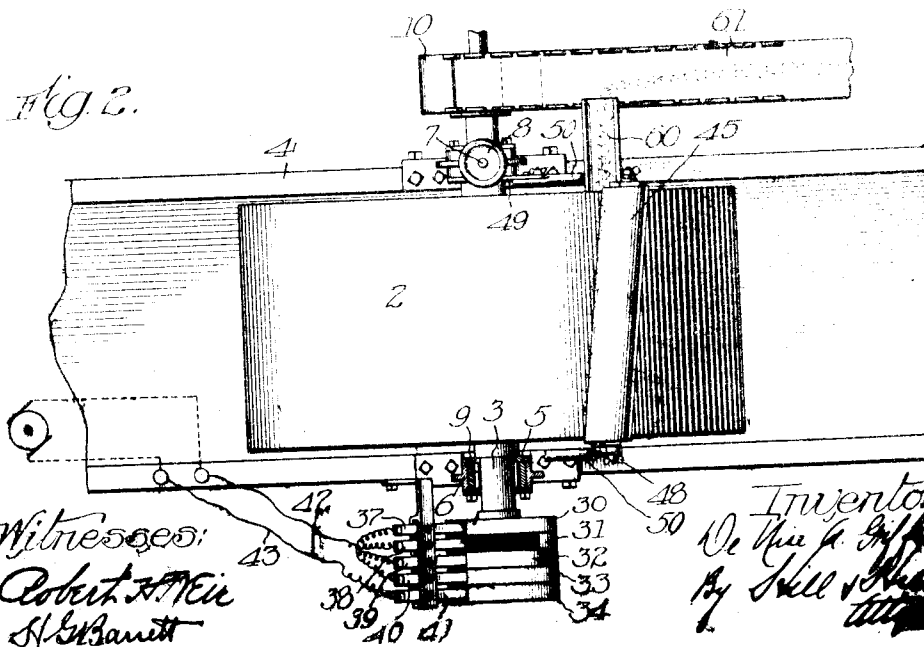
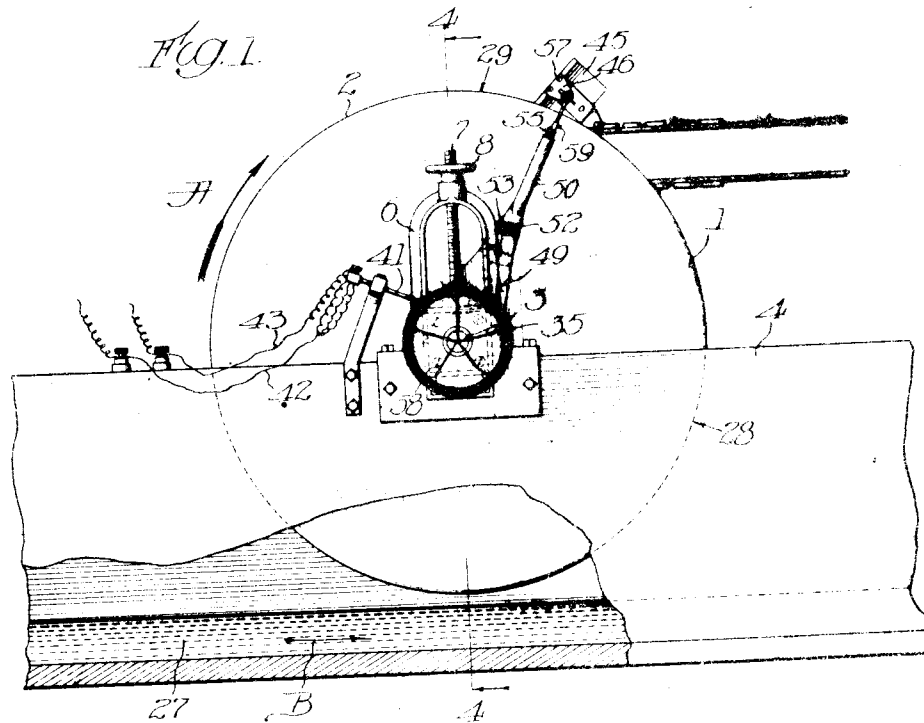


DE NISE A. GRIFFITHS.
MAGNETIC SEPARATOR.
APPLICATION FILED MAY 3, 1909.

