

No. 726,341.

PATENTED APR. 28, 1903.

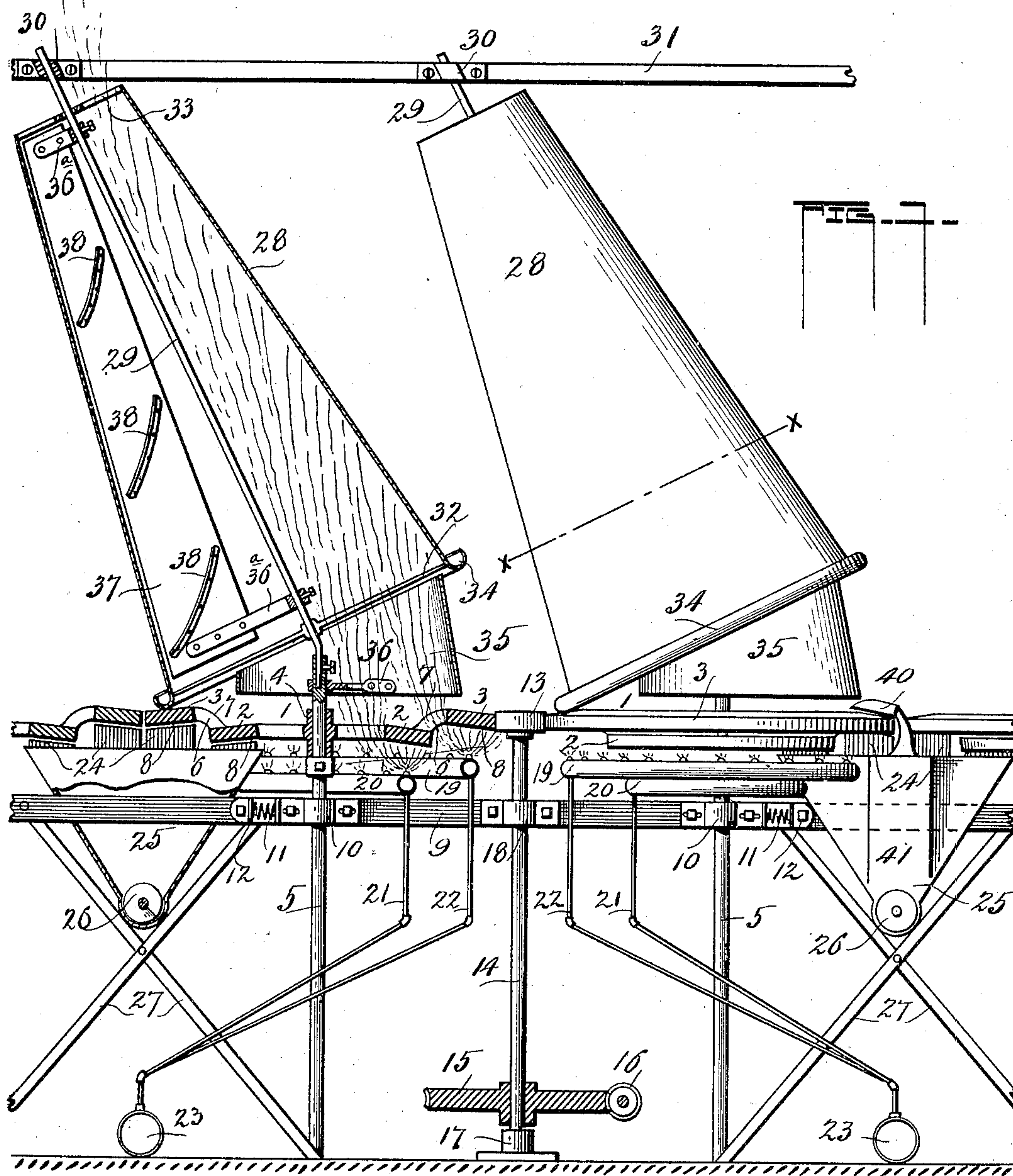
F. W. PORSCH.

APPARATUS FOR THE MANUFACTURE OF CARBON BLACK.

APPLICATION FILED DEC. 22, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
C. C. Johns.
H. B. Schmitz.

