

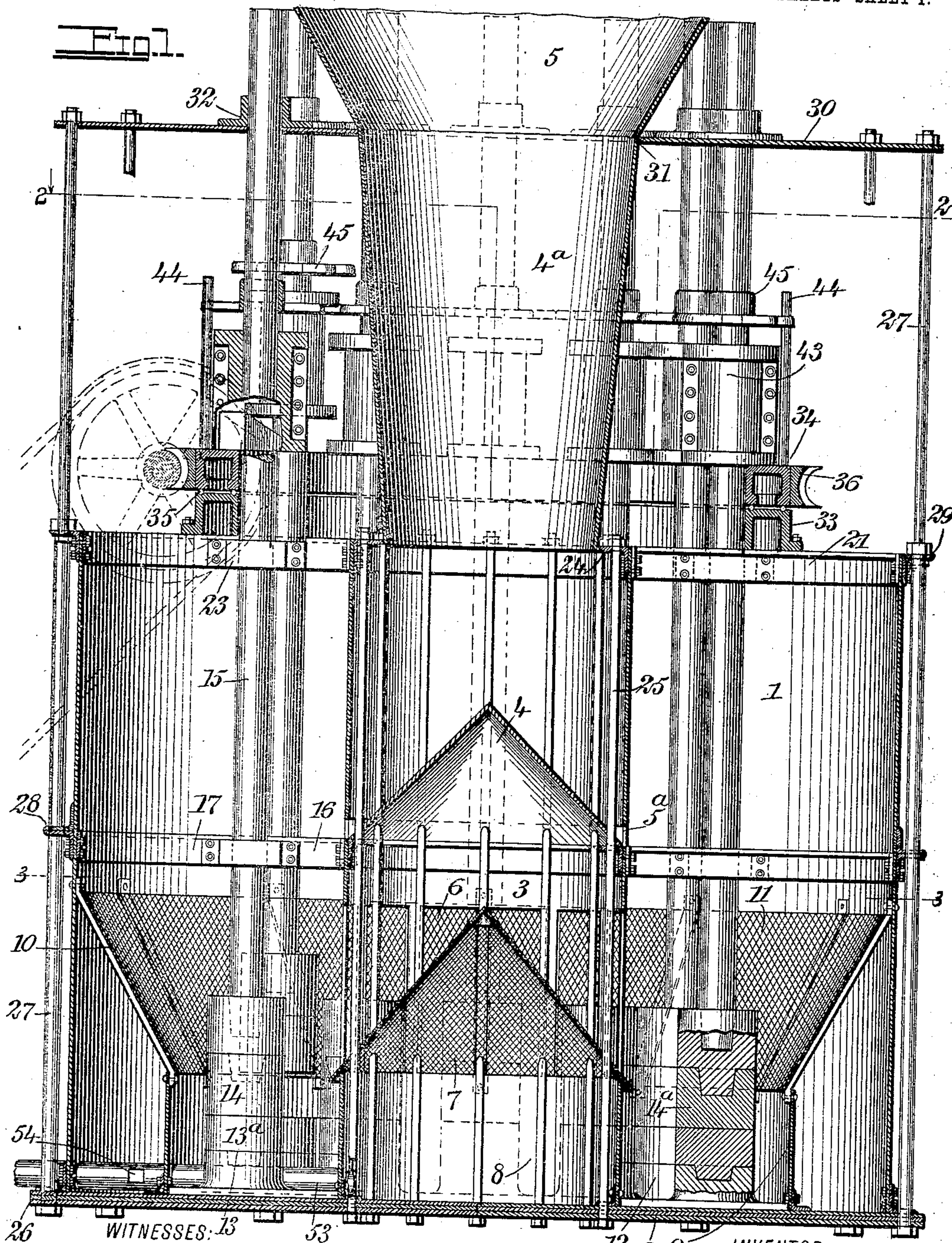
No. 855,284.

PATENTED MAY 28, 1907.

G. COON,
STAMP MILL.

APPLICATION FILED MAY 3, 1906.