Patented Dec. 31, 1912.

3 SHEETS-SHEET 1.

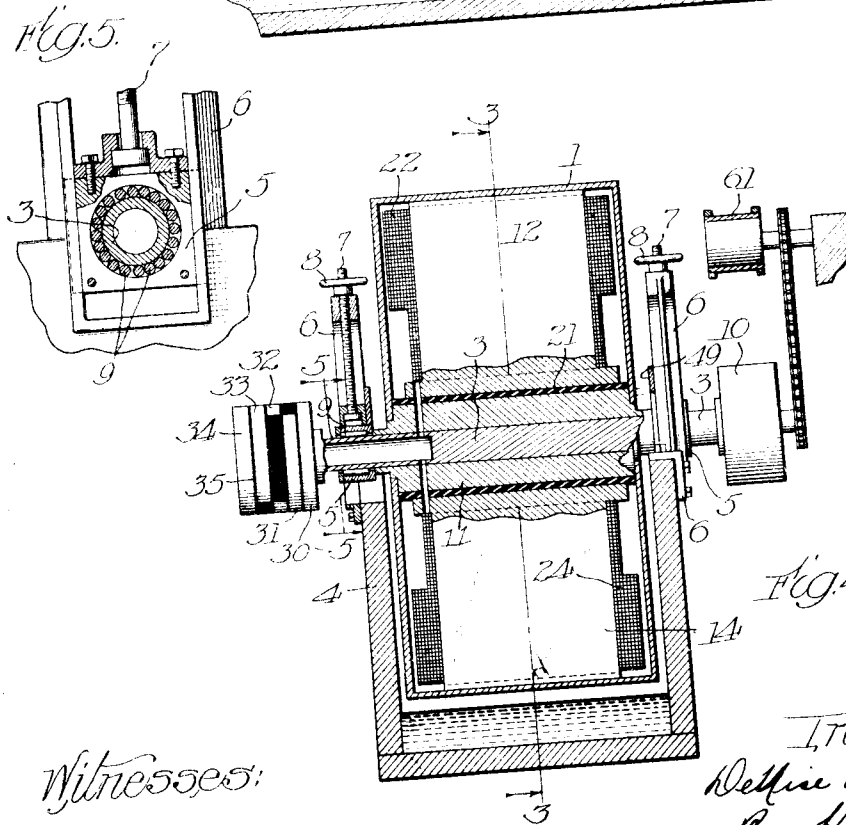
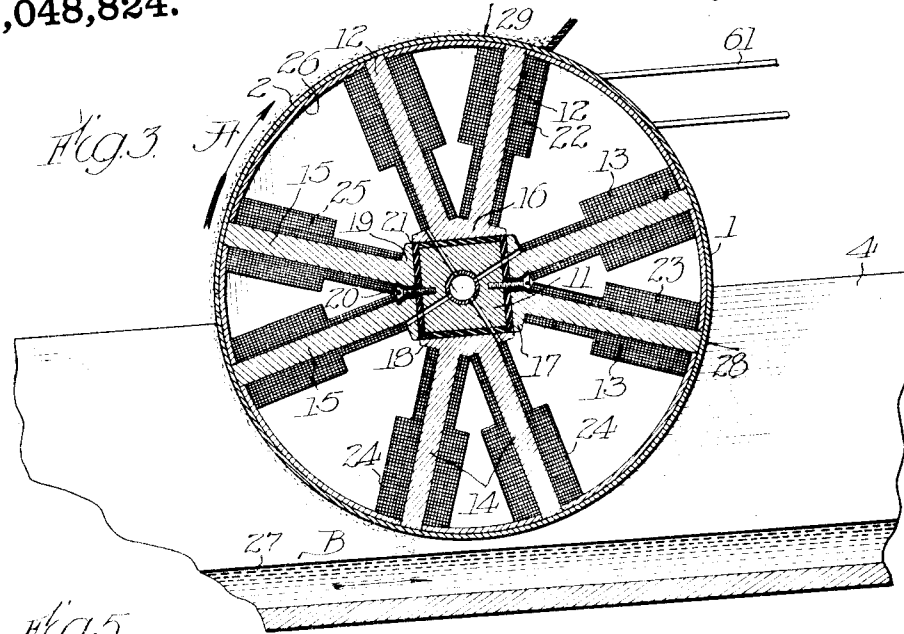
1,048,824.



