(No Model.) 2 Sheets—Sheet 1.

H. P. J. KESSLER.

ELECTRO MAGNETIC APPARATUS FOR SEPARATING ORES.

No. 345,383. Patented July 13, 1886.

Fig. 1.

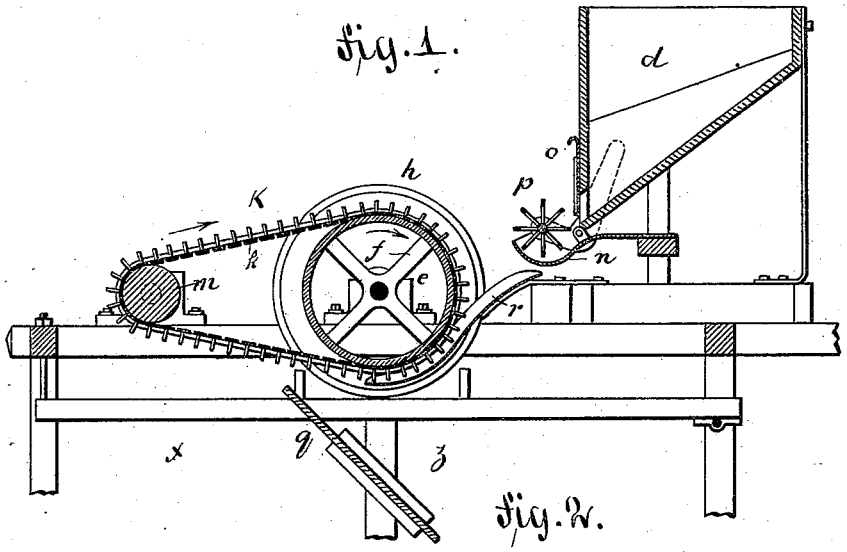
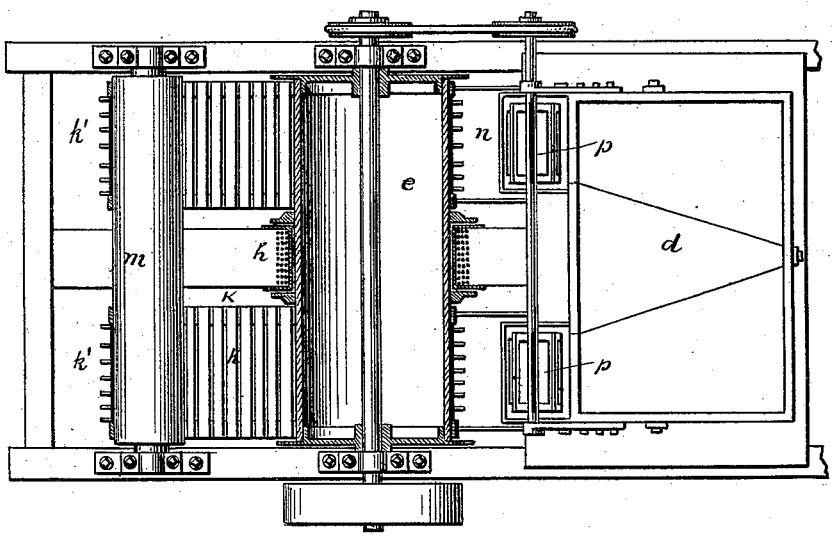


Fig. 2.



WITNESSES:

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BY Goepel & Raegener

his ATTORNEYS

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

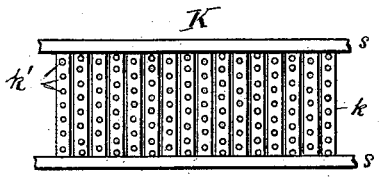
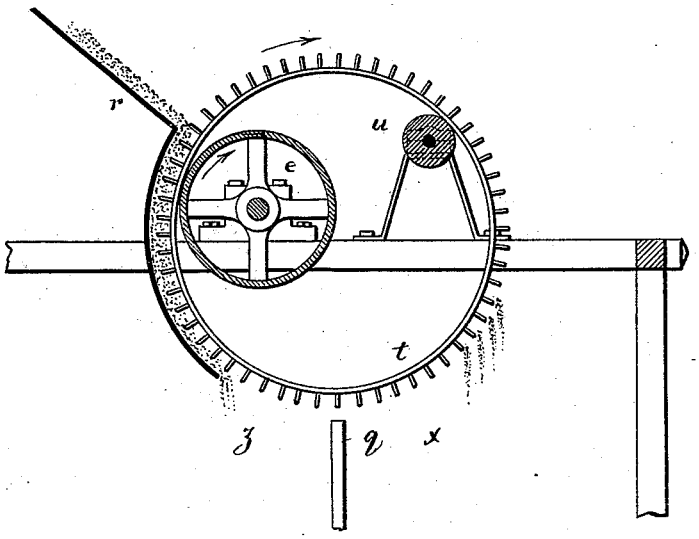


Fig. 4.



