(No Model.)

G. CONKLING.

PROCESS OF TREATING MAGNETIC IRON ORE.

No. 401,414. Patented Apr. 16, 1889.

Fig. 3.

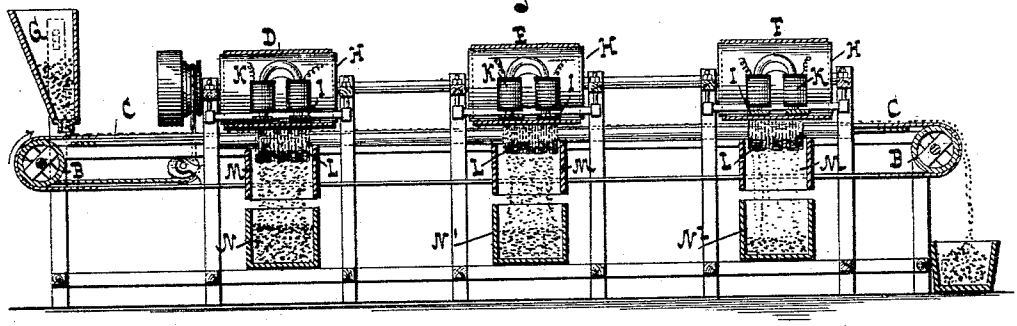


Fig. 2.

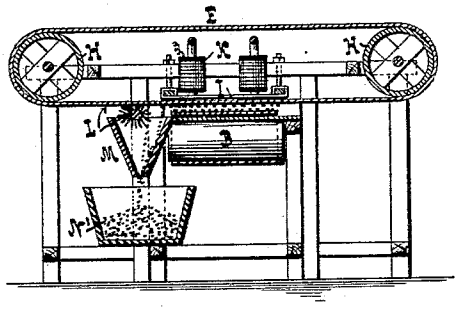
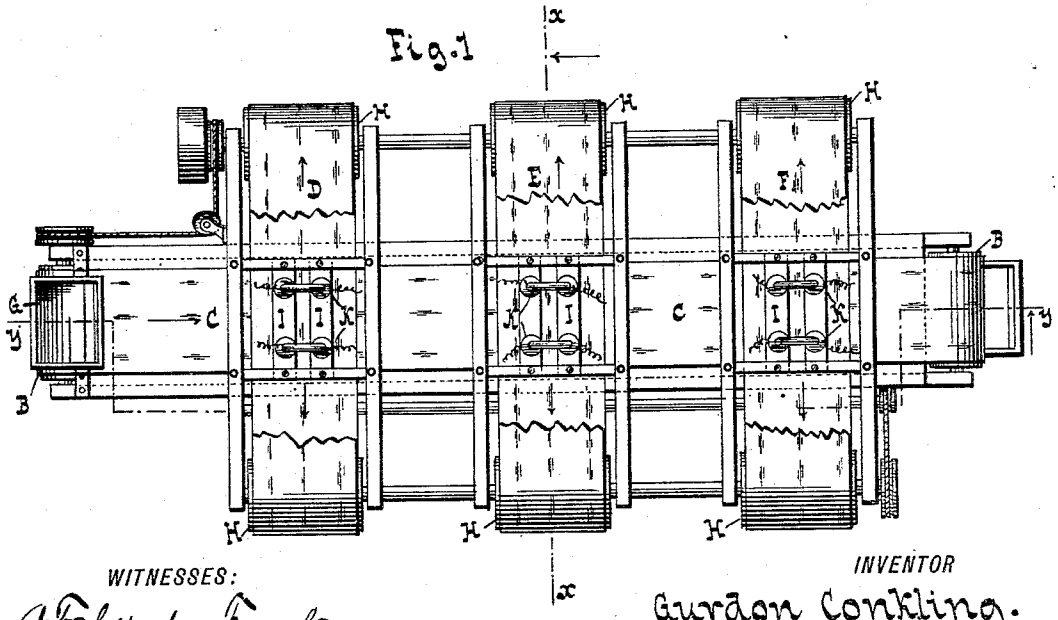


Fig. 1



WITNESSES:

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PROCESS OF TREATING MAGNETIC IRON ORE.

SPECIFICATION forming part of Letters Patent No. 401,414, dated April 16, 1889.

Application filed July 31, 1888. Serial No. 281,495. (No model.)

