To all whom it may concern:

Be it known that we, HENRY M. SUTTON, WALTER L. STEELE, and EDWIN G. STEELE, citizens of the United States, residing at Dallas, in the county of Dallas, State of Texas, have invented certain new and useful Improvements in Dry Ore-Concentrators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a dry ore-concentrator, and particularly to a structure comprising a moving pervious belt, through which a pressure of air is passed for the purpose of performing a concentration upon the surface of the belt.

The invention has for an object to materially improve the means for introducing the air intermittently through the belt in its passage over the air-chambers and for collecting the results of the concentration.

A further object of the invention is to provide improved means for supporting and adjusting the table at different inclinations and driving it when so adjusted.

Another object of the invention is to improve the structure of riffer and driving means therefor in order to secure the most efficient results of the operation of the machine.

Other and further objects and advantages of the invention will be hereinafter set forth, and the novel features thereof defined by the appended claims.

In the drawings, Figure 1 is a side elevation of the machine; Fig. 2, a vertical longitudinal section thereof; Fig. 3, a detail vertical cross-section showing the belt, riffle, and driving means therefor. Fig. 4 is a side view of the driving means for the belt-conveying rollers; Fig. 5, an end view of the same; Fig. 6, a detail perspective of the connection between the riffle and a link of the driving-chain; Fig. 7, a detail vertical section showing the adjusting means for the lower end of the table; Fig. 8, a detail longitudinal section through the belt and one of the riffles. Fig. 9 is a detail of a modified arrangement of the riffles upon the belt. Fig. 10 is a detail vertical section, upon an enlarged scale, through the clean-up chamber. Fig. 11 is a detail plan of the air-cut-off slats with the reticulated supporting-surface broken away. Fig. 12 is a detail plan of the cone-pulleys and the belt-adjuster therefor, and Fig. 13 is an enlarged vertical section through the discharging-roller at the upper end of the table.

Like letters of reference refer to like parts in the several figures of the drawings.

The letter A designates a supporting-frame of any desired construction, preferably provided with an inclined upper surface A', upon which a working-table B is supported at its upper end by means of standards B', pivotally connected thereto, as shown at B', and at its lower end by means of an adjusting-standard B", having a threadued upper end B', adapted to receive an interiorly-threaded sprocket-wheel B', upon which a bracket B" from the table B rests. The sprockets at opposite sides of the table are connected by means of chains B', so as to be adjusted simultaneously and to the same extent, while after the adjustment desired is reached the parts may be locked in their position by means of a nut B", disposed upon the thread end of the standard B", above the bracket B", as shown in Figs. 1 and 7. The working-table B, as shown in Fig. 2, has upon its upper surface a perforated support C, which is supported at suitable intervals by means of cross-slats C', spaced any desired distance apart at the lower end of the table to cutoff the air to a portion of the belt lying above them. Beneath these slats a partition C' is disposed and provided with inwardly-opening valves of any desired construction—for instance, the flap-valves C', as shown—thus forming an air-chamber C', in which the air will be under a continual pressure. Below the partition C' a bellows C' is provided and pivoted at its lower end C', the lower wall C' of said bellows being provided with a series of inwardly-opening valves C' and with a transverse partition C", thus dividing the bellows into a lower chamber C'0 and an upper clean up chamber C'1. At the lower end of the table a dust-hopper D is formed and provided with a plate D' over its upper portion, so that the contents thereof shall not be displaced by the air-pressure, while an entrance-opening D' is formed at the lower end of the plate. Above this opening an
aperture D is formed in the partition C to permit the passage of dust which may collect in the chamber C downward into the hopper, which is provided with any suitable form of removable side or door D for emptying the same when desired. It will be seen that the lower bellows in connection with the pressure-chamber C maintains a continual air-pressure upon the lower portion of the table, which passes outward intermittently through the different parts of the traveling pervious belt E, lying in supporting contact with the perforated plate C. The pressure-chamber above the clean-up chamber C is provided with a spring-controlled relief-valve F mounted at the upper end thereof, and the bellows is separated therefrom by a partition F and from the chamber C by a transverse partition F. The aperture is supplied with a series of inwardly-opening flap-valves F, while beneath the pervious belt and perforated plate a series of slats F are disposed and spaced from each other a distance equal to the width of the rifles E, carried by the pervious belt E, so that as these rifles lie over the spaces the supply of air is cut off, and as they pass over the slats an intermittent blast is given to the concentrates carried upon the pervious belt. At this or any other desired point a cleaning-brush F is pivoted above the rifles and adapted to contact with the upper face thereof to remove any surplus material thereon. The pervious belt E after traveling over the table passes over a roller G, having flaps G, of flexible material, such as rubber or leather, adapted to retain their general shape in use and extending longitudinally thereof, which engage the belt between the rifles and cause the pervious cloth thereof to extend or project outward when passing over the roller, thus facilitating the deposit of the concentrates in the hopper G provided therefor and supported by the frame at the upper end of the table. The pervious belt passes thence downward beneath the table and over the guide-rollers G, G, and G, if found desirable, while beneath this lower layer of the belt a dust pan or shelf G is provided to catch all adhering particles which may fall from the belt and conduct them to a proper point of discharge.

