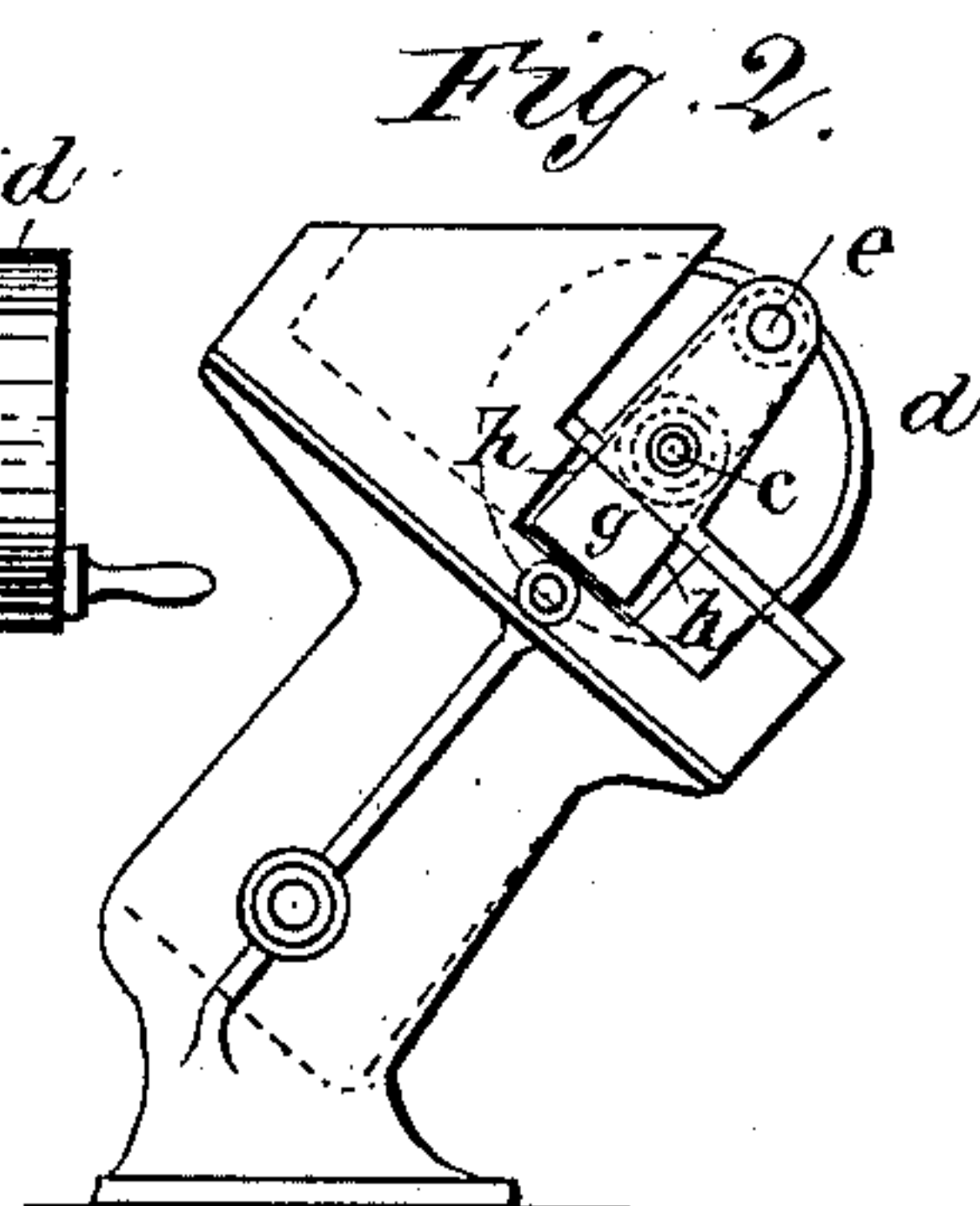
