(No Model.) 2 Sheets—Sheet 1.

J. P. CONKLING.

MAGNETIC ORE SEPARATOR.

No. 451,369. Patented Apr. 28, 1891.

Fig. 1.

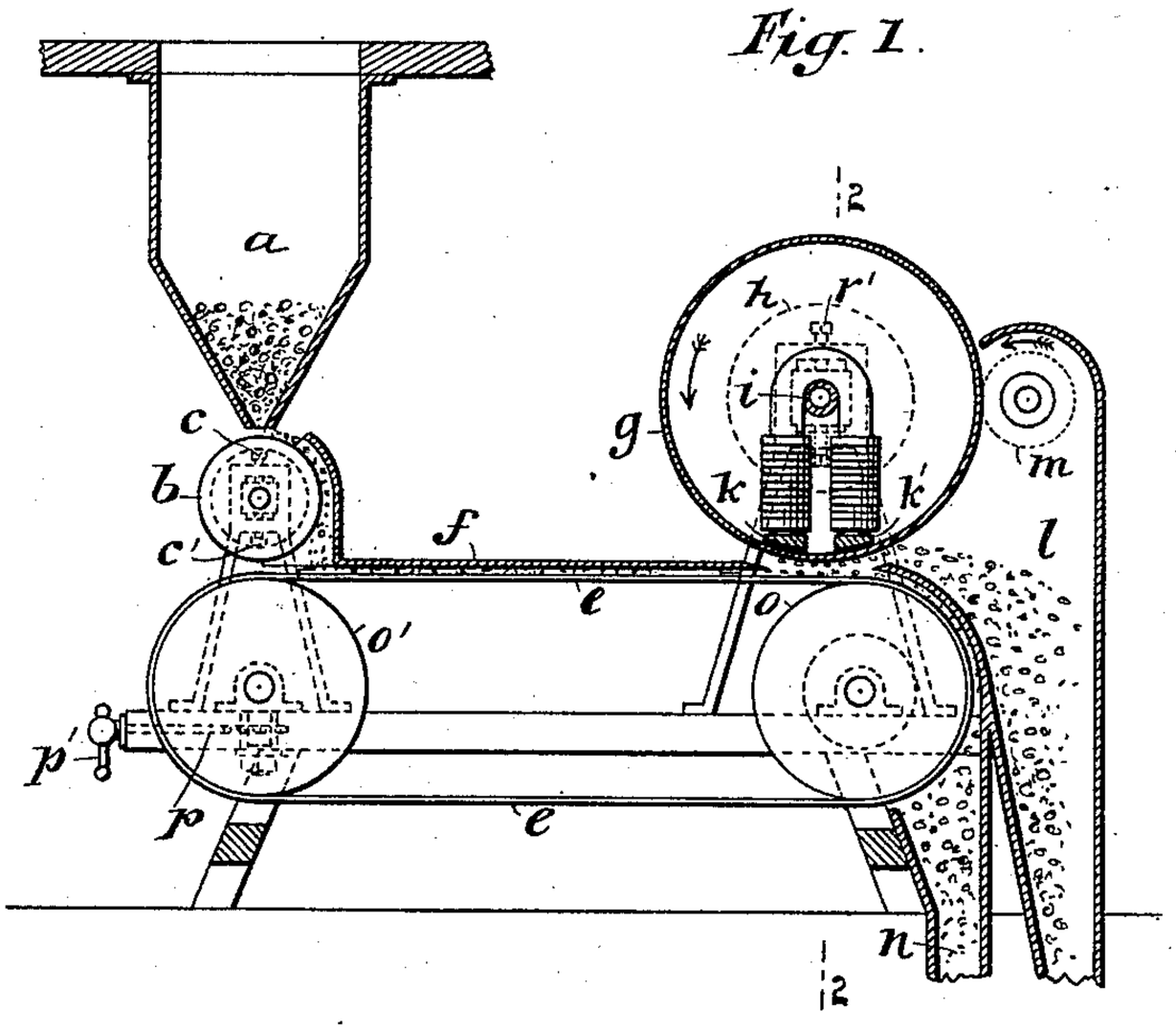
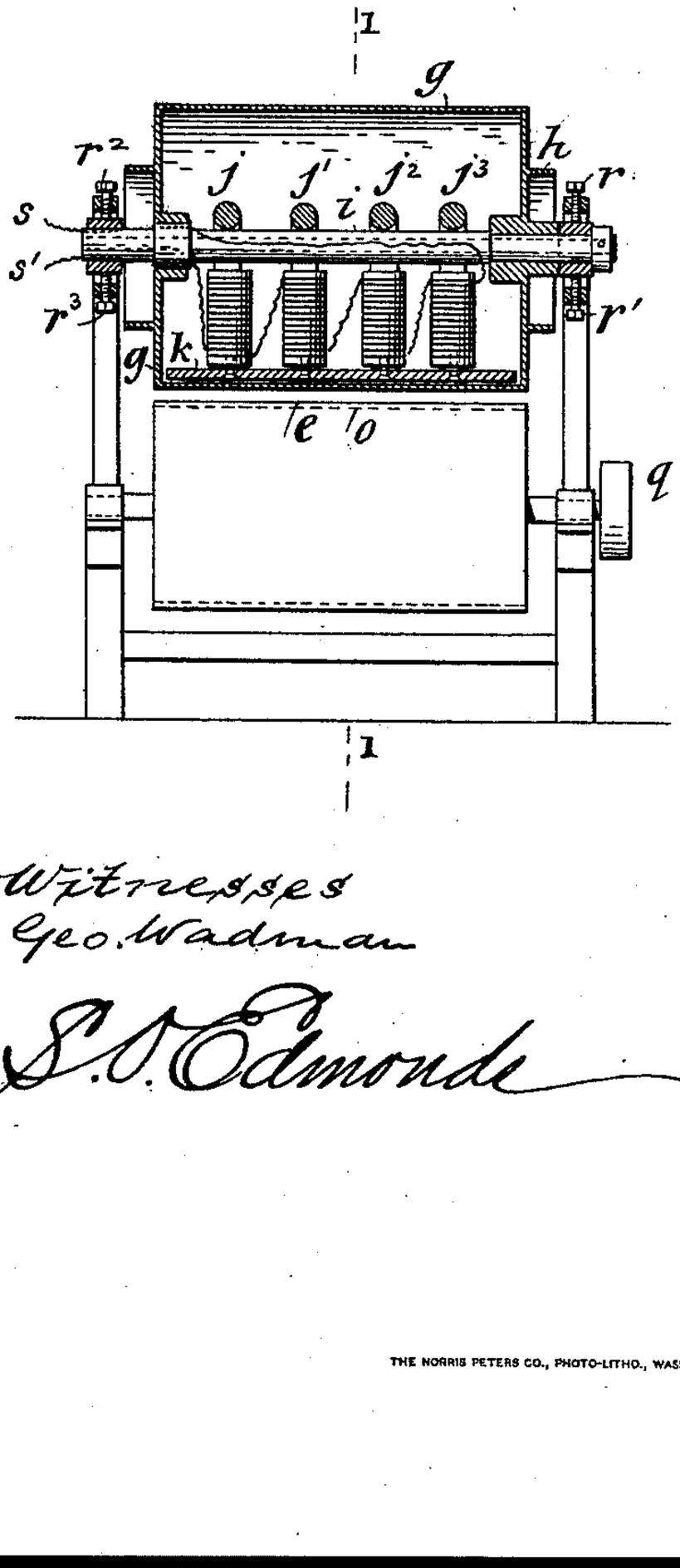


