dredging boats of small size. In such boats it can be readily and easily employed in regions where large craft are not available.

While my machine is especially used in the dredging of gold, it obviously could be employed in connection with quartz mills to receive the ore after it has been crushed by stamps. The ore so received would be sifted and the particles of free metal gathered up by the mercury in the pockets 13, and the tailings could be remilled in the same way. To fill the pockets 13, the rotary structure is turned so that the openings in the pockets 13 are slightly elevated. The gaskets 20 are then removed and a certain quantity of mercury is then poured into each one of the pockets or riffles. After the charge of mercury is put in place, the riffles are closed and the gaskets secured in their places in the openings.

To clean up the values recovered in each operation, it is only necessary to place a tub underneath the jacket 1 in line with either or both of the castings 14, with the openings therein at their lowest level. When the closing members or plugs 20 are removed, the amalgam formed drops out into the tub and is removed for treatment, and the machine is then ready for further use.

It will be observed that the apertures 12, although smaller than the ends of the

pockets 13, permit the particles of precious metal to sink and fall readily into the riffles at the same time the overlapping or projecting edges 12' prevent the particles of metal and amalgam from being washed out of the riffles and lost by back eddies and whirls in the water.

In case the apertures are made continuous around the jacket 2, so as to divide it into sections, these sections near the discharge end will be joined to the main body of the jacket and secured thereto by the castings and binding bolts forming the structure of the riffles or pockets.

Changes in the shape and size of the parts within the scope of my invention may be made if desired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. Means for forming a concentrating pocket for an amalgamator, comprising a plurality of members each having a surface adapted to fit against the exterior of the amalgamator and a pair of surfaces intersecting said first-named surface, each of said members also having a longitudinal groove formed in one of said pair of surfaces and a longitudinal recess formed in the other of said pair of surfaces, said recess opening inward through said first-named surface, said members being fitted together to bring the groove in one member into registry with the recess in an adjacent member, to form a series of pockets.

2. Means for forming a concentrating pocket for an amalgamator, comprising a plurality of members each having a surface adapted to fit against the exterior of the amalgamator and a pair of surfaces intersecting said first-named surface, each of said members also having a longitudinal groove formed in one of said pair of surfaces and a longitudinal recess formed in the other of said pair of surfaces, said recess opening inward through said first-named surface, said members being fitted together to bring the groove in one member into registry with the recess in the adjacent member, to form a series of pockets, said members also having transverse registering recesses in their adjacent faces communicating with said grooves and recesses to form outlet openings for said pockets.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WICK.

Witnesses:

G. A. ADAMS,
WM. BURGHARDT.