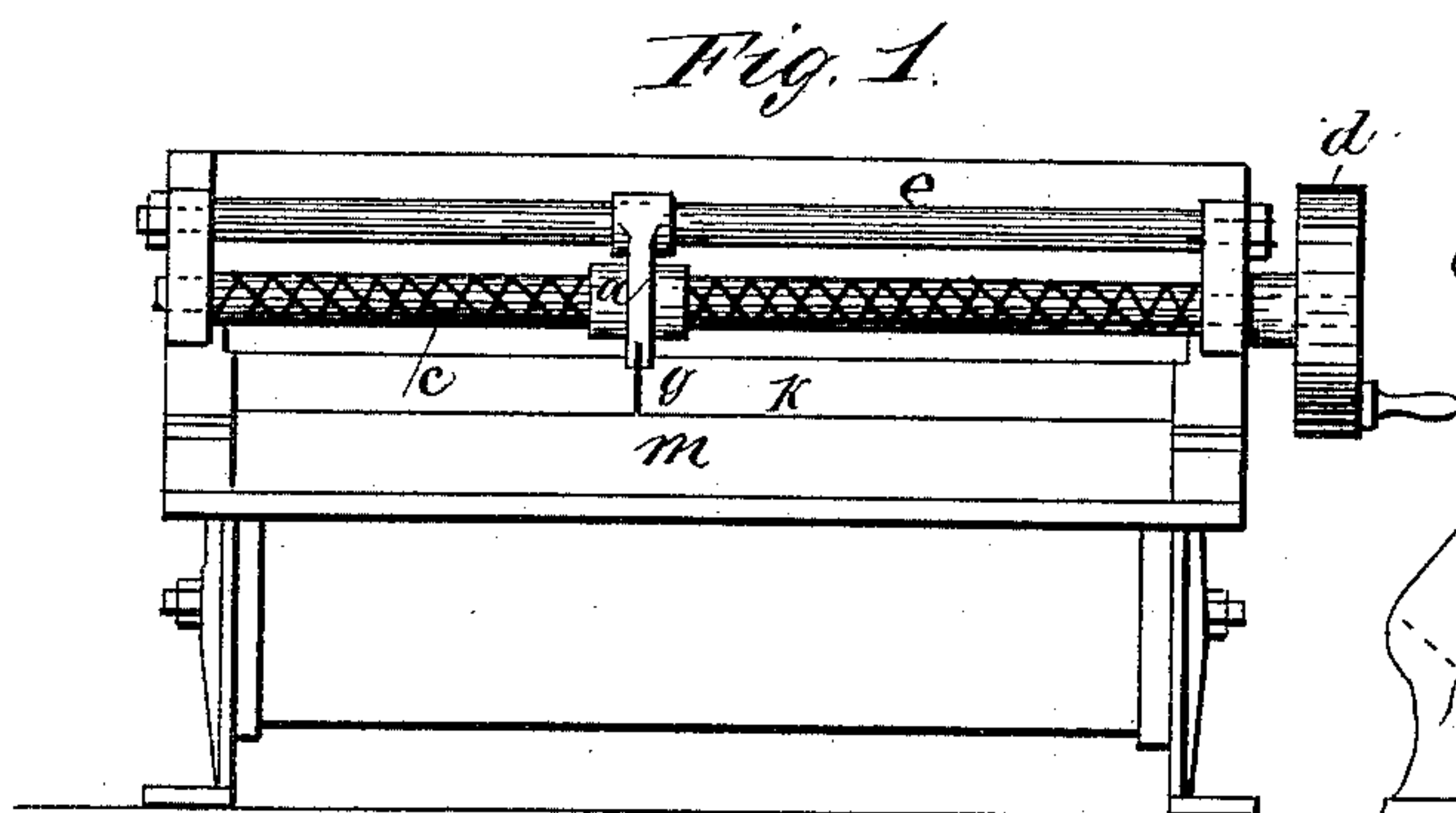
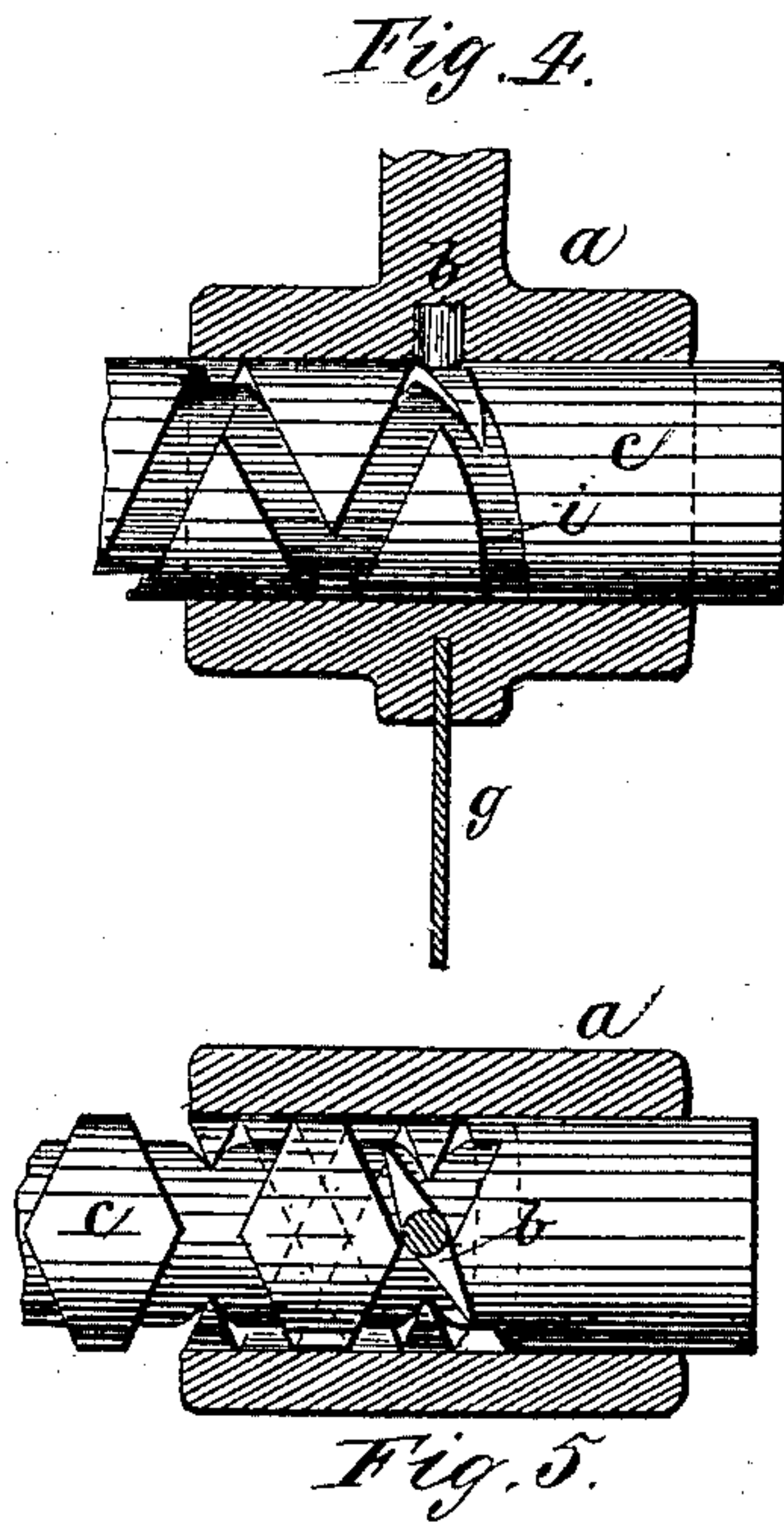