The material to be operated upon is fed upon the pervious belt from the hopper H, supported in any suitable manner—for instance, by standards H, extending upward from the inclined face A of the frame. The hopper is provided at its lower end with a discharge-spout H, beneath which a reciprocating pan H is mounted by means of rods H, extending downward from the upper portion H of the hopper and pivotally connected to the pan at H, and is adapted to be reciprocated from a driving eccentric H, carried by a driving-shaft H, suitably mounted upon one of the standards H, and provided with a driving-pulley H, driven by the belt H from any suitable source of power. This hopper is adapted to discharge the material at a point upon the table between the intermittent blast portions, so that the ore which travels downward in the initial action is subsequently brought by the belt over the upper intermittent blast.

For the purpose of driving the bellows and endless pervious belt a driving-shaft I is mounted in the frame and supplied at one end with a driving-pulley I and between its ends with a speed-regulating cone I, communicating with a similarly oppositely disposed cone I by means of a connecting-belt I, which passes through a suitable belt-sitter I, mounted upon the frame for the purpose of adjusting the belt to vary the speed of the apparatus and the consequent motion of the bellows, which is connected to the cone I by means of a rod I, adjustably secured at I by a coupling disposed eccentrically to the shaft of the cone and pivoted to the bellows at the upper end I. One end of the driving-shaft I is also provided with a worm-wheel J adapted to mesh with a gear J, carried upon a shaft J, supported in the framework of the apparatus and having at its opposite end a beveled gear J, meshing with a corresponding gear J upon the lower end of the vertical shaft J, which is supported in any desired manner—for instance, by means of a collar-bracket J—from the frame of the machine. The upper end of this shaft has secured thereto a worm-wheel J, meshing with a gear J, secured to the end of the roller G for the purpose of driving the same. Upon the end of this roller and also the guide-rollers G, G, and G, sprocket-teeth are provided adapted to engage with the chain-sections K, carried by the belt and connected to the rifles, thus providing a positive driving means for carrying the pervious belt in its predetermined path. The chain K is adapted to lie within a recess K at the sides of the table as the belt passes over the perforated face C.