Inventor,
Frederick W. Porsch
By Chas. W. La Crosse
Att'y.

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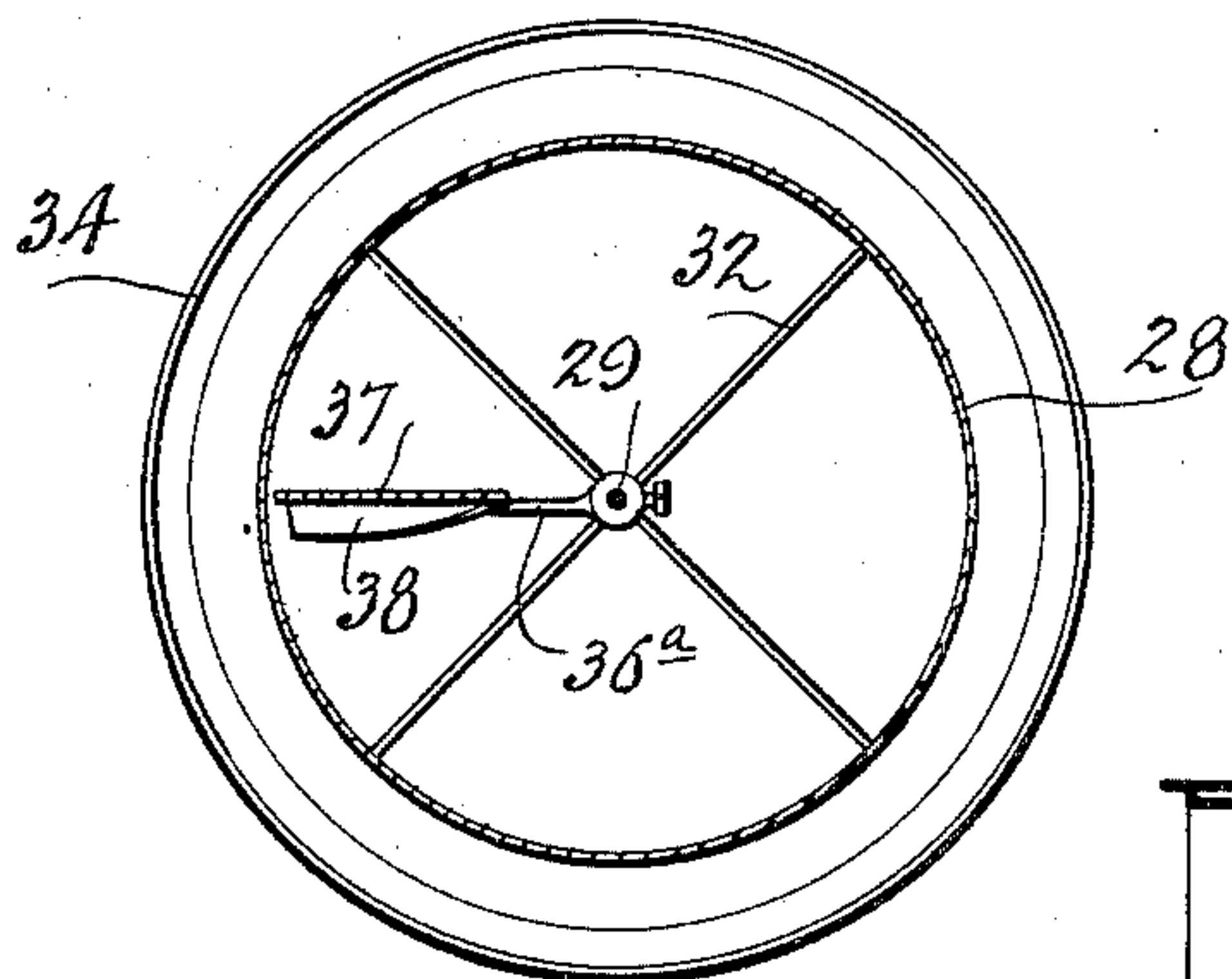