Fig. 2.



Witnesses
Geo. Wadman
S. S. Edmonds

Inventor
John P. Conkling
By his attorneys
Gifford & Brown

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

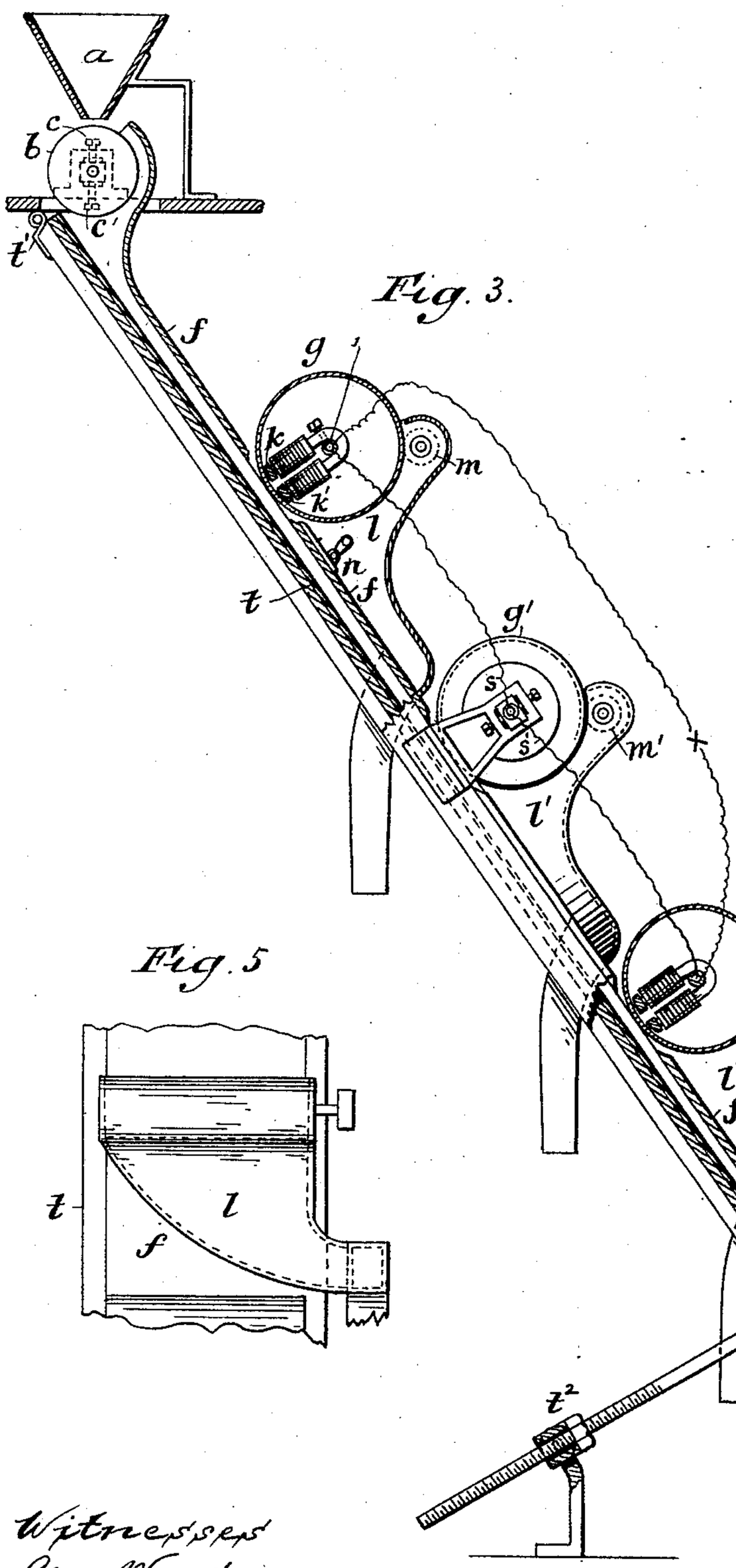

Fig. 4.

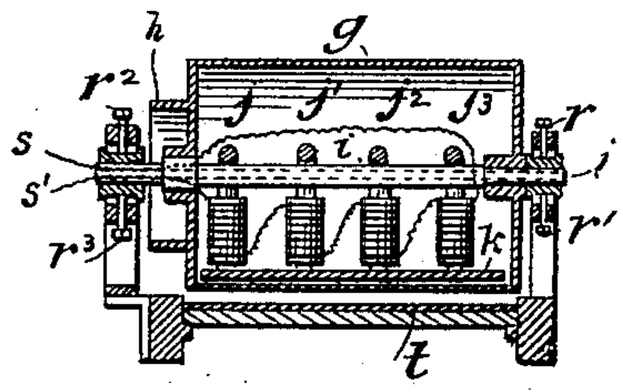

Fig. 5

Witnesses
Geo. Wadman
S. V. Edmonds

Inventor
John P. Conkling
By his attorneys
Gifford & Brown

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN P. CONKLING, OF NEW YORK, ASSIGNOR TO GURDON CONKLING, OF GLENS FALLS, NEW YORK.

MAGNETIC-ORE SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 451,369, dated April 28, 1891.

Application filed August 7, 1889. Serial No. 319,980. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. CONKLING, of New York, in the county and State of New York, have invented a new and useful Improvement in Machines for Concentrating and Dephosphorizing Magnetic Iron Ore, of which the following is a specification.

The object of my improvement is to provide a machine in which the magnetic ore will be thoroughly, economically, and conveniently separated from the gangue or tailings.

In the accompanying drawings I have shown an apparatus embodying my invention; but I do not wish to be understood as confining myself to the particular form of apparatus shown.