The rifles, which may be formed of any desired material, are adapted to be secured to the pervious belt E in an improved manner by means of the metallic braces K, which extend beneath the belt and are provided with an angularly-disposed portion K to bring the outer end K into alignment with the chain-links K, which links are provided upon one side with a connecting-plate K, adapted to be secured to the end K by a rivet K, as shown in Figs. 3 and 6. The pervious belt E lies over this brace and above the belt, and below the brace are leather belts K, disposed within the recess K to fill the space at the edge of the recess, while between the rifles a leather filling K extends for a similar purpose, as shown by the detail in Fig. 8. Disposed above the metal brace K is a rifle-block K, preferably of wood, having an angular portion to hold the pervious belt in contact with one end of the brace K, thus preventing any movement of the rifle longi-
tudinally of the belt, while upon the upper surface of this block a metal strip K° extends and is adapted to take the wear incident to the contact of the ore therewith, all of said parts being secured together by a bolt K'. In the operation of the invention the ore is fed upon the endless moving pervious belt and carried thereon by the flexible out which the air-pressure passes, and the lower portion of this belt is under an intermittent blast of one duration, while an intermittent blast of a different duration is provided at the upper part thereof by means of the passage of the riffles over the slats of the table. It will be observed that the bellows has been divided by a flexible partition into an upper and lower chamber connecting with the respective air-chambers for effecting the intermittent blasts. The perforated table over which the riffled pervious belt travels is provided with slats beneath the same, so that the lower portion of the table forms a separator and the upper portion a clean-up chamber. The slats in the lower portion reduce the area of opening through which the air passes and cause the ore to be intermittently acted upon by the air when the portion of the belt between the riffles is over the space between the slats. As the ruffle carrying the ore travels upward over this portion of the table it passes from an active to an inactive portion and the upper part of the ore in the ruffle is first acted upon, and thus allowing the values in the ore or gravel being treated to settle to the cloth and to be caught in the riffles. In the clean-up chamber at the upper portion of the table the slats are spaced apart substantially the width of each ruffle, and the slats are of equal width. This causes the riffles carried by the belt to act as sliding valves, opening and closing openings below as they pass over the slats. As the riffles pass over the openings between the slats, gradually closing the same, the air is concentrated on the ore carried by the belt, which forces the gangue or light particles over the ruffle into the pocket below, and as the ruffle leaves the open space the air is concentrated on this gangue just forced over and blown farther down the table. This action is repeated as each ruffle passes over the open space in the table. The revolving brush over this portion of the table is only used when the material carries a quantity of fine compressible material which would ride on the top of the ruffle and fall into the concentrates-hopper at the upper end of the table without being properly concentrated. The brushes thus keep the top of the riffles clean, while the valves to the air-chamber beneath the slit prevent all back pressure of the air on the downstroke of the bellows. The dust-hopper at the lower end of the table is arranged to receive all dust that should pass through the pervious belt, and this dust works downward through the slot in the bottom, so that it is forced into the hopper upon each stroke of the bellows. The dust-pan beneath the table is arranged to catch all particles of material adhering to the pervious cloth which fall off the belt as it travels beneath the table and may be caught in a receptacle at the foot of the pan. The roller at the upper end of the table over which the traveling belt passes is provided with ribbed projections, which cause the cloth between the riffles to project or extend as it passes over the roller, and the concentrates thus carried by the riffles slide upon the projection and are thus prevented from striking the back of the ruffle ahead, while the projection of the cloth increases the diameter of the roller at that point, which causes the concentrates to fall further over into the hopper. The riffles are provided with a wooden strip secured between two metal faces—the ruffle-support beneath the belt and the metal capping above the wood—which makes a very strong and stiff ruffle and one which when riveted to a belt-chain may be used to convey the belt in the most desirable manner. The leather bellows secured at the edges of the pervious belt form a closure for the open end of the recess within which the belt-chain is disposed, and thus prevent the collection of ore or dust therein, which would be liable to interfere with the operation of the belt. The structure of driving means is adapted to permit a definite regulation of speed of both the bellows and traveling apron relative to each other and also to allow an adjustment of the bellows' stroke in order to maintain the desired pressure within the chamber for the most efficient action, while the adjustment of the lower end of the table permits the inclination thereof to be varied, so that the fall of particles by gravity can be regulated to any extent.

An important feature of this invention is the graduated air-pressure in the clean-up chamber, which is controlled by the valve F, before described, which may be of any desired character, although shown in detail in Fig. 10 as comprising a flap-valve F, covering an opening F from the clean-up chamber and normally held closed by the spring F, the tension of which may be adjusted to any desired degree by means of an adjusting-screw F, mounted in the bracket F. It will be seen that the maximum pressure is controlled by this valve, and the riffles opening and closing the air-outlets concentrate the blast on the remaining material carried by the belt until the gangue has been separated from the values and by an adjustment of the spring tension the air-pressure for the blast may be determined, depending upon the character of ore operated upon. When the ruffle passes over the open space, there is a short rest which allows the values and other material to settle down between the riffles until they again reach an open space, when the air is concentrated on the ore, gradually
beginning at its upper edge, where it is thickest and where the least values are, as each agitation of the mass allows the values to settle downward and toward the angle between the riffle and the belt.