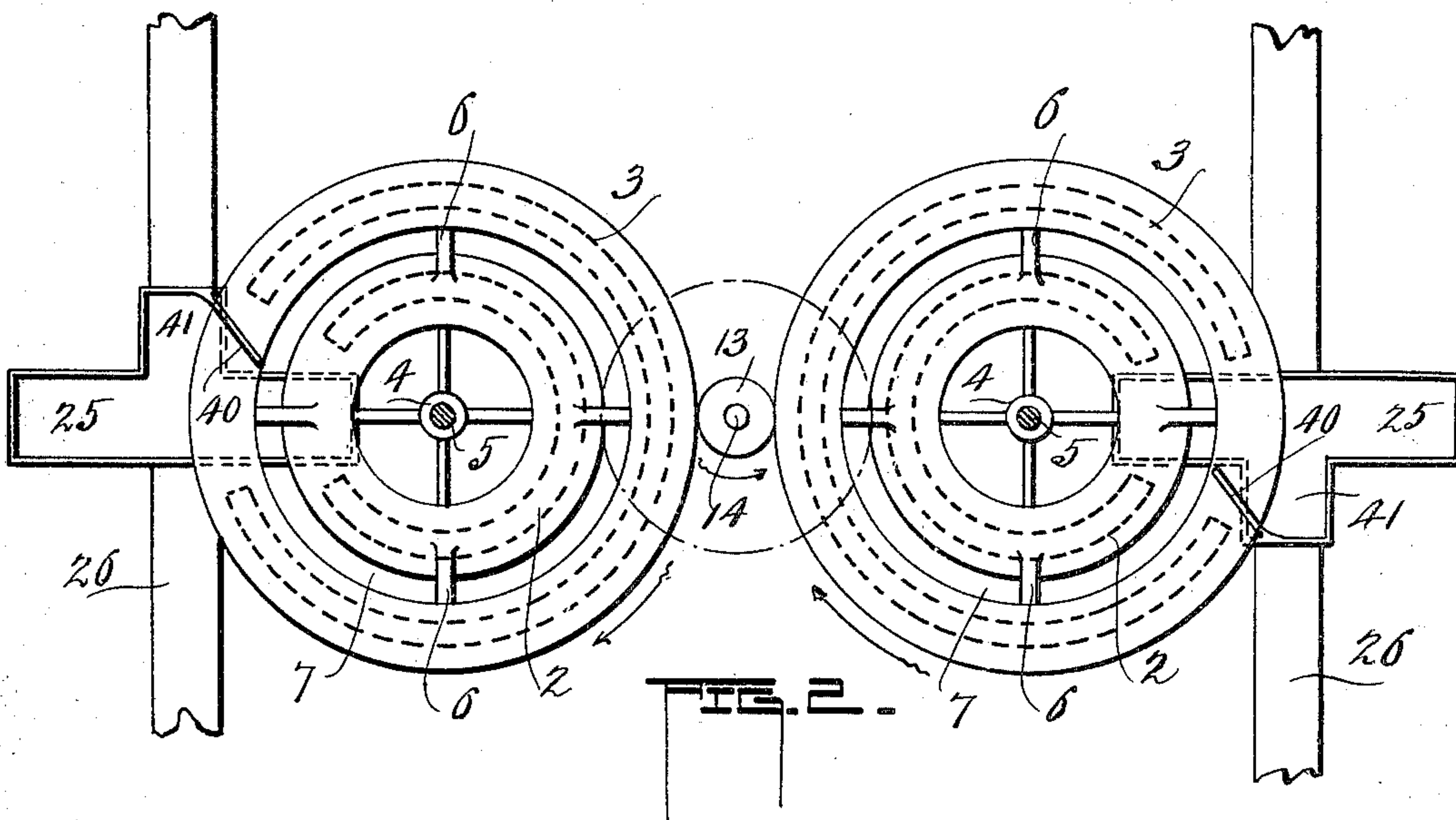
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UNITED STATES PATENT OFFICE.

