

(No Model.)

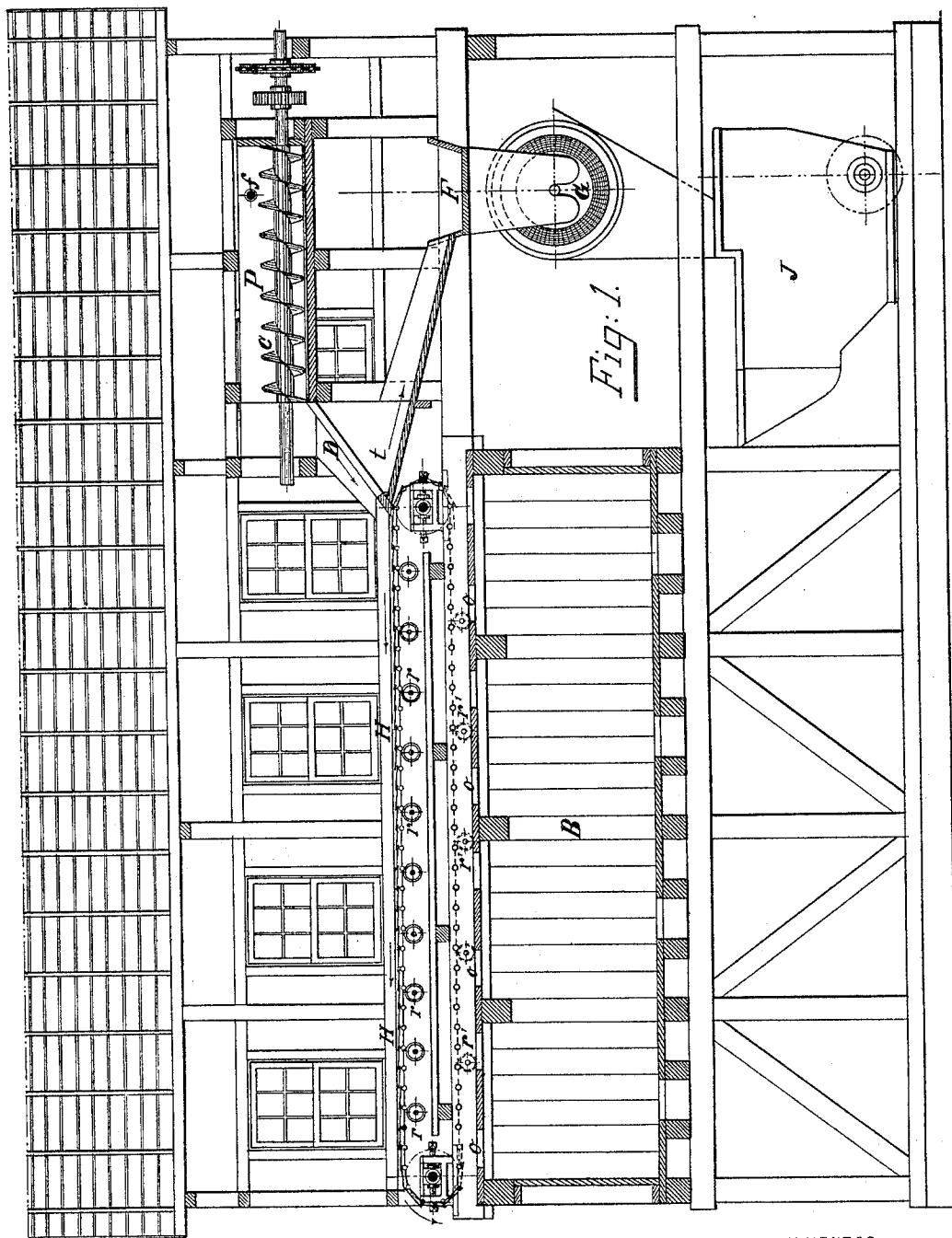
3 Sheets—Sheet 1.

S. STUTZ.

MACHINERY FOR CONCENTRATING MINERALS.

No. 581,629.

Patented Apr. 27, 1897.



WITNESSES:

John A. Kerr
James A. H. Kerr

INVENTOR

Sebastian Stutz
BY *Wm L. Pierce*

his ATTORNEY

(No Model.)

3 Sheets—Sheet 2.

S. STUTZ.

MACHINERY FOR CONCENTRATING MINERALS.

No. 581,629.

Patented Apr. 27, 1897.