In Fig. 9 a detail of a modified arrangement of riffles upon the belt $E$ is shown, which is adapted for use upon fine dry ore and comprises alternate riffles $E'$ of greater height than the intermediate riffles $E$. This arrangement reduces the amount of concentrates brought over by the belt nearly one-half and provides double the number of riffles for saving fine values, while the riffles being close together the cloth is held perfectly tight and true, so as to be prevented from flapping or pitching at each stroke of the bell or bellows. As the upper edge of the belt is made of sponges or felt, and the intermittent action of the air upon the ore is secured by an arrangement of slats beneath the belt and relative to the width of the riffles.

It will be obvious that changes may be made in the details of construction and configuration of the several parts without departing from the spirit of the invention as defined by the appended claims.

Having described our invention and set forth its merits, what we claim, and desire to secure by Letters Patent, is—

1. In a dry ore-concentrator, a table, a moving pervious belt thereon, means for producing an air-pressure through said belt, riffles upon said belt, and slats beneath the belt disposed relative to the riffles and adapted to cover the belt between adjacent riffles; substantially as specified.

2. In a dry ore-concentrator, a table, a moving pervious belt thereon, means for producing an air-pressure through said belt, riffles upon said belt, slats beneath the belt spaced relative to the width of said riffles, those slats at the upper portion of the table being closer together than those below the same; substantially as specified.

3. In a dry ore-concentrator, a table, a moving pervious belt thereon, means for producing an air-pressure through said belt, riffles upon said belt, slats beneath the belt spaced relative to the width of said riffles, those slats at the upper portion of the table being closer together than the same, and a hopper disposed above the table and intermediate of the ends thereof; substantially as specified.

4. In a dry ore-concentrator, a table, a moving pervious belt thereon, means for producing an air-pressure through said belt, riffles upon said belt, slats beneath the belt disposed relative to the riffles and adapted to cover the belt between adjacent riffles, an air-chamber beneath the belt, and means for regulating the maximum pressure of air in said chamber; substantially as specified.

5. In a dry ore-concentrator, an inclined table, an endless pervious belt mounted thereon and provided with riffles, means for continuously moving said belt, a series of slats extending parallel to said riffles and adapted to cover the belt between adjacent riffles, and an air-chamber beneath said slats; substantially as specified.

6. In a dry ore-concentrator, an inclined table, an endless pervious belt mounted thereon and provided with riffles, means for continuously moving said belt, a series of slats extending parallel to said riffles and adapted to cover the belt between adjacent riffles, a valve to form an air-chamber beneath said slats, and a bellows beneath said air-chamber for providing a pressure of air therein; substantially as specified.

7. In a dry ore-concentrator, an inclined table, an endless pervious belt mounted thereon and provided with riffles, means for continuously moving said belt, a series of slats extending parallel to said riffles and adapted to cover the belt between adjacent riffles, a valve to form an air-chamber beneath said slats, and bellows beneath said air-chamber for providing a pressure of air therein, a transverse partition in said air-chamber to comprise a clean-up chamber in the upper end thereof, and a transverse partition in said bellows to form an independent air-supply for the clean-up chamber; substantially as specified.

8. In a dry ore-concentrator, an inclined table, an endless pervious belt mounted thereon and provided with riffles, means for continuously moving said belt, a series of slats extending parallel to said riffles and beneath the belt, an air-chamber beneath said slats, a bellows beneath said air-chamber for providing a pressure of air therein, a transverse partition in said air-chamber to comprise a clean-up chamber in the upper end thereof, and a transverse partition in said bellows to form an independent air-supply for the clean-up chamber; substantially as specified.

9. In a dry ore-concentrator, an inclined table, an endless pervious belt mounted thereon and provided with riffles, means for continuously moving said belt, a series of slats extending parallel to said riffles and beneath the belt, an air-chamber beneath said slats, a bellows beneath said air-chamber for providing a pressure of air therein, a transverse partition in said air-chamber to comprise a clean-up chamber in the upper end thereof, a transverse partition in said bellows to form an independent air-supply for the clean-up chamber, a dust-hopper at the lower portion of the table having an inlet thereto at its lower portion; substantially as specified.