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UNITED STATES PATENT OFFICE.

HEINRICH PHILIPP JAKOB KESSLER, OF OBER LAHNSTEIN, PRUSSIA, GERMANY.

ELECTRO-MAGNETIC APPARATUS FOR SEPARATING ORES.

SPECIFICATION forming part of Letters Patent No. 345,383, dated July 13, 1886.

Application filed March 27, 1886. Serial No. 196,717. (No model.) Patented in Germany April 12, 1885, No. 33,587.

To all whom it may concern:

Be it known that I, HEINRICH PHILIPP JAKOB KESSLER, a subject of the King of Prussia, German Empire, residing at the city of Ober Lahnstein, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Electro-Magnetic Apparatus for Separating Ores, (for which German Letters Patent No. 33,587, were issued on April 12, 1885,) of which the following is a specification.

The object of my invention is to provide a new and improved electro-magnetic machine for separating particles of iron from ore; and the invention consists in the combination, with a drum which is magnetized by an electro-magnet connected with a suitable battery or dynamo-electric machine, of an endless belt or carrier passed around said drum, and provided with pins which are passed through the pulverized ore, the particles of iron adhering to the pins, which are magnetized, and which pins are then demagnetized, causing the particles of iron to drop from them, all as will be described and set forth hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a longitudinal sectional elevation of my improved electro-magnetic machine for separating ores. Fig. 2 is a sectional plan view of the same. Fig. 3 is a face view of one of the endless carriers or belts carrying the pins. Fig. 4 is a cross-sectional view of a modification of the machine.

Similar letters of reference indicate corresponding parts.

On a suitable shaft the spider frames or arms *f*, preferably made of brass, are fastened, and on the same the cylinder *e*, made of sheet or cast iron, is fixed, which cylinder is surrounded at its middle or at the ends by an insulated wire coil, *h*, forming an electro-magnet, the ends of said coil being connected with a battery or dynamo-electric machine, the said coil being fixed and the drum or cylinder revolving in the same. At the sides of the said coil endless belts K are passed over the drum *e*, and over a wooden roller, *m*, at some distance from the drum *e*. Said endless belts consist of the straps *s*, united by transverse strips *k*, of metal, from the outer sides of which the iron pins or pegs *k'* project, as shown in Fig. 3.

For the purpose of preventing the magnetization of the strips K after they have been passed over the drum, some of the strips *k* at suitable intervals are made of brass.

The pulverized ore is placed into a hopper, *d*, having an inclined bottom, at the lower edge of which the sliding door *o* is provided, and below said door a gutter, *n*, is arranged, in which an agitator, *p*, is mounted to revolve, said agitator being driven from the shaft of the drum *e*. The agitator *p* throws the pulverized ore from the gutter into a guide, *r*, which is arranged in close proximity to the endless belts K, so that the pins *k'* of the belt pass into the pulverized ore in the guide *r*. An inclined partition, *q*, is held adjustably below the drum *e*. The pins *k'* are magnetized as they pass over the drum *e*, and as they pass through the pulverized ore attract all the particles of ore, &c. The pulverized ore drops upon the partition *q*, and slides over the same into the compartment *z*, whereas the particles of ore that adhere to the pins *k'* are carried over the top of the partition *q* and drop into the compartment *x* as soon as the pins lose their magnetism, which takes place a greater or less distance from the drum *e*. The partition *q* is so adjusted that its upper edge is near to the point where the pins begin to lose their magnetism.

In the construction shown in Fig. 4 the endless belts are replaced by a brass ring or roller, *t*, from which pins *k'* project, said ring resting on the drum *e*, and on the wooden roller *u*. For smaller machines the pins *k'* may be replaced by permanent magnets, and in these machines the drum *e* and the wire coil forming the electro-magnet on the same may be dispensed with. The operation is similar to that of the machine shown in Fig. 1. If desired, the roller *t* may be provided with an axis in place of resting on the drum *e*.

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

1. In a machine for separating magnetic particles of ore from non-magnetic particles, the combination, with a rotary drum or cylinder surrounded by a fixed wire coil forming an electro-magnet, of an endless belt or ring pro-

vided with pins, which are magnetized by the drum or cylinder surrounded by the coil forming the electro-magnet, and of a roller over which said ring or belt runs, substantially as set forth.

2. In a machine for separating magnetic particles of ore from non-magnetic particles, the combination, with a rotary drum or cylinder surrounded by a fixed coil forming an electro-magnet, of a cylinder at some distance from the drum, an endless belt provided with pins, which pins are magnetized by the drum or cylinder surrounded by the coil forming the electro-magnet, a hopper, and an agitator in said hopper, and mechanism for operating the agitator from the shaft of the drum, substantially as set forth.

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

HEINRICH PHILIPP JAKOB KESSLER.

Witnesses:

HEINRICH JACOB SONTAG,

JOSEPH SCHERER.