FREDERICK W. PORSCH, OF SUMMITVILLE, INDIANA.

APPARATUS FOR THE MANUFACTURE OF CARBON-BLACK.

SPECIFICATION forming part of Letters Patent No. 726,341, dated April 28, 1903.

Application filed December 22, 1902. Serial No. 136,283. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. PORSCH, a citizen of the United States, residing at Summitville, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Apparatus for the Manufacture of Carbon-Black; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to improvements in machinery in the manufacture of carbon-black or "lampblack," as it is generally known; and it consists in the novel and peculiar combination of parts and details of construction, as hereinafter first fully set forth and described and then pointed out in the claims.

In the drawings already mentioned, which serve to illustrate my improved apparatus more fully, Figure 1 is an elevation of so much of an apparatus as will illustrate my invention, a portion of which is shown in vertical section. Fig. 2 is a plan view showing depositing-plates employed by me. Fig. 3 is a cross-section on the line X X of Fig. 1.

Like numerals of reference indicate corresponding parts throughout the figures.

The object of my invention is the production of a suitable mechanism for the economical manufacture of carbon from, preferably, natural gas. To attain this result, the devices which I employ are constructed within a suitable building, and the particular apparatus by means of which the carbon-black is produced comprises a series of depositing-plates 1, which preferably are annular rings 2 and 3. The rings 2 are formed integral by spokes or radial arms with a hub 4; revolvably mounted on a stationary support or shaft 5, and the rings 3 lie outside of rings 2 and are made a part of such rings through the web 6 and in such a manner as to provide an annular opening 7 of great width between the inner and outer edges of the plates 3 and 2, respectively. The rings 2 and 3, which form the plate 1, are so disposed with reference to each other that while the ring 3 lies beyond the outer circle described by the ring

2 it is elevated to some extent above the same, and the lower faces of each of the rings are beveled, as shown at 8. The shafts or supports 5 are suitably supported at their lower ends and at their upper ends have bearing on the frame-support 9 and in journaled boxes 10, which said boxes are held under yielding pressure by means of springs 11, bearing between a plate of the boxes and a support 12, for the purposes which will now be described. It is designed to rotate the plates 1 by means of a friction-drive, comprising a friction-pinion 13, supported on a suitable drive-shaft 14, which said shaft may receive its power in any suitable manner; but for convenience I have provided the worm-wheel 15 and the worm 16, the latter designed to impart movement to the worm-wheel 15 from a suitable source of power. This shaft may have a bearing for its lower end, as shown at 17, and an additional bearing at 18 upon the frame 9. The peripheral edges of the rings 3 are designed as frictional bearing-surfaces, which frictionally engage the pinion 13 and are driven thereby. This is one means of imparting power to the depositing-plates; but other desirable and convenient means may be employed; but when employing a friction-drive it is preferable to use a yielding pressure device for the shaft 5 or otherwise employ it for holding the plates 1 in frictional contact with their drive-pinion.

Suitably supported beneath the plates and lying a suitable distance beneath the rings forming such plates and approximately beneath the center of such rings are annular burners 19 and 20, and 21 and 22 are feed-pipes suitably connected with the burners aforementioned, that are fed from a source of supply, (indicated as 23.) The jets of such burners when the burners are disposed as has been described will direct the flame and cause it to spread over the surface formed by the rings 2 and 3, and the spread of flame will be such that the smoke therefrom passes up around the opposite edges of the rings and is directed through the annular opening 7, formed by the outer and inner edges of the rings 2 and 3. Attention is now directed to the purpose of the lower beveled faces 8 of the rings, which is such that the escape of