10. In a dry ore-concentrator, an inclined table, an endless pervious belt mounted thereon and provided with riffles, means for con-
continuously moving said belt, a series of slats extending parallel to said rifles and beneath the belt, an air-chamber beneath said slats, a bellows beneath said air-chamber for providing a pressure of air therein, a transverse partition in said air-chamber to comprise a clean-up chamber in the upper end thereof, a transverse partition in said bellows to form an independent air-supply for the clean-up chamber, a dust-hopper at the lower portion of the table having an inlet thereto at its lower portion, means for regulating the maximum air-pressure in said clean-up chamber, a concentrates-hopper at the upper end of said table, and a bearing-roller for said belt at the upper end of the table having flexible blades thereon to bear upon the belt between the rifles; substantially as specified.

11. In a dry ore-concentrator, a table having at its lower portion a series of transverse slats spaced apart and at its upper portion similar slats spaced closer together than the lower slats, a moving pervious belt, rifles upon said belt of equal width to the spaces between the upper slats of the table, and an independent air-chamber beneath the upper and lower sections of slats; substantially as specified.

12. In a dry ore-concentrator, a table having at its lower portion a series of transverse slats spaced apart and at its upper portion similar slats spaced closer together than the lower slats, a moving pervious belt, rifles upon said belt of equal width to the spaces between the upper slats of the table, a partition beneath said slats having inwardly-opening valves, a transverse partition between the slats and valved partition to form independent air-chambers beneath the slats, and bellows secured to said valved partition and provided with a transverse partition therein to form independent air-feeding means for each chamber, a feed-hopper above said belt disposed to discharge thereon between the sections of slats, means for simultaneously driving said belt and bellows, a cleaning-brush disposed above said slats, a concentrates-hopper at one end of the table, and a bearing-roller for the belt above said hopper having flexible blades to discharge the concentrates from the belt; substantially as specified.

13. In a dry ore-concentrator, a table having at its lower portion a series of transverse slats spaced apart and at its upper portion similar slats spaced closer together than the lower slats, a moving pervious belt, rifles upon said belt of equal width to the spaces between the upper slats of the table, a partition beneath said slats having inwardly-opening valves, a transverse partition between the slats and valved partition to form independent air-chambers beneath the slats, bellows secured to said valved partition and provided with a transverse partition therein to form independent air-feeding means for each chamber, a feed-hopper above said belt disposed to discharge thereon between the sections of slats, means for simultaneously driving said belt and bellows, a cleaning-brush disposed above said slats, a concentrates-hopper at one end of the table, a bearing-roller for the belt above said hopper having flexible blades to discharge the concentrates from the belt, a pan extending beneath the table and belt for receiving material carried by the belt past the concentrates-hopper; substantially as specified.

14. In a dry ore-concentrator, a table having at its lower portion a series of transverse slats spaced apart and at its upper portion similar slats spaced closer together than the lower slats, a moving pervious belt, rifles upon said belt of equal width to the spaces between the upper slats of the table, a partition beneath said slats having inwardly-opening valves, a transverse partition between the slats and valved partition to form independent air-chambers beneath the slats, bellows secured to said valved partition and provided with a transverse partition therein to form independent air-feeding means for each chamber, a feed-hopper above said belt disposed to discharge thereon between the sections of slats, means for simultaneously driving said belt and bellows; substantially as specified.

15. In a dry ore-concentrator, a table having at its lower portion a series of transverse slats spaced apart and at its upper portion similar slats spaced closer together than the lower slats, a moving pervious belt, rifles upon said belt of equal width to the spaces between the upper slats of the table, a partition between said slats having inwardly-opening valves, a transverse partition between the slats and valved partition to form independent air-chambers beneath the slats, bellows secured to said valved partition and provided with a transverse partition therein to form independent air-feeding means for each chamber, a feed-hopper above said belt disposed to discharge thereon between the sections of slats, means for simultaneously driving said belt and bellows, a cleaning-brush disposed above said slats, a concentrates-hopper at one end of the table, a bearing-roller for the belt above said hopper having flexible blades to discharge the concentrates from the belt; substantially as specified.