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3 SHEETS—SHEET 2.

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3 SHEETS-SHEET 3.

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Fig. 6.

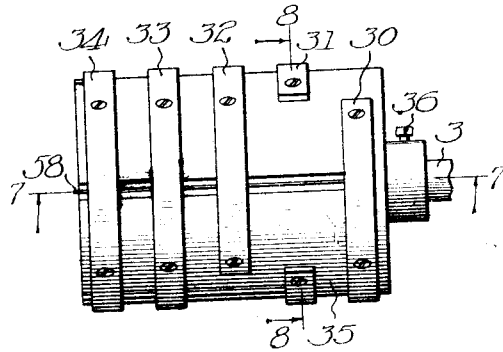


Fig. 7.

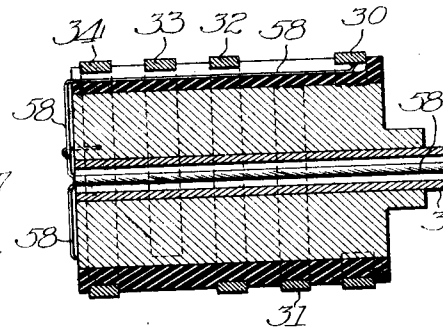


Fig. 8.

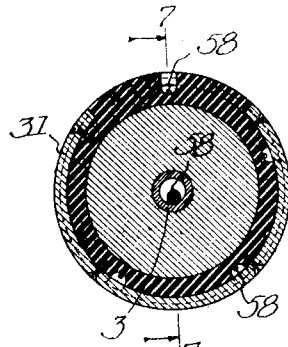


Fig. 10.

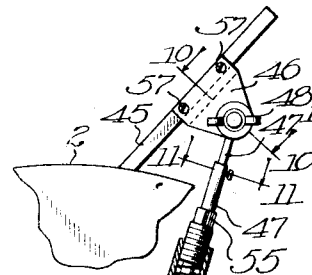
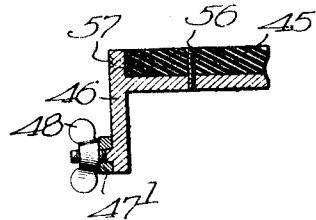
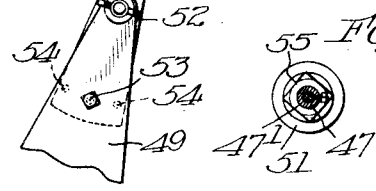


Fig. 9.

Fig. 11.



Witnesses.

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UNITED STATES PATENT OFFICE.

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MAGNETIC SEPARATOR.

1,048,824.

Specification of Letters Patent.

Patented Dec. 31, 1

Application filed May 3, 1909. Serial No. 493,530.

To all whom it may concern:

Be it known that I, DE NISE A. GRIFFITHS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Magnetic Separators, of which the following is a description.

My invention belongs to that class of devices, known as separators or the like, and relates particularly to an electro-magnetic separator.

The invention has for its objects the production of a more simple, efficient and satisfactory device of the kind described for use wherever found applicable.

To this end my invention consists in the novel construction, arrangement, and combination of parts herein shown and described and more particularly pointed out in the claims.

In the drawings wherein like reference characters indicate like or corresponding parts, Figure 1 is a side elevation of the preferred form of device, Fig. 2 is a top elevation of the same, Fig. 3 is a sectional view taken substantially on line 3-3 of Fig. 1, Fig. 4 is a sectional view taken substantially on line 4-4 of Fig. 1, Fig. 5 is a sectional view taken substantially on line 5-5 of Fig. 4, Fig. 6 is a side elevation of the preferred form of commutator, Fig. 7 is a longitudinal, sectional view of the same, Fig. 8 is a cross sectional view of the same, Fig. 9 is a detailed view of the wiper for removing the separated material from the gathering face, Fig. 10 is a sectional view of the same taken substantially on line 10-10 of Fig. 9, and Fig. 11 is a sectional view taken substantially on line 11-11 of Fig. 9.