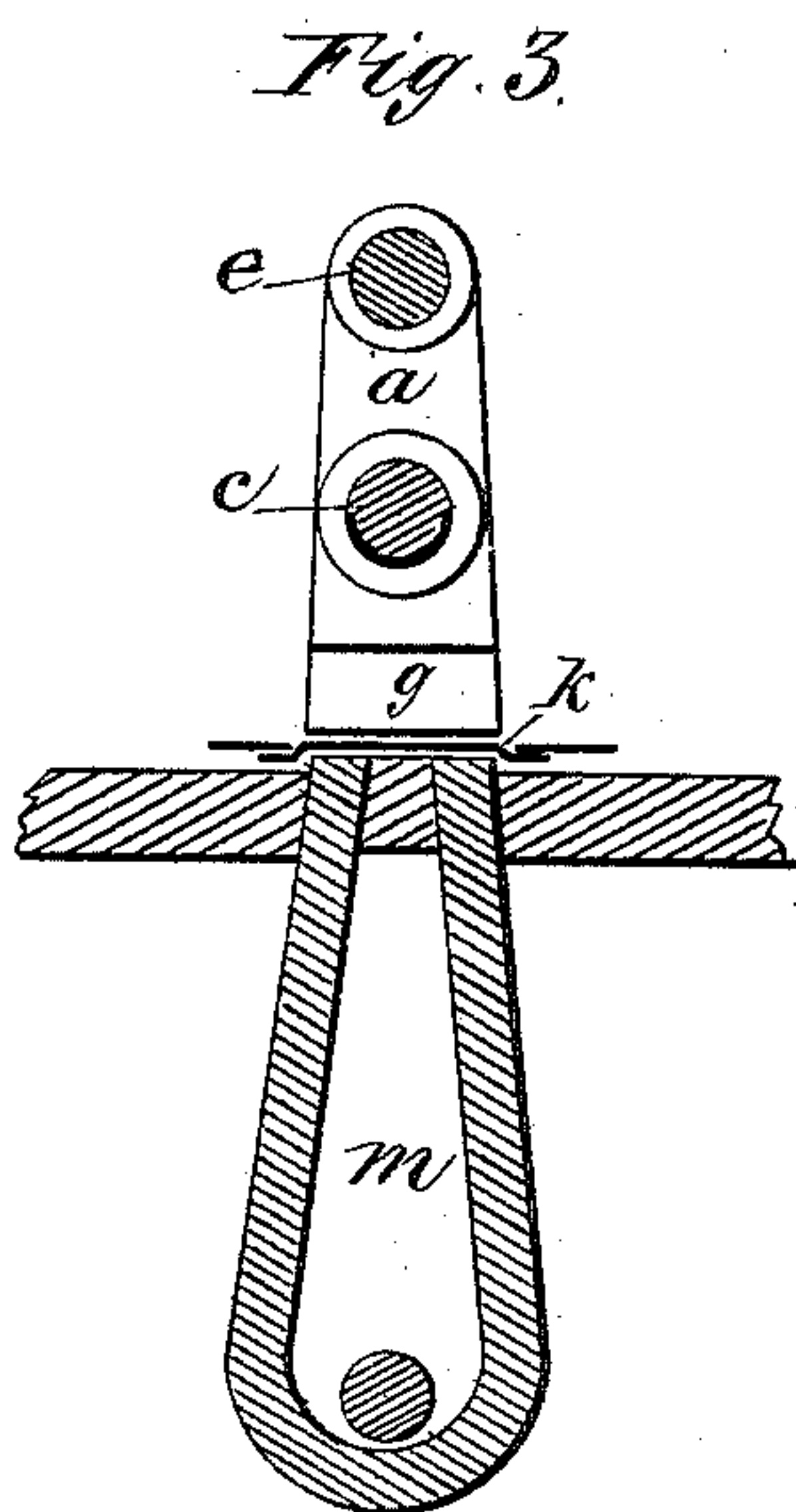