2 SHEETS—SHEET 1.



L. Almqvist

F. D. Ammer

INVENTOR

George Coon

BY *Mum & Co*

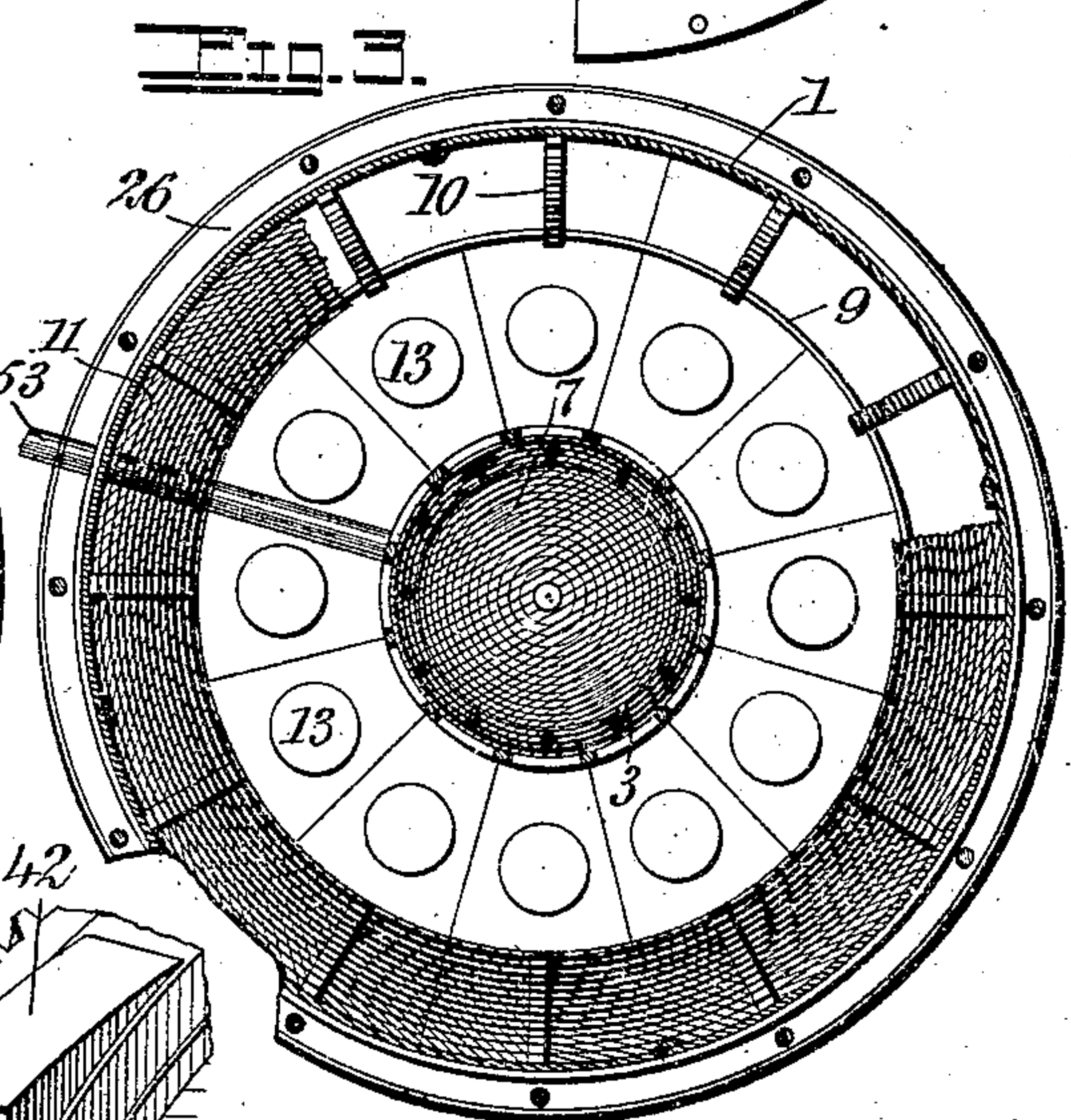