To all whom it may concern:

Be it known that I, GURDON CONKLING, a citizen of the United States, residing at Glens Falls, in the county of Warren and State of New York, have invented new and useful Improvements in the Process of Treating Magnetic Iron Ores, of which the following is a specification.

This invention relates to a process in which magnetic iron ores after having been crushed are exposed to the action of a succession of magnets of graduated intensity in relation to the mass exposed to their action, so that the magnet or magnets having the smallest intensity attract the particles richest in iron, the magnet or magnets of greater intensity the particles contaminated with a small quantity of impurities, and so on.

In the accompanying drawings I have illustrated an apparatus which can be used in carrying out my invention.

In the drawings, Figure 1 represents a plan or top view. Fig. 2 is a transverse vertical section in the plane *x x*, Fig. 1. Fig. 3 is a longitudinal vertical section in the plane *y y*, Fig. 1.

Similar letters indicate corresponding parts.

In the drawings, the letter G designates a hopper through which the crushed or concentrated ore is fed to the conveyer C. In the example shown in the drawings this conveyer consists of an endless belt which runs over drums B B, and to which motion is imparted by any suitable mechanism; but said conveyer may be made in the form of an inclined trough over which the ore slides down. Over the conveyer C are shown three endless belts, D E F, which run transversely to the conveyer and extend over drums H H, to which motion is imparted by any suitable mechanism. With each of the transverse belts D E F is combined a magnet of graduated intensity in relation to the mass of ore on the conveyer. In the example shown in the drawings these magnets are made in the form of plates I I, which are magnetized by means of electro-magnets K, and the magnetized plates of the transverse belt D are placed at a greater distance from the conveyer C than the magnetized plates of the transverse belt E, while the magnetized plates of the transverse belt F are at a smaller distance from the conveyer than the magnetized plates of the transverse belt E. Consequently the intensity of the action produced by the magnets of the transverse belt D upon the mass of ore on the conveyer C is smaller than the intensity of action of the magnets of the transverse belt E, and the intensity of the action of the magnets of the transverse belt F is still smaller. The various magnetized plates may, however, be placed at the same distance from the conveyer C, and in this case their intensity of action is graduated by the force of the electric currents which serve to magnetize the different sets of plates, said currents being so gaged that the magnets of the transverse belt D will be the weakest and those of the transverse belt F the strongest. The magnets of the transverse belt D, having the smallest intensity in relation to the mass on the conveyer C, attract the pure iron particles contained in said mass, so that the same adhere to the transverse belt D and are deposited by the same in a suitable receptacle, N, as indicated in Figs. 1 and 2. The magnets of the transverse belt E, having a larger intensity in relation to the mass of ore on the conveyer than the magnets of the transverse belt D, attract iron particles contaminated with a small quantity of impurities, so that the same are carried by the transverse belt E and deposited into the receptacle N′, as shown in Fig. 2, a brush, L, being provided which sweeps off the iron particles adhering to the transverse belt and causes them to drop into a hopper, M, which conducts the same into the receptacle N′. The magnets of the transverse belt F, having a still greater intensity than the magnets of the transverse belt E, attract iron particles contaminated with more impurities than those attracted to the transverse belt E, and the iron particles attracted to the transverse belt F are collected in the receptacle N².

It will be seen from this description that by exposing the crushed ore to the action of a succession of magnets of graduated intensity in relation to the mass exposed to the action of the magnets the purest iron particles contained in the mass are attracted by the first magnet, which has the smallest intensity in regard to the mass under treatment, while the

second magnet attracts iron particles of less purity than the first, and so on, and by these means the mass of the ore is divided into portions, the first one of which contains only pure or almost pure iron, while the second is composed of particles of less purity than the first, and so on.

It is self-evident that in carrying out my invention permanent magnets may be used in place of the magnetized plates I I, (shown in the drawings,) and since these plates when magnetized practically become magnets I have used the term "magnets" to include permanent magnets as well as magnets produced by the action of electricity.

What I claim as new, and desire to secure by Letters Patent, is—

The process for treating magnetic iron ore, which consists in exposing the ore after having been crushed to the action of a succession of magnets of graduated intensity in relation to the mass exposed to their action, and finally collecting the iron particles attracted by the several magnets in separate heaps or receptacles, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

GURDON CONKLING. [L. S.]

Witnesses:
W. C. HAUFF,
E. F. KASTENHUBER.