(No Model.)

G. SCHAEFFER.
MAGNETIC SEPARATOR.

No. 339,017.

Patented Mar. 30, 1886.



Witnesses.
O. E. Goulter
Paul W. Knobloch.

Inventor
Gottlob Schaeffer
per Henry C. C. Co.
his atty.

UNITED STATES PATENT OFFICE.

GOTTLOB SCHAEFFER, OF GÖPPINGEN, WÜRTEMBERG, GERMANY.

MAGNETIC SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 339,017, dated March 30, 1886.

Application filed May 1, 1884. Serial No. 129,937. (No model.) Patented in Germany April 9, 1884, No. 29,748.

To all whom it may concern:

Be it known that I, GOTTLOB SCHAEFFER, a subject of the King of Würtemberg, residing at Göppingen, Würtemberg, German Empire, have invented certain new and useful Improvements in Magnetic Separators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in machines for separating metallic particles from grain by magnetic attraction; and it consists, first, in the combination, with the frame of the apparatus provided with discharge-openings at its opposite ends, the magnets, and a non-magnetic conveying-surface applied over the poles of the magnets on a line with said discharge-openings, of a reciprocating wiper and reversing devices for automatically reversing the traversing motion of the wiper, substantially as hereinafter described; second, in the combination, with the frame of the separator having discharge-openings in its opposite ends, the magnets, the non-magnetic conveying-surface, a guide-rod, the wiper, its stock, and a reversing dog arranged in said stock, of a shaft having right and left hand screw-threads, and means for rotating said shaft, said parts being constructed and operated substantially as hereinafter described.

In the accompanying drawings, Figure 1 shows a grain-separator embodying my improvements in front elevation. Fig. 2 is an end elevation thereof, and Figs. 3, 4, and 5 are detail views.

Like letters of reference indicate like parts wherever such may occur in the above figures of drawings.

The magnets *m* are arranged parallel to each other, so that their polar ends form an inclined plane over which the grain is caused to pass, an arrangement that is well known in this class of machines. When so arranged, the particles of metal attracted are magnetized, which results in a gradual loss of magnetic power in the magnets. To obviate this, and also to provide a perfectly plane and smooth

surface, I cover the polar ends of the magnets with some non-magnetic material, preferably metal—as sheet brass, as shown at *k*, Fig. 3—thus forming a non-magnetic conveying-surface over which the grain moves. Over this non-magnetic shield is moved a wiper in any desired or preferred manner.