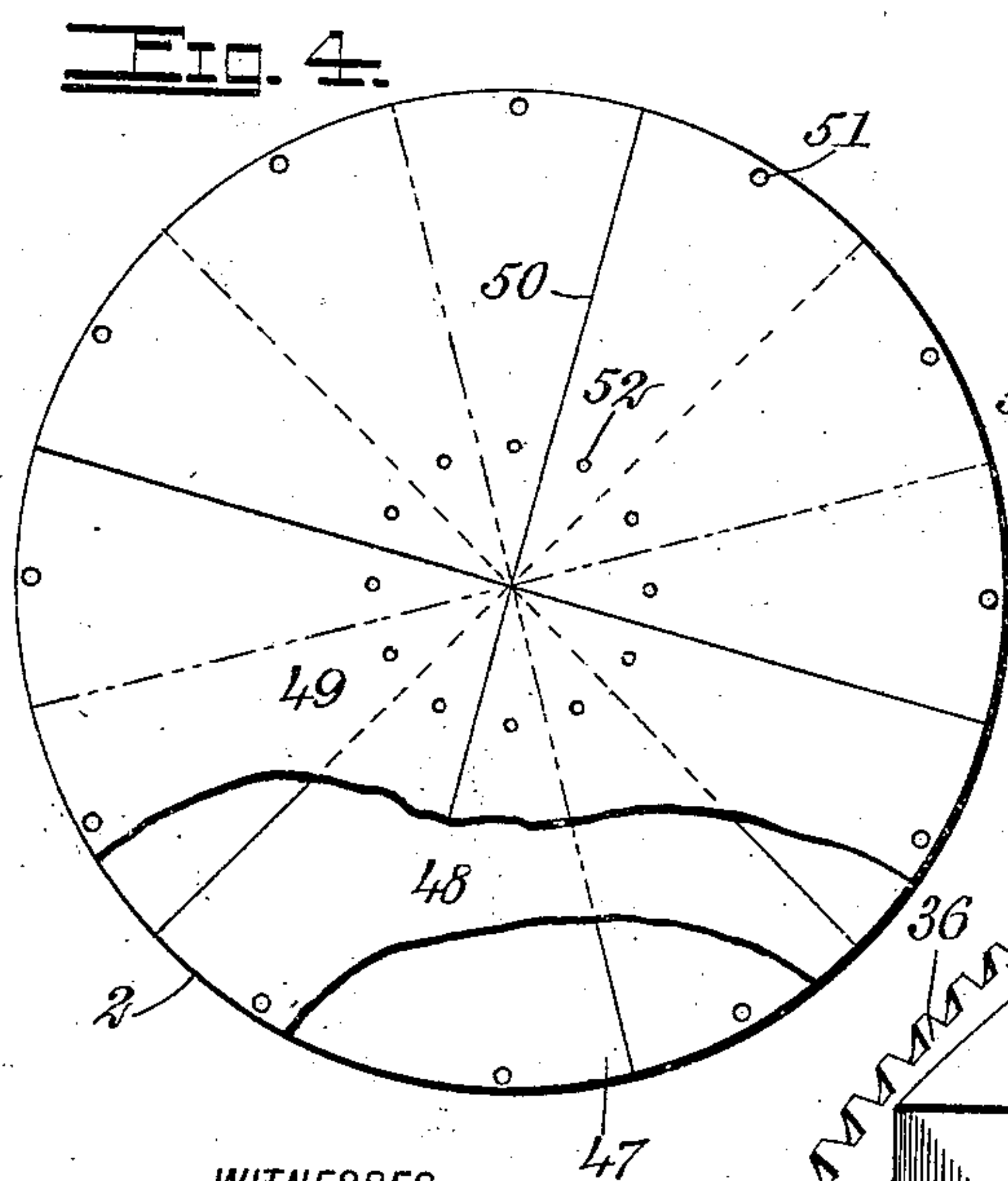
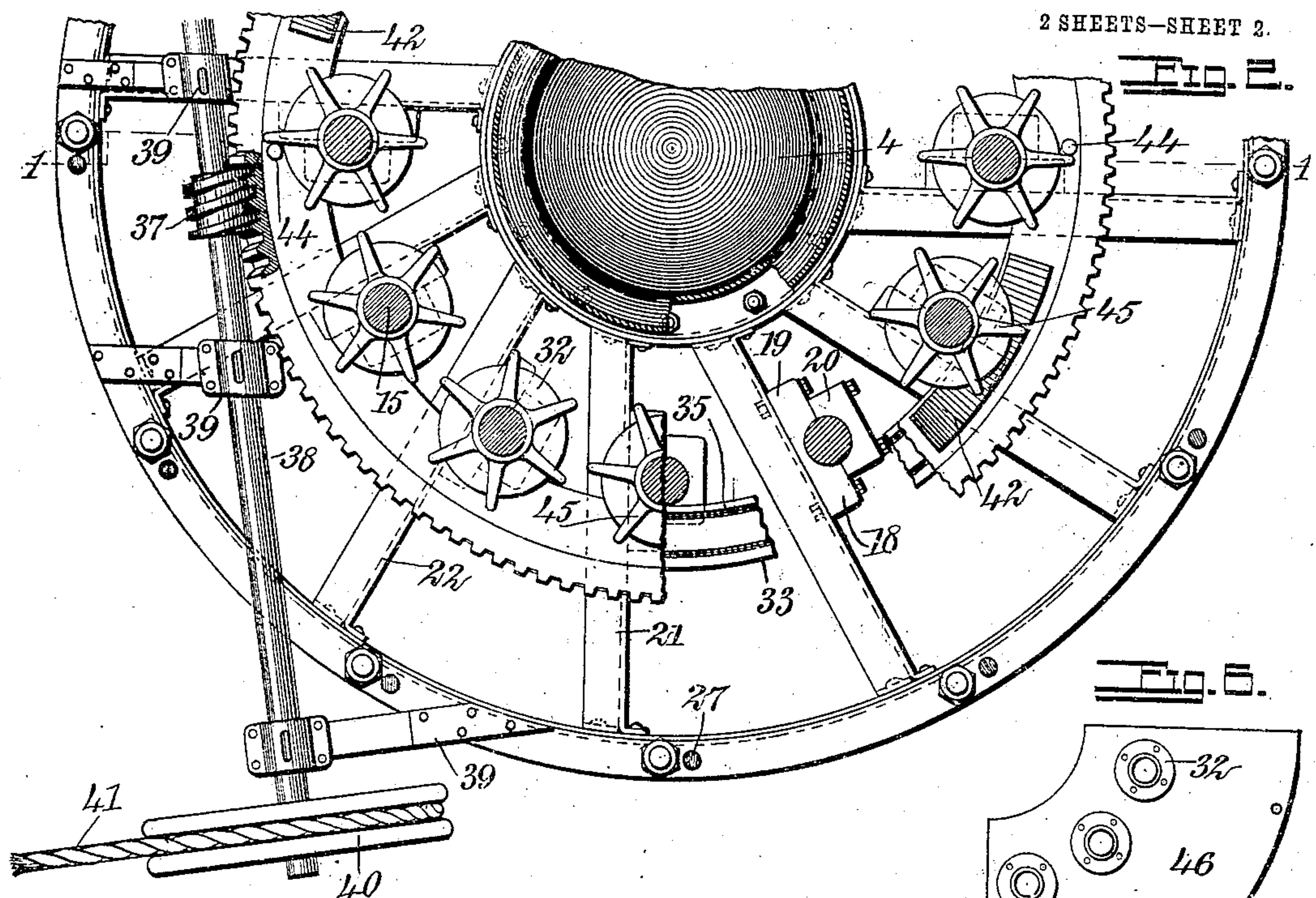
ATTORNEYS