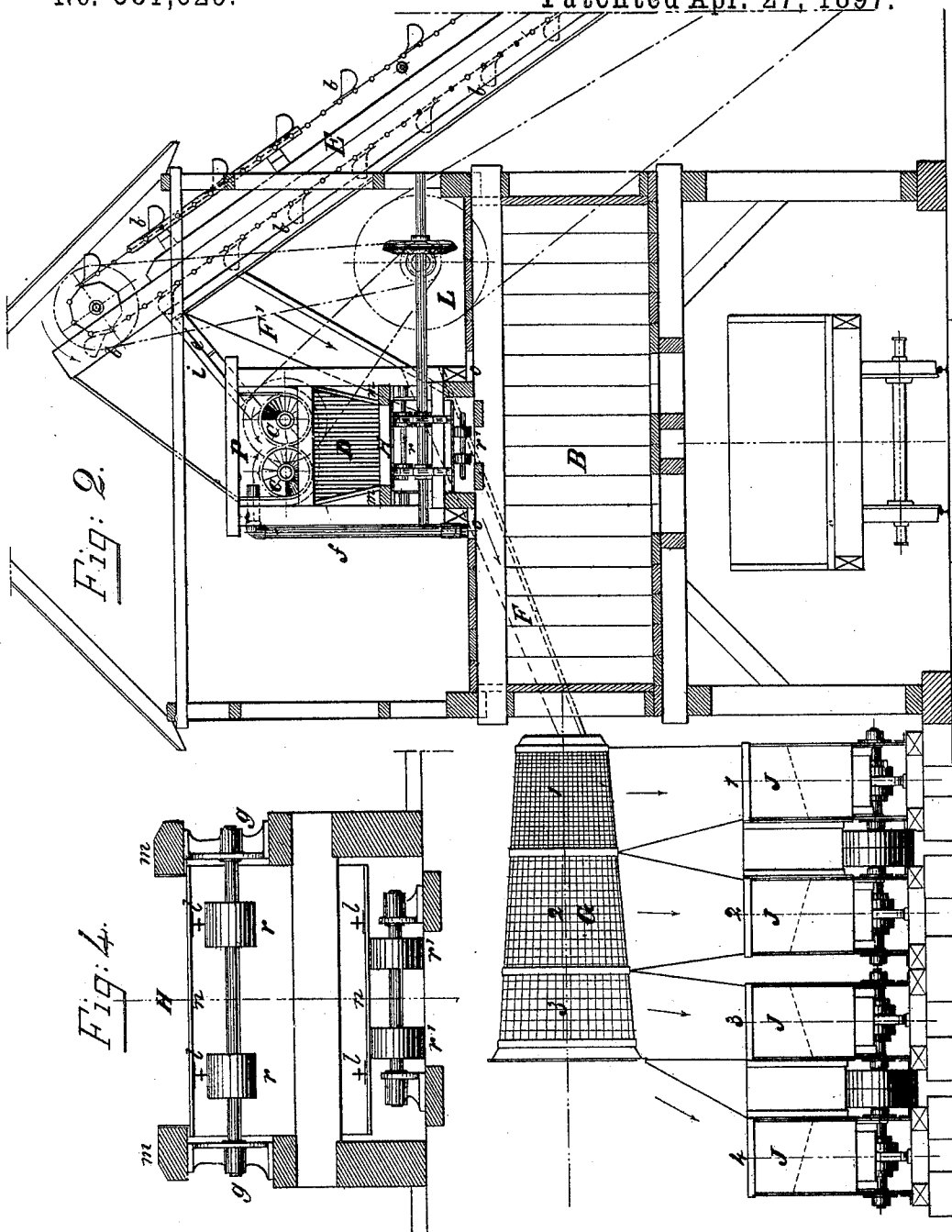


Fig. 2.

Fig. 4.

WITNESSES:

John H. Kern
James H. Kern

INVENTOR

Sebastian Stutz
BY *Wm. L. Pines*

his ATTORNEY

(No Model.)