16. In a dry ore-concentrator, a table having at its lower portion a series of transverse slats spaced apart and at its upper portion similar slats spaced closer together than the lower slats, a moving pervious belt, rifles upon said belt of equal width to the spaces between the upper slats of the table, a partition beneath said slats having inwardly-opening valves, a transverse partition between the slats and valved partition to form independent air-chambers beneath the slats, bellows secured to said valved partition and provided with a transverse partition therein to form independent air-feeding means for each chamber, a feeding lip upon its under face, a brace for said rifle extending beneath the belt and engaging said lip, and a carrier-chain connected to the end of said brace; substantially as specified.

17. In a dry ore-concentrator, a pervious belt, a rifle disposed thereon having a depending lip upon its under face, a brace for said rifle extending beneath the belt and engaging said lip, and a carrier-chain connected to the end of said brace; substantially as specified.

18. In a dry ore-concentrator, a pervious belt, a rifle disposed thereon, a brace for said rifle extending beneath the belt, a carrier-chain connected to the end of said brace; a
side wall provided with a recess to receive said chain, and a filling material carried by the belt between the adjacent riffles thereof, and a flexible belt above said riffles and filling material to close the open end of said recess; substantially as specified.

19. In a dry ore-concentrator, a pervious belt, a rifle disposed thereon having a depending lip upon its under face, a brace for said rifle extending beneath the belt and engaging said lip, a carrier-chain connected to the end of said brace, a side wall provided with a recess to receive said chain, a filling material carried by the belt between the adjacent riffles thereof, a flexible belt above said riffles and filling material to close the open end of said recess, an angular portion to said brace to dispose the ends thereof in a parallel plane above the body, and a wear plate secured to the upper surface of said rifle by means extending through the rifle and plate; substantially as specified.

20. In a dry ore-concentrator, a table, an endless belt thereon, a bellows beneath said table, a driving-shaft provided with a cone-pulley, a counter-shaft provided with a corresponding cone-pulley, a driving-belt between said cone-pulleys, means for shifting said belt, and a connecting-rod extending from the bellows and connected by a slidable sleeve to the cone-pulley upon said counter-shaft eccentrically of its axis; substantially as specified.

21. In a dry ore-concentrator, a table, an endless belt thereon, a bellows beneath said table, a driving-shaft provided with a cone-pulley, a counter-shaft provided with a corresponding cone-pulley, a driving-belt between said pulleys, means for shifting said belt, a connecting-rod extending from the bellows, a sleeve-coupling to receive said rod carried by the cone-pulley upon said counter-shaft eccentrically of its axis, a worm upon the end of said driving-shaft, and a gearing extending therefrom to continuously drive said belt; substantially as specified.

22. In a dry ore-concentrator, a table, an endless belt thereon, a bellows beneath said table, a driving-shaft provided with a cone-pulley, a counter-shaft provided with a corresponding pulley, a connecting-rod extending from the bellows and adjustably connected to the pulley upon said counter-shaft eccentrically of its axis, a worm upon the end of said driving-shaft, a gearing extending therefrom to continuously drive said belt, and means for shifting the belt between the cone-pulleys to vary the speed of the bellows independently of the driving speed of the belt; substantially as specified.

23. In a dry ore-concentrator, a frame having an inclined upper portion, an inclined table supported thereon, an endless pervious belt provided with riffles, means for continuously driving said belt, a slatted top to said table, independent air-chambers beneath the upper and lower portions of said top, an adjustable relief-valve for determining the air-pressure in the upper chamber, and a hopper adapted to feed ore upon said table between the ends thereof; substantially as specified.

24. In a dry ore-concentrator, a frame having an inclined upper portion, an inclined table supported thereon, an endless pervious belt provided with riffles, means for continuously driving said belt, a slatted top to said table, independent air-chambers beneath the upper and lower portions of said top, an adjustable relief-valve for determining the air-pressure in the upper chamber, a hopper adapted to feed ore upon said table between the ends thereof, a concentrates-hopper at the upper end of the table, a driving-roller for the belt having flexible blades to discharge the material between the riffles thereof, a pan extending beneath the lower layer of the belt, and a bellows having independent compartments beneath each of the air-chambers; substantially as specified.