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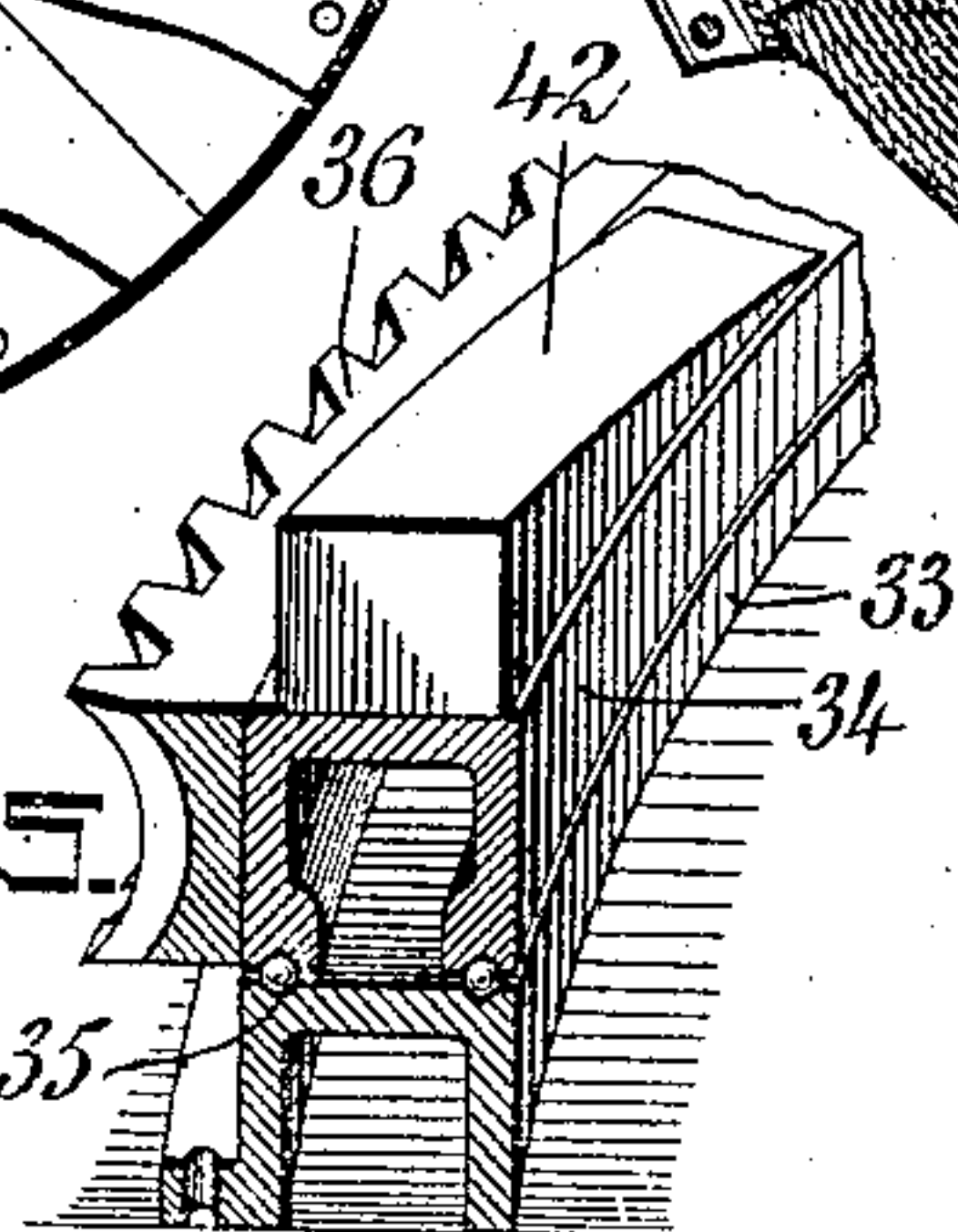
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2 SHEETS—SHEET 2.