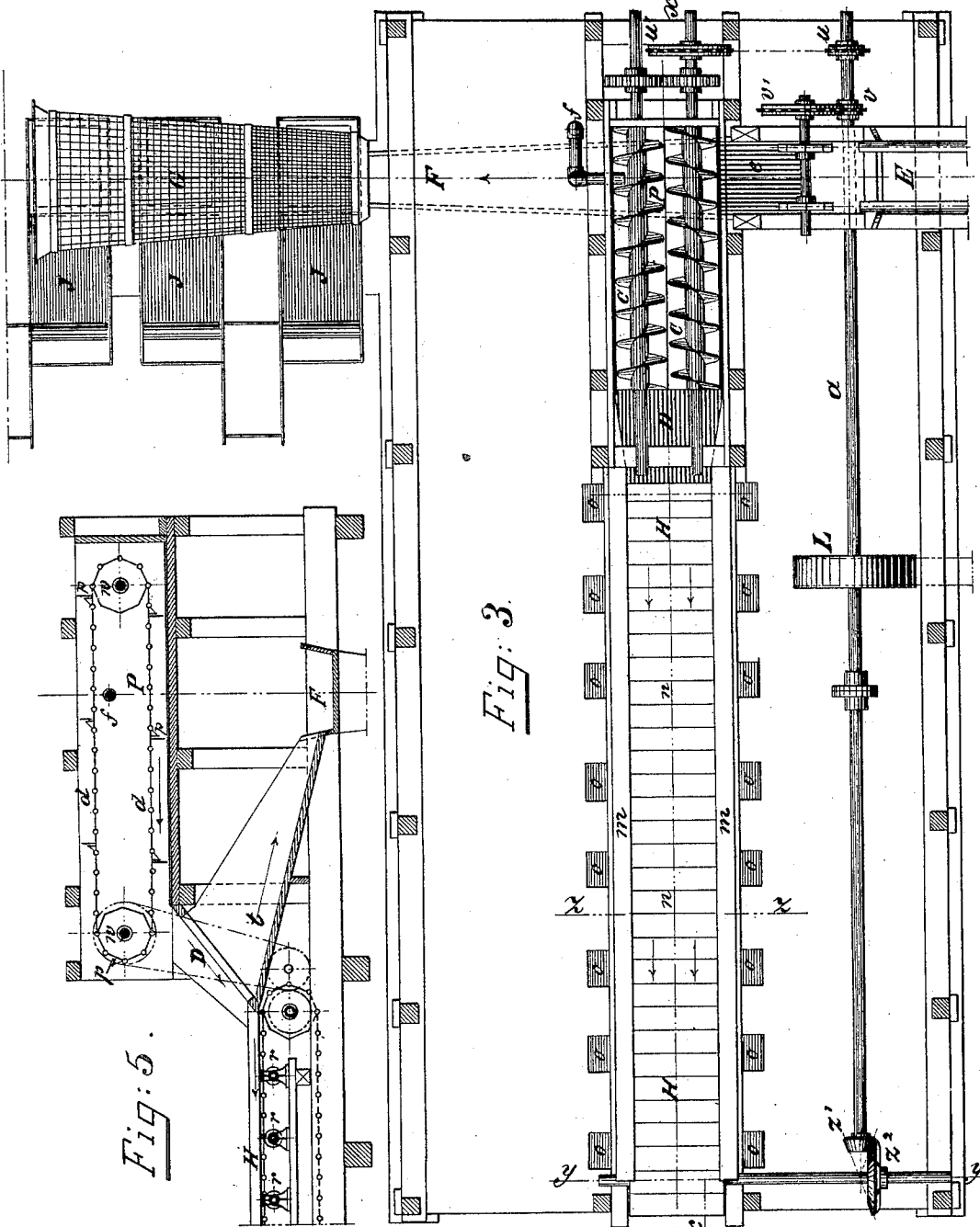
3 Sheets—Sheet 3.

S. STUTZ.

MACHINERY FOR CONCENTRATING MINERALS.

No. 581,629.

Patented Apr. 27, 1897.



WITNESSES:

John H. Kent
James A. Kean

INVENTOR

INVENTOR
Sebastian Stutz
BY Wm. L. Pierce

his ATTORNEY

UNITED STATES PATENT OFFICE.

SEBASTIAN STUTZ, OF PITTSBURG, PENNSYLVANIA.

MACHINERY FOR CONCENTRATING MINERALS.

SPECIFICATION forming part of Letters Patent No. 581,629, dated April 27, 1897.

Application filed March 2, 1891. Serial No. 383,525. (No model.)

To all whom it may concern:

Be it known that I, SEBASTIAN STUTZ, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Machinery for Concentrating Minerals, of which the following is a specification.

This invention relates to the preparing of ore, and particularly iron ore, for use in smelting-furnaces or elsewhere.

In the preparation of iron ore in accordance with the procedures now generally practiced it has been found very difficult to concentrate all the different sizes of pieces of ores economically or with profit, and as a result a great portion of the smaller pieces of ore is allowed to go to waste, thus losing a large amount of valuable material which is of a character rendering it particularly suitable for smelting, &c.

The object of the present invention is to produce suitable means whereby ore may be separated with rapidity and ease and at comparatively small cost even where the ore is in its natural or broken state, of the same general tint or color as the other matter mixed with it, and is in pieces of various sizes.

My apparatus, according to the nature and condition of the ore and its surroundings, consists of the following devices or some of them: an elevator for the mixed mineral, suitable screens, a washing pan or screen, and means, if necessary, for conveying the material through said pan or screen, a water-supply for said pan or screen, a moving hand picking-table, a classifying-screen, jigs or other separators, and devices for the driving of the moving parts of the above constructions.

My machinery has particular reference to the mixtures of iron ore and soapstone rock where the entire mass is of a uniform tint or color and where it is impossible to readily distinguish by the eye ore from rock. This unnatural color of the ore is removed by the scouring, so that it is not necessary to lift a fragment to tell its character.