In the drawings I have shown mechanism for imparting a traversing motion to the wiper, combined with means for automatically reversing said motion, said mechanism being constructed and operated as follows: The wiper is composed of a strip of preferably elastic sheet metal, *g*, which is clamped or otherwise secured to a stock, *a*, mounted on and traversed by a right and left threaded screw-shaft, *c*, and guided in its movements on a bar or rod, *e*. In the bore of the stock through which the screw-shaft *c* passes is pivoted a wedge-shaped dog or tooth, *b*, that fits the threads of the screw-shaft, as shown in Figs. 4 and 5, so that said stock is moved along the screw-rod when the latter is rotated, the rod *e* holding the stock against rotation on the screw-shaft. The threads or paths of the screw run in opposite directions and intersecting each other, their terminals merging into each other and forming a reversing path, *i*, Fig. 4, so that when the wiper or scraper *g* reaches the limit of its traversing motion in one direction its movement will be automatically reversed. The driving-pulley *d* on the screw-shaft may therefore be rotated in one or the other direction to operate the wiper or scraper, and said screw-shaft may, if desired, be rotated by hand. The wiping or scraping plate *g* is on a line parallel with the direction of motion of the grain through the machine, and its traversing motion over the pole ends of the magnets, or over the non-magnetic surface *k*, with which said pole ends are covered, is at right angles to the path of the grain.

It is obvious that the metallic particles attracted at the metallic poles and adhering thereto or to the non-metallic shield therefor are gradually carried toward one or the other end of the machine, according to the direction of motion of the wiper or scraper, and as the latter reaches the limit of its traversing motion in either direction said metallic particles are swept into openings *h*, Fig. 2, at the ends of the machine, from which openings they fall

either to the ground or into a suitable receptacle provided therefor.

As the openings for the discharge of the metallic particles are at the ends of the machine, said particles of metal are not liable to again mix with the grain passing out of the front of said machine.

It is obvious that by employing a wiper composed of a strip of elastic sheet metal and arranging said wiper with its vertical or lateral edges parallel with the line of motion of the grain the said wiper will not impede the passage of the grain over the magnetic field, and said wiper may be brought in frictional contact with the magnetic field to more effectually remove small particles of metal. These results cannot well be obtained when a rigid wiper is employed, or, as has been the case generally, a right-angled rigid wiper, which construction of wiper tends to carry along a considerable amount of grain, carry the same toward the ends of the machine, and impede the passage of the grain over the magnetic field.

It is also obvious that by means of the described mechanism for automatically traversing the wiper over the magnetic field less attention is required during the function of the separator than is the case when the reversing of the traversing motion is effected by hand.

I am aware that mechanism for converting continuous rotary into continuous reciprocating motion is not new, nor do I wish to claim such, broadly. I am not aware, however, that such mechanism has heretofore been applied to the wipers of this class of machines.

I do not desire to claim herein, broadly, a non-magnetic conveying surface or shield applied over the poles of the magnets, as I am aware that such has previously been done in

machines for separating ores and mineral products; but I am not aware that such a surface has previously been applied to a grain-separator and combined with a reciprocating wiper.

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

1. In a magnetic grain-separator, the combination, with the frame of the separator having openings *h* at its opposite ends, the magnets *m*, and a non-magnetic conveying surface or covering, *k*, applied over the poles of the magnets on a line with said end openings, *h*, of a reciprocating wiper arranged to traverse over the non-magnetic conveying-surface *k* and sweep the metallic particles adhering thereto into one of the openings *h* at each reciprocation, and reversing devices for automatically reversing the traversing motion of the wiper at each reciprocation, substantially as and for the purposes specified.

2. In a magnetic grain-separator, the combination, with the frame of the separator having openings *h* in its opposite ends, the magnets *m*, the non-magnetic conveying-surface *k*, the guide-rod *e*, the wiper *g*, its stock *a*, and the reversing-dog *b*, arranged in said stock, of the shaft *c*, having right and left handed screw-threads, and means for rotating said shaft, said parts being constructed and operated substantially as described, and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

GOTTLOB SCHAEFFER.

Witnesses:

TH. WENHEIM,
ROSINA YÄDEL.