WITNESSES:
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Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE COON, OF MOUNT VERNON, WASHINGTON.

STAMP-MILL.

No. 855,284.

Specification of Letters Patent.

Patented May 23, 1907.

Application filed May 3, 1906. Serial No. 314,961.

To all whom it may concern:

Be it known that I, GEORGE COON, a citizen of the United States, and a resident of Mount Vernon, in the county of Skagit and State of Washington, have invented a new and Improved Stamp-Mill, of which the following is a full, clear, and exact description.

This invention relates to stamp mills, such as used in the reduction of ores. It is intended to be used especially in the preparation of concentrates from gold ores, and its use contemplates the employment of the wet process.

The object of the invention is to produce a mill which will consume little power but which will be efficient in operation; a further object is to construct certain parts in sections, which may be readily transported through mountainous regions by pack-mules or similar means, and there assembled or erected for operation.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical central section through the stamp mill, the upper portion thereof being broken away; Fig. 2 is a horizontal section showing a portion of the mill, and taken substantially on the line 2—2 of Fig. 1, certain parts being broken away; Fig. 3 is a horizontal section upon a reduced scale taken on the line 3—3 of Fig. 1, certain parts being broken away; Fig. 4 is a plan also upon a reduced scale, of the bottom of the mill; Fig. 5 is a perspective showing a portion of a main driving wheel and illustrating the manner of mounting the same to rotate; and Fig. 6 is a plan showing a portion of the upper plate or cover of the mill.