Figure 1 is a longitudinal section of the machine through the line 1 1, Fig. 2. Fig. 2 is a cross-section of the machine through the line 2 2, Fig. 1. Fig. 3 is a longitudinal section of a modification. Fig. 4 is a cross-section of the same. Fig. 5 is a detail.

a, Fig. 1, is a hopper containing an oblong discharge-opening at the bottom, which discharges over the revolving cylinder *b*, which is adjustable vertically by means of the set-screws *c c'*, so as to increase or diminish the available opening for the discharge of the ore from the hopper *a*. The ore falls off the revolving cylinder *b* onto the conveyer-belt *e*, by which it is carried along under the cover *f* until it comes below the hollow cylinder *g*, of brass or other non-magnetic material. This cylinder is mounted upon a hollow stationary shaft *i*, upon which it may be revolved by the pulley *h*. Within the cylinder and mounted upon the stationary shaft *i* are the stationary electro-magnets *j j' j² j³*, having the pole-pieces *k k'* connected with each of said magnets and arranged close to the interior surface of the cylinder *g*, immediately above the conveyer-belt *e*. When the original ore is carried below this cylinder *g*, the magnetic ore contained therein will jump up and adhere to the surface of the cylinder *g*, which, revolving in the direction of the arrow, Fig. 1, will carry the magnetic ore adhering to it into the chute *l*, where it will fall down and be deposited in a suitable receptacle.

m is a revolving brush which may be employed to insure the cleaning of all magnetic ore from the surface of cylinder *g*. The tailings will remain upon the conveyer-belt and pass over the drum *o* into the chute *n* and be deposited in a separate receptacle from that provided for the magnetic ore. The conveyer-belt *e* is stretched upon the drums *o* and *o'*, and is held taut by means of a sliding bearing for the drum *o'*, controlled by the screw *p* and hand-wheel *p'*. The pulley *q* serves to drive the conveyer-belt.

The position of the cylinder *g*, together with its contained electro-magnets, with reference to the conveyer-belt *e* may be adjusted vertically by means of the set-screws *r r' r² r³*. The electricity for the electro-magnets may be supplied through the wires *s s'*, entering the end of the cylinder, as shown in Fig. 2, through the hollow shaft *i*.

When an inclined table is substituted for the carrier-belt as a conveyer, the apparatus takes the form shown in Figs. 3, 4, and 5, in which *t* is an inclined table hinged at its upper end at *t'* and provided with mechanism, as at *t²*, whereby its angle of inclination may be adjusted. Upon this table are mounted one or more cylinders like that already described, containing each a series of electro-magnets, the said cylinders being lettered *g g' g²* in Fig. 3.

m m' m² are the brushes, and *l l' l²* are the chutes which receive the magnetic ore and discharge it at one side of the inclined table, as shown in Fig. 5. The object in having more than one of the cylinders *g* is so that each cylinder of the series may collect the magnetic ore, and by reason of the adjustability of each still a further important object is accomplished—namely, the first in the series may be adjusted at such a distance away from the conveyer as to collect only the most valuable portion of the ore. The second may be adjusted somewhat nearer, so as to collect a portion next in value, and so on, each succeeding cylinder being adjusted nearer to the conveyer than the preceding one, until the poorest quality of ore has been extracted which it is desired to separate. Each quality is of course discharged through a separate chute.

n' is a slide which may be employed for adjusting the size of the opening between the

cylinder *g* and the cover *f*, so as to regulate the opening, as required, to keep back such portion of the ore as it is not desired to collect at that particular point.

The upper surface of the inclined table *t* is preferably made of polished glass. The tailings will be deposited at the lower end of the inclined table.

I am aware of Letters Patent of the United States No. 383,863, granted to Gurdon Conkling, dated June 5, 1888, in which is described a machine containing a conveyer-belt and a supplemental belt and magnets arranged to collect the ore upon the surface of the supplemental belt, by which it is discharged at one side of the conveyer-belt. I make no claim to the machine of the construction shown in said patent. The pole-pieces *k k'*, being connected with each of said magnets and being made to extend across the cylinder *g*, will equalize the magnetic force across the width of said cylinder, so that the iron particles will all be equally attracted and the action of the device will be uniform, even if there should be some inequality in the force of the individual magnets.

I claim—

In combination with the conveyer, a revolving cylinder composed of a shell of non-magnetic material, stationary magnets within said cylinder, and pole-pieces adjacent to the surface of the conveyer and made to extend across the conveyer and to connect the various magnets, so as to equalize the magnetic force, substantially as described.

JOHN P. CONKLING.

Witnesses:
D. H. DRISCOLL,
FRED KEMPER.