The preferred form of apparatus is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of my apparatus, the section being taken on the line $x x$ of Fig. 3. Fig. 2 is a sectional view, the section being taken on the line $y y$ of Fig. 3. Fig. 3 is a plan view, a portion of the apparatus being shown removed in order to facilitate illustration. Fig. 4 is a vertical sectional view on an enlarged scale, the section being taken on the line $z z$ of Fig. 3; and Fig. 5 is a vertical sectional view of a modification of the scouring device.

In the drawings I have shown a form of apparatus designed for use in a situation where the ore, after being crushed, is to be elevated and introduced into the apparatus by which a portion of the procedure necessary to prepare the ore is carried out. To this end I employ an elevator E, extending from a dump, breaker, or other place of deposit of ore upward to a position above the first portion of the apparatus used in preparing the ore and classifying the same. Arranged in a suitable position relative to the elevator and so that the contents of the buckets of the elevator will be deposited thereon is an inclined chute i , formed of bars arranged a distance apart to allow only small pieces of ore being treated to pass between them. Below the chute i is a trough or chute F', which communicates with a second trough or chute F, leading to a suitable classifying apparatus.

The larger pieces of ore are conveyed by the chute i to a washing-pan P. This washing-pan is of any suitable length and is provided with two screw conveyers CC, having, respectively, right-hand and left-hand flights arranged to revolve in opposite directions. The result of this construction is to insure a uniform and reliable moving of the ore through the washing-pan, and therefore to obtain a uniform delivery of the ore after being treated in the pan.

The water necessary to the operation of the pan is supplied by the pipe f , connected with a suitable source of water-supply and regulated by a valve in the pipe f . At the outlet end of the washing-pan P, I arrange an inclined screen D to serve both as a conveyer and to separate the finer from the coarser pieces. The small pieces of ore and water

pass through the meshes of the screen into a trough *t* and thence by the trough or conveyor *F* into a classifying-screen *G*.

The classifying-screen is designated by the letter *G* and is composed of sections having meshes of different sizes, the meshes of the section at the receiving end being smallest and those of the other sections increasing in size toward the discharge end of the screen.

Below each screen is a hopper leading to a jigger *J*. These jiggers are numbered, respectively, 1, 2, 3, and 4, and each receives the substance from that section of the screen immediately above it. In the present illustration I have shown one jigger for each section of the screen for receiving the ore after passing through the screen, but the number of sections of the screen and the number of jiggers employed may be varied at will to suit the requirements of the ore being worked upon.

The coarser particles of the ore are conveyed down the screen *D* and discharged upon an endless picking-table *H*, which is arranged to move slowly to allow the pickers, stationed on each side, opportunity for separating the ore to be retained. Below the table is arranged a bin *B*, having openings *o* situated at suitable distances apart, through which openings the ore picked from the table is dropped into the bin. The waste, rock, dirt, &c., remaining on the table is carried to the end and there discharged upon a waste-heap or into cars or carts for conveying it away.

Any suitable construction of picking-table *H* may be employed, but in the present instance I have shown it as composed of endless chains *l l* and sheet-metal plates *n n*, fixed to the links of the chains. Guide-rollers *r r* are used to guide both the upper loaded portion of the table and the lower empty portion. The brackets *g g* support the top rollers *r r* and also the sides *m m* of the table. These sides are made to overlap

the plates *n n*, thus affording means whereby accident to the pickers is prevented and also means for preventing pieces of ore from falling off.

Motion is imparted to the moving parts of the machinery by driving-pulley *L*, shaft *a*, beveled gears *z' z'* for the table, chain-wheels *v v'* for the elevator, and wheels *u u'* for the screw conveyers of the washing-pan.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an ore-concentrating pan, a picking-table having an endless moving belt, stationary rollers guiding both upper and lower parts of said table, brackets supporting the stationary rollers, and sides for the table supported upon the brackets and overlapping the carrying-surfaces of the table, substantially as described.

2. In an apparatus for concentrating ore, the combination of a conveyor extending from the place of deposit, an inclined chute adjacent to the conveyor, a trough *F'* connected with the conveyor by the said chute, a classifying-screen, a trough *F* connecting the trough *F'* and the classifying-screen, a washing-pan provided with screw conveyers, and connected with the elevator by the inclined chute, an inclined screen arranged at the outlet end of the washing-pan, a trough *t* adjacent to the said screen and communicating by the trough *F* with the classifying-screen, hoppers arranged below the classifying-screen, jiggers below the hoppers, and an endless picking-table adjacent to the inclined screen, substantially as described.

In testimony whereof I have hereunto set my hand this 25th day of February, A.D. 1891.

SEBASTIAN STUTZ.

Witnesses:

WM. L. PIERCE,
J. N. COOKE.