Referring more particularly to the parts, 1 represents an outer tank of large diameter, which is provided with a bottom 2 of special construction, which construction will be described more fully hereinafter. Centrally disposed within this outer tank 1 there is a central tank 3, to the upper portion of which a chute 4^a attaches, said chute terminating above in an expanded mouth or hopper 5. At substantially the middle line of the inner tank 3, a cone or bell 4 is provided, disposed

within the interior thereof, as indicated, and near the lower edges of this cone, the side wall of the inner tank is provided with openings 5^a. The lower portion of the inner tank 3 which lies below this cone or bell is provided with longitudinally disposed openings 6, which are preferably rectangular in form as indicated. Within the lower portion of the inner tank 3, and at substantially the level of these openings 6, I provide a cone screen 7, which corresponds in form with the bell 5 described above. Placed as it is within the lower portion of this tank, the screen 7 completely cuts off the lower portion of the tank so that the interior of the inner tank below the screen constitutes a settling chamber 8 for concentrates. I provide also an annular wall or combing 9 disposed on the inner face of the bottom, and surrounding the inner tank 3 as indicated. From the upper edge of this combing, braces 10 extend diagonally to the wall of the outer tank 1, and to these braces attach an annular inclined screen 11. This screen 11 and the cone screen 7 referred to above are preferably of wire gauze of suitable mesh. The space between the annular combing 9 and the inner tank, constitutes a stamping chamber 12. In this space, I provide a plurality of anvils 13, preferably twelve in number as shown, and at an equal distance apart. Upon the upper faces of these anvils, a plurality of hammers or stamps 14 normally rest, said hammers being carried at the lower extremity of vertically disposed plungers or rods 15. It should be understood that when the mill is in operation, these hammers are raised and allowed to descend upon the broken ore in the stamping chamber. In order to guide these plungers vertically, I provide a spider 16, at substantially the middle point of the outer tank 1, said spider comprising a plurality of substantial radial arms 17; to the sides of these arms, guide blocks 18 are attached, the same being preferably formed in sections 19 and 20, which are bolted together as indicated most clearly in Fig. 2. The hammers 14 are made with shoes 14^a of steel attached as shown, and these may be renewed when worn out. The anvils 13 are similarly provided with facing blocks 13^a of steel. The bodies of the anvils and hammers are made of cast iron.

Another spider 21 is provided at the upper extremity of the outer tank, the same comprising substantially radially disposed arms

22, upon which the plungers 15 are guided in suitable blocks 23 similar to the blocks 18 described above.

The inner tank 3 comprises a cover 24 into which the aforesaid chute 4 attaches as shown. This cover is rigidly secured to the inner tank, and the entire inner tank is rigidly held in position by means of long through bolts 25, which pass up through the bottom 2 as indicated, said bolts being arranged circumferentially and passing through the cone 4 and the screen 7 near the outer edges thereof.

As indicated most clearly in Fig. 1, the edge of the bottom 2 projects beyond the side wall of the outer tank 1. In this way, a flange 26 is formed through which a plurality of bolts 27 pass upwardly. These bolts are held in position at the sides of the tank by means of flanges 28 and 29, the former flange being disposed at substantially the middle point of the tank, and the latter at the upper edge of the tank. These bolts 27 extend upwardly beyond the upper edge of the tank, and to their upper extremities a guide plate or cover 30 is attached. This guide plate 30 is provided with a centrally disposed opening 31, through which the aforesaid chute 4^a extends downwardly, the hopper 5 being disposed above the plate as shown in Fig. 1. The plungers 15 extend upwardly through guide openings formed in this guide plate 30, and at these openings, guide collars 32 are provided, the same being attached to the upper side of the guide plate as indicated.

Upon the arms 22 of the upper spider 21, rests a base ring 33, which supports a rotatable main ring or driving wheel 34. In order to reduce the friction at this part, balls 35 are provided running in suitable raceways formed in the adjacent faces of the rings. The main ring or driving wheel 34 comprises a rim 36, the said rim having teeth and constituting a worm wheel which meshes with a worm 37, as indicated most clearly in Fig. 2. This worm 37 is carried upon a horizontal shaft 38, the same being suitably mounted in bearings 39, and carrying a rigid pulley 40 over which a drive cable 41 passes, as shown. This ring or driving wheel 34 affords means for raising the hammers 14 in succession. For this purpose, the upper face of the wheel 34 is provided with a pair of oppositely disposed cams 42. These cams are simply wedge blocks rigidly attached to the upper face of the wheel as indicated most clearly in Fig. 5. At a suitable height the plungers 15 have rigidly attached thereto, tappets 43, the said tappets consisting of split sleeves fastened by bolts as shown. It should be understood that in operating the mill, the wheel 34 is rotated continuously and as it advances, the cams 42 pass under the lower edges of the screws 43 in such a way as to force the plungers upwardly one by one; as the rear edge of each cam passes from under

a tappet which it has just raised, the plunger carrying the tappet, is of course allowed to descend by its own weight until the hammer head 14 strikes the anvil therebelow.