Referring to the drawings in which the preferred form of my device is shown, 1 is a cylindrical drum of suitable material provided with what may be termed a gathering face 2 preferably of brass, zinc or other non-magnetic material. As shown the drum is arranged on a suitable shaft 3 and arranged to be supported within or over a suitable sluice box 4 through which flows water or the like carrying in suspension the material to be separated. The purpose of the device is to separate or extract the magnetic material in the box 4 from the non-magnetic material, as for example, to extract the iron from gold containing material, or the like. In the preferred construction the drum, containing one or more electro-magnets, is ad-

justably mounted within the sluice box so that it may be raised or lowered as desired or required. Any suitable arrangement may be employed for mounting or supporting the drum and magnets, a very simple arrangement being shown comprising a part or journal box 5 on each side of the drum arranged and maintained in position by means of guides 6. The journal boxes 5 are supported in the guides by means of suitable rods 7 and nuts or hand wheels 8, or the equivalents for the purpose. The drum may be raised or lowered by turning the hand wheels the required distance in one direction or the other. If desired roller bearings 9 as shown in Fig. 5 or their equivalent may be arranged in the journal boxes 5 to reduce the friction. The drum may be driven or rotated in any suitable way. As shown a driving pulley 10 is provided for the purpose, any suitable means being provided for driving the pulley.

Within drum 1 is arranged one or more magnets, there being preferably a plurality of electro-magnets provided with horse shoe cores arranged with the yokes at the shaft 3 and extending to the gathering face 2 with their pole faces proximate thereto. Referring particularly to Figs. 3 and 4 in which the same is most clearly shown, a block 11 is arranged on the shaft 3 and is adapted to carry the magnets.

In the drawings four horse shoe electro-magnets are shown each comprising the cores 12-16-12, 13-17-13, etc., the part 16 having the parts 12-12 secured thereto being secured to the part 11, etc., the various magnet cores being suitably insulated from the block 11. As shown the several cores mentioned are provided with coils 22, 23, 24 and 25 arranged thereon, the same with the cores forming a plurality of electro magnets with their pole faces proximate to the inner side of the gathering face 2 of the drum. A facing 26 of wood or the equivalent may be arranged on the inner side of the drum face 2 the same serving to reinforce the drum face as well as to assist in bracing the several cores.

In operation, assuming the water or like 27, carrying in suspension the material to be separated or extracted, to be flowing through the sluice box in the direction indicated by the arrow B, the drum is preferably rotated in the direction indicated by the letter A so that the magnetic material is gathered on the drum face 2. Any suitable

means may be provided to remove the material so gathered, the preferred construction comprising a wiper or scraper 45 arranged to wipe the drum face.

5 In the preferred construction I preferably excite the magnetic cores during a portion of the travel and break the circuit approximately at the time the magnet is passing the wiper. To accomplish this I provide means
10 for independently controlling the exciting of each magnet, so that, for example, each magnet will be excited between the points 28 and 29 or approximately those points and not be excited while passing between points 29
15 and 28. This facilitates the operation of the wiper 45. To accomplish this I provide what may be termed a commutator 35 on the shaft 3 the same being preferably secured thereto by means of a set screw 36 or its
20 equivalent so that it is adjustable on the shaft. On the commutator 35 is provided a suitable number of commutator bars 30, 31, 32, 33 and 34, there being one bar for each horse shoe magnet and one common to all.
25 The bar 34 is continuous while the bars 30, 31, 32 and 33 are broken, the broken part representing the time when the magnets are not excited. The several commutator bars are provided with brushes 37, 38, 39, 40 and
30 41 of any suitable design and material. As shown a portion of the shaft 3 is made hollow the conducting wires 58 from the commutator bars passing therethrough to the interior of the drum where they are suitably
35 connected to the several coils arranged on the cores. One broken commutator bar, as for example, 30 and the continuous commutator bar 34 are connected to the coils 22, bars 31 and 34 to the coils 23, etc., the arrangement of the coils being such that the
40 two pole faces of the cores 12—12, etc., will be positive and negative. The several brushes are connected to suitable conductors 42 and 43 so that the several circuits mentioned may be formed the current being
45 derived from any suitable source such as a dynamo or the equivalent. It is, of course, obvious that the extent of the space through which the magnets are inoperative, is controlled by the length of the broken part in
50 the commutator bars and that the position of the inoperative space may be changed by adjusting or shifting the commutator 35 about the shaft 3.