25. In a dry ore-concentrator, a frame having an inclined upper portion, an inclined table supported thereon, an endless pervious belt provided with riffles, means for continuously driving said belt, a slatted top to said table, independent air-chambers beneath the upper and lower portions of said top, an adjustable relief-valve for determining the air-pressure in the upper chamber, a hopper adapted to feed ore upon said table between the ends thereof, a concentrates-hopper at the upper end of the table, a driving-roller for the belt having flexible blades to discharge the material between the riffles thereof, a pan extending beneath the lower layer of the belt, and a bellows having independent compartments beneath each of the air-chambers, a dust-hopper at the lower portion of the table communicating with the lower air-chamber and with the bellows, means for adjusting the lower end of the table, and driving means for operating said belt and bellows at different speeds; substantially as specified.

26. In a dry ore-concentrator, a frame having an inclined upper portion, an inclined table supported thereon, an endless pervious belt provided with riffles, means for continuously driving said belt, a slatted top to said table, independent air-chambers beneath the upper and lower portions of said top, an adjustable relief-valve for determining the air-pressure in the upper chamber, a hopper adapted to feed ore upon said table between the ends thereof, a concentrates-hopper at the upper end of the table, a driving-roller for the belt having flexible blades to discharge the material between the riffles thereof, a pan extending beneath the lower layer of the belt, a bellows having independent compartments beneath each of the air-chambers, a dust-hopper at the lower portion of the table communicating with the lower air-chamber and with the bellows, means for adjusting the lower end of the table, means for operating said belt and bellows at different speeds; substantially as specified.
speeds, a cleaning-brush disposed above the upper face of said belt, a carrier-chain secured to supporting-bars beneath the belt, and bearing-rollers meshing with said chain for conveying the belt throughout its length; substantially as specified.

27. In a dry ore-concentrator, a frame having an inclined upper portion, an inclined table supported thereon, an endless pervious belt provided with riffles, means for continuously driving said belt, a slatted top to said table, independent air-chambers beneath the upper and lower portions of said top, an adjustable relief-valve for determining the air-pressure in the upper chamber, a hopper adapted to feed ore upon said table between the ends thereof, a concentrates-hopper beneath the upper end of the table, a driving-roller for the belt having flexible blades to discharge the material between the riffles thereof, a pan extending beneath the lower layer of the belt, a bellows having independent compartments beneath each of the air-chambers, a dust-hopper at the lower portion of the table communicating with the lower air-chamber and with the bellows, means for adjusting the lower end of the table, driving means for operating said belt and bellows at different speeds, a cleaning-brush disposed above the upper face of said belt, a carrier-chain secured to supporting-bars beneath the belt, bearing-rollers meshing with said chain for conveying the belt throughout its length, a reticulated surface above said slats in contact with which the belt travels, and a cover-plate for said dust-hopper to prevent air-pressure acting therein; substantially as specified.

28. In a dry ore-concentrator, a table, means for passing air therethrough, a pervious belt upon said table provided with riffles, a bearing-roller for said belt having blades adapted to discharge material from the belt by projecting the portion thereof between the riffles thereof, means for rotating said roller, and a concentrates-hopper beneath said roller; substantially as specified.

29. In a dry ore-concentrator, a table, a pervious belt provided with riffles and adapted to travel over said table, an air-chamber beneath said table, and means for passing an intermittent air-blast of one duration through portions of the belt at the lower portion of the table and of a different duration through portions of the belt at the upper portion thereof; substantially as specified.

30. In a dry ore-concentrator, a table, a clean-up chamber at the upper portion thereof having a slatted surface, a belt adapted to travel over said chamber and provided with riffles to close the spaces between the slats, a governing-valve for determining the air-pressure of said chamber, a spring bearing upon said valve, and an adjusting-screw to vary the pressure of said spring upon said valve; substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY M. SUTTON.
WALTER L. STEELE.
EDWIN G. STEELE.

Witnesses:
OLIVER V. STEELE,
JAMES F. DAVIES.