I provide arrangements for giving the hammers a rotary movement after they have fallen in the manner described. For this purpose, I provide a pair of upwardly projecting pins 44, which extend vertically from the upper face of the wheel 34 as indicated. At a suitable point above the tappets 43, the plungers 15 are each provided with a star wheel or collar 45, and the arms of these star wheels lie in the path of the pins 44, as indicated in Fig. 2. From this arrangement when the pins engage the star wheels, they give them a part of a revolution. In this way, a grinding effect is produced under the hammers at the anvils which is highly advantageous in reducing the ore. Attention is called to the fact that these pins are located each to the rear of its corresponding cam, so that this partial rotation of the hammers takes place immediately after they have fallen.

The plate or cover 30 is preferably formed in four divisions or sections 46, one of which is illustrated in Fig. 6. Evidently four of these sections when united would form a complete circular plate having the central opening 31, as indicated in Fig. 1.

The construction of the bottom 2, will now be described: Referring especially to Figs. 1 and 4, this bottom is composed of three layers or plates 47, 48 and 49, and each of these plates is formed in four sections, having radial meeting edges 50. With this arrangement, the four sections may be united so as to form a circular plate. These plates 47, 48 and 49 are laid one upon the other, and attached rigidly by bolts which pass through bolt holes 51 and 52, as indicated. In attaching the plates together, they are arranged so that the meeting edges or butts 50 between the sections do not come into alinement, the relation being what is popularly known as a staggered relation. In this way a very strong and serviceable bottom is produced, the sections of which are small enough to enable them to be transported without difficulty, where the transportation facilities are not good. The openings 51 are near the outer edge of the bottom and through these openings the bolts 27 pass; through the openings 52 the bolts 25 pass.

When the mill is in operation, a quantity of water will be supplied to the tanks, and the concentrated ore, or particles of gold suspended in the water will find their way through the screen 7 and the screen 11, being deposited in the settling chamber 8, and in the settling chamber beyond the combing 9. In order to enable the concentrates to be carried off, I provide an outlet pipe 53, which rests horizontally upon the bottom leading

from the settling chamber 8. In the side of this pipe within the annular settling chamber beyond the combing 9, an opening 54 is provided, which drains this part of the tank. In this way, the concentrates are carried to the riffles.

The purpose of the cone or bell is to enable the incoming ore to be distributed among the anvils 13, and it should appear from the inspection of Fig. 1, that the lower edge of the cone is located at the lower edges of the openings 5^a, so that the ore readily runs through the openings at this point. By reason of the openings 6 referred to above, the space above the cone screen 7 is in communication with the stamping machinery so that some of the gold in suspension, may be deposited upon this screen and passed through into the settling chamber 8.

In practice, the outer tank 1, will be made in four pieces or sections bolted together in any suitable manner and these sections will be of small weight, enabling them to be transported readily; the inner tank is preferably formed in two pieces or sections.

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

1. In a stamp mill in combination, an outer tank, an inner tank disposed therein, a plurality of hammers disposed in said outer tank and surrounding said inner tank, a centrally

disposed chute, a cone disposed within said inner tank and adapted to deflect ore falling thereupon toward said hammers, said inner tank having openings near said cone through which the said ore may pass, a screen under said cone, a second screen in the lower portion of said outer tank, the space below said screens forming settling chambers, and means for actuating said hammers.

2. In a stamp mill, in combination, an outer annular tank and inner annular tank, a set of stamps in the inner tank, means for operating the stamps, a central tank with an upper set of openings and a lower set of openings through its walls, a feed cone in the upper part of the central tank delivering ore through the said upper set of openings to the said stamps, a screen covering the outer tank, a screen covering the lower portion of the central tank below the said lower set of openings for receiving reduced material from the said stamps, and means for withdrawing the concentrates from the spaces below said screens.

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

GEORGE COON.

Witnesses:

W. L. BRICKEY,
DAVE HAMMACK.