55 To remove the material taken up or gathered on the face 2 I provide the scraper or wiper 45 which is preferably arranged between the points where the magnets are inoperative as before mentioned. The scraper
60 or wiper may be of any suitable material, rubber being found very satisfactory for the purpose and any suitable means may be employed to maintain the scraper in the desired position, the preferred construction
65 comprising means whereby its position may

be adjusted or changed as desired or found necessary. As shown brackets 49 are arranged on the boxes 5, to which are secured parts 50, the same being adjustable thereon
70 and provided with ends formed into a tube adapted to receive the rods 47. The resilient members or springs 51 and nuts 55 tend to normally retain the wiper 45 in good contact with the drum. As shown the rods 47 are provided
75 with extended parts 47', the same being adjustable relative to each other and retained at the desired adjustment by means of nuts 59 or their equivalent. The parts
80 50 are secured to the parts or arms 49 by means of thumb-screws 52 or their equivalent and bolts 53, it being possible to change the position of the parts 50 by changing the bolts 53 to a different bolt hole in the parts
85 49. The thumb-screw 48 also permits an adjustment of the wiper support 46. It is obvious that by means of this construction the wiper is raised or lowered with the drum and may be set in a variety of positions and angles relative to the drum face.
90

Any suitable means may be employed for conveying away the product or material gathered by the wiper or scraper 45. As shown a trough 60 conducts the material
95 gathered to a conveyer belt 61 the same being arranged to retain the material thereon. Any other equivalent arrangement may be employed to take care of the material removed by the wiper 45 or its equivalent. It is of course, obvious that my device may be
100 used wherever found applicable and that there may be any number of drums positioned in the same sluice box. After the magnetic and non-magnetic materials are separated these several materials may be
105 further separated or broken up if necessary by any suitable or well known method depending upon the use to which my device is put. In the preferred construction the drum is made water tight so that moisture
110 will not reach the interior of the same and injure coils, but it should be noted that the use of the separator is not confined to the separation of moist or wet material and that the material may be conveyed to the
115 drum in any suitable way.

Having thus described my invention it is obvious that various immaterial modifications may be made in the form, arrangement, construction, combination of parts or
120 uses shown, described or mentioned, hence I do not wish to be understood as limiting myself to the exact or preferred form, construction, arrangement, combination of parts or uses shown, mentioned or described.
125 What I claim as new, and desire to secure by Letters Patent is:

1. In a device of the character described, a sluice box, two journal boxes secured to said sluice box, a magnetic drum adjustably
130

supported in said journal boxes longitudinally yieldable arms supported by said journal boxes and a scraper supported between the outer ends of said arms and
5 overlying the drum bearing on the periphery thereof.

2. In a device of the character described, a sluice box, journal boxes secured to said sluice box, a magnetic drum adjustably supported in said journal boxes, angularly adjustable and longitudinally yieldable arms supported by said journal boxes, and a scraper supported between the outer ends of said arms and overlying and bearing on
10 the periphery of the drum.

3. In a magnetic separator, a magnetic drum, means for rotatably supporting the drum, a pair of independently and angularly adjustable arms secured to fixed sup-

ports at the ends of the cylinder, and a 20 scraper yieldably mounted upon said arms and engaging the periphery of the drum.

4. In a magnetic separator, a yieldable magnetic drum, means for supporting said drum to permit vertical adjustment thereof, 25 angularly adjustable arms positioned at the ends of the drum, plungers yieldably mounted in the upper portions of said arms, and an angularly adjustable scraper carried by said plungers and adapted to engage 30 the periphery of the drum.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

DE NISE A. GRIFFITHS.

Witnesses:

ROY W. HILL,
CHARLES I. COBB.