the surplus carbon from the flame will be directed toward the inner edges of the rings 2 and 3 and the carbon liberated by the burners 19 will pass up through the annular space 7 and that produced by the burners 20 will pass up between the spokes or radial arms which support the rings 2. I have provided for removing the carbon from the lower faces of the rings 2 and 3, which is scraped therefrom by scrapers 24 and caught by a hopper 25 and carried to a suitable receiving-receptacle (not shown) by means of a suitable conveyer 26. The hopper is supported by the frame 9, which passes through the same, and the frame 9 is supported upon the uprights 27. I have provided a series of conical depositing-flues, (indicated as 28,) having their upper and lower ends open. These flues are supported for rotation on a support 29, having its lower end fixedly secured in the upper extreme ends of the shafts 5, and the outer ends of the supports 29 have a bearing at 30 in a suitable frame-support 31. 32 and 33 indicate spiders carried by supports 29 and engaged in a suitable manner by the walls of the conical flues 28, by means of which the said flues are rotatably mounted on supports 29. The upper spiders 33 may be arranged with contracted or enlarged openings whereby the draft through the flues may be regulated. The disposition of the conical flues 28 is at an angle bearing obliquely to the central vertical line or axis of the shafts 5, which cause the lower edges of the flues 28 to bear obliquely or diagonally from the upper surfaces of the rings 3. The lower edges of the flues 28 have the outwardly-presented rolled portions 34, substantially as shown in the figures, and the tilt of the flues is such as to cause a portion of the lower rolled faces 34 at all times to frictionally engage the upper surface of the rings 3, by means of which through the rotation of the plates 1 the flues 28 are slowly revolved. The upper faces of the rings 2 and 3 are arranged parallel with their lower faces, as shown in the drawings; but they may, if desired, instead of presenting an upper bevel face lie horizontally, and in this I do not wish to confine myself. It will be observed that in providing a collecting-flue of cone shape bearing obliquely to the axis of its main support 5 all carbon escaping and allowed to pass from beneath the lower faces of the rings will pass up into the flues and will be deposited on the surface of the flues against which the carbon is directed. To insure that the carbon escaping from the rings shall be directed to the flues, I have provided a stationary shield 35, overhanging the rings forming the plate, which will receive and direct the carbon from the plates to the flues somewhat in the manner shown in the sectional portion of Fig. 1. This shield is supported in a suitable manner from the support or shaft 5 by means of the radial arms 36. For depositing the carbon in the man-

ner described on the inner surface or wall of the flues 28 I also provide for scraping the same therefrom and collecting it at a suitable point on the upper surface of the rings 3. The scraper by means of which this is accomplished is indicated as 37, supported in a stationary manner from the support 29 by means of the braces 36^a, as shown, and upon the scraper 37 I have provided a series of cleats 38, disposed at suitable points thereon, which form sloping pockets toward the wall of the flues 28, which receives to some extent the bulk of the carbon scraped from the wall of the flues and retards the downward movement thereof and permits the carbon to be gradually deposited onto the upper surface of the plate 3, which will also prevent the carbon from being blown and deposited at every other place besides the point where it is intended to be received on the plate 3. By employing the upper surfaces of the plates or that portion thereof indicated by the rings 3 it is necessary to also provide for the removal of the carbon therefrom and deposit the same in the hoppers 25. For this purpose I have provided suitable scraping means 40, which overhang the upper surface of such plates and are disposed in such a manner that as the plates rotate the carbon deposited thereon from the flues will be brushed off and permitted to fall into the hoppers 25, and to insure the carbon brushed off of the upper surface of the plates being deposited in the hoppers 25 I have provided the lateral extensions 41 therefor.

In the apparatus which I describe and show herein I have provided for collecting the finest particles of the carbon, which it has not heretofore been able to attain. By constructing the plates so that they have an upwardly-placed cone or beveled surface the carbon which is not deposited on the surface of such plates will be directed to the interior of the flues 28 and deposited thereon. I am aware of various forms of plates and collecting-surfaces which have been provided; but I am not aware of any plates of the formation which I show nor the provision of a rotating depositing-flue for collecting the escaped carbon for which I provide and a scraping means within such flue for freeing the carbon therefrom and depositing it onto the upper surfaces of the plates and in scraping it therefrom, and I do not wish to be confined to the details of construction and arrangement herein, as various changes may be made without avoiding the principle herein.

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

1. In an apparatus of the class described, the combination of a depositing-plate, and scraping means for the upper surface of such plate, substantially for the purpose set forth.

2. In an apparatus of the class described, the combination of a depositing-plate, and

scraping means for the upper and lower surfaces of such plate, substantially for the purpose set forth.

3. In an apparatus of the class described, the combination of a depositing-plate having a bevel or cone surface, and scraping means for the upper surface of such plate substantially for the purpose set forth.

4. In an apparatus of the class described, the combination of a depositing-plate having beveled or cone-shaped upper and lower faces, and scraping means for the upper and lower surfaces of such plate, and conforming thereto, substantially for the purpose set forth.

5. In an apparatus of the class described, the combination of a depositing-plate, comprising two rings, each having beveled faces and the outerlying ring elevated above the inner ring, substantially as described.

6. In an apparatus of the class described, the combination of a depositing-plate, comprising two rings having beveled or cone upper and lower faces, the outer ring supported in a raised position from the inner ring and a channel formed by the arrangement of such rings, substantially for the purpose set forth.

7. In an apparatus of the class described, the combination of a depositing-plate comprising two rings, the outer ring supported away from and in a raised position by the inner ring and forming a space between the rings, burners located beneath the rings, and bevel lower faces of such rings for the escape of carbon between the inner face of the rings, substantially for the purpose set forth.

8. In an apparatus of the class described, the combination of a series of depositing-plates, a friction-drive for such plates, means for retaining a yielding pressure between the plates and drive, and burners beneath the plates substantially as described.

9. In an apparatus of the class described, the combination of a depositing-plate, means for driving the plate and a conical depositing-flue mounted above the plate and rotated thereby, substantially as described.

10. In an apparatus of the class described, the combination of a depositing-plate comprising a series of rings, means for driving the plate, a conical depositing-flue supported above the plate and rotated by frictional contact with the outer ring of such plate, substantially as described.

11. In an apparatus of the class described, the combination of a depositing-plate, means for rotating such plate, a conical depositing-flue rotatably mounted above the plates and scraping means for such flue, substantially as described.

12. In an apparatus of the class described, the combination of a depositing-plate, means for rotating such plate, a conical depositing-flue mounted for rotation above the plate, a scraper for the inner wall of such flue and pockets on the scraper, substantially as described.

13. In an apparatus of the class described, the combination of a depositing-plate, burners beneath the plate, means for rotating the plate, a conical depositing-flue mounted above the plate, means for rotating the flue and a scraper for the inner wall thereof, substantially as described.

14. In an apparatus of the class described, the combination of a depositing-plate, a burner for such plate and scraping means beneath the same, means for rotating the plate, a conical depositing-flue rotatably mounted above the plate, scraping means for the inner wall of the flue, and scraping means for the upper surface of the plate, substantially as described.

15. In an apparatus of the class described, the combination of a depositing-plate mounted for rotation, a conical depositing-flue above the plate having its axis bearing in a diagonal line to the axis of the depositing-plate, substantially as described.

16. In an apparatus of the class described, the combination of a depositing-plate, a burner beneath the plate and scraping means for the lower surface thereof, a conical depositing-flue mounted for rotation above the plate having its axis bearing obliquely to the axis of the plate, scraping means within the flue, and scraping means for the upper surface of the plate, substantially as described.

17. In an apparatus of the class described, the combination of a depositing-plate, means for rotating the plate, a burner beneath the plate, a conical depositing-flue mounted for rotation above the plate and a shield between the plate and flue, substantially as described.

18. In an apparatus of the class described, the combination of a depositing-plate, means for rotating such plate, a burner and scraping means beneath the plate, a conical depositing-flue supported for rotation above the plate having its axis bearing obliquely to the axis of the plate, stationarily-supported scraping means within the flue, a shield supported above the plate and beneath the flue and scraping means for the upper surface of the plate, substantially as described.

19. In a device of the class described, the combination with a depositing-plate mounted for rotation on a stationary support, a supplemental support supported by the depositing-plate support, a conical depositing-flue mounted for rotation on the second support and rotated by frictional contact with the upper surface of the plate, substantially as described.

20. In an apparatus of the class described, the combination of a rotating depositing-plate, burners beneath such plate, a conical depositing-flue above the plate having a rolled presented lower edge for frictional contact with the upper surface of the plate, substantially as described.

21. In an apparatus of the class described, the combination of a depositing-plate and a

burner and scraper beneath the same, a hop-
per supported beneath the plate, a conical
depositing-flue disposed in a tilting position
above the plate and scraping means within
5 the flue for loosening deposits therein which
are directed into the hopper beneath the plate,
substantially as described.

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

FREDERICK W. PORSCH.

Witnesses:

ROBERT N. McCORMICK,
CHAS. W. LA PORTE.