(No Model.) 3 Sheets—Sheet 1.

C. & E. H. MORGAN.

COFFEE MILL.

No. 425,815. Patented Apr. 15, 1890.

Fig. 1.

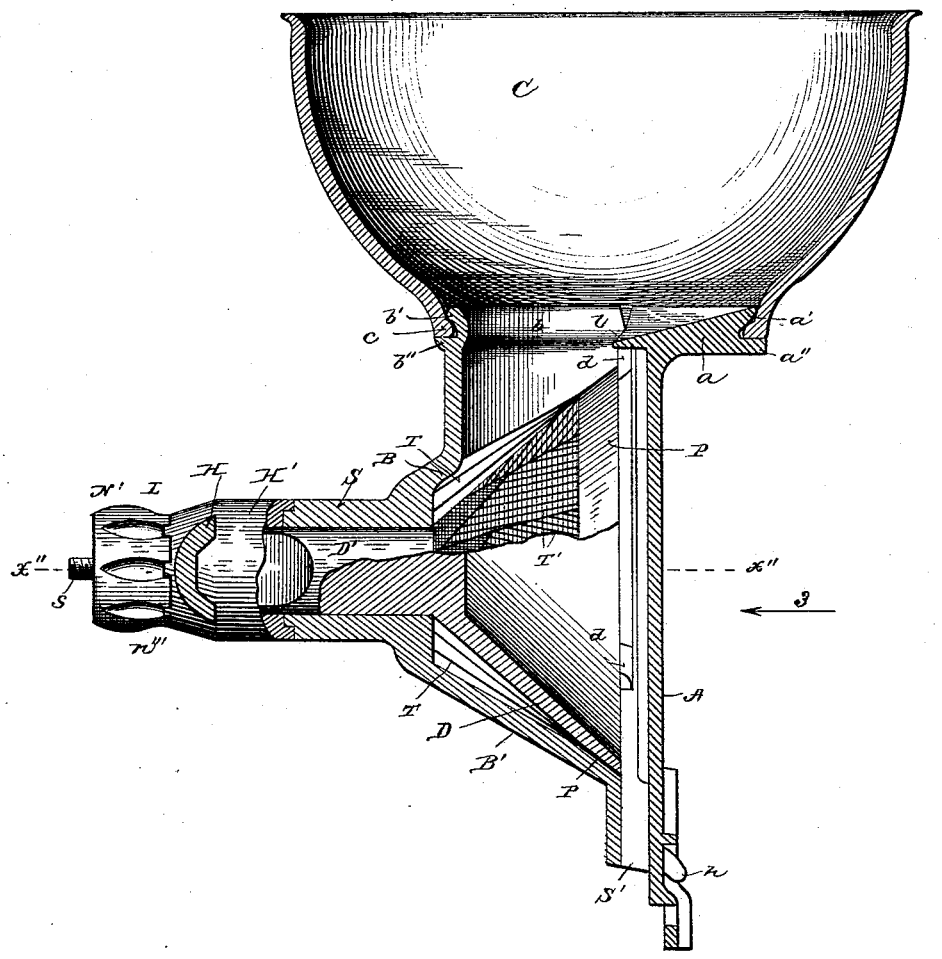

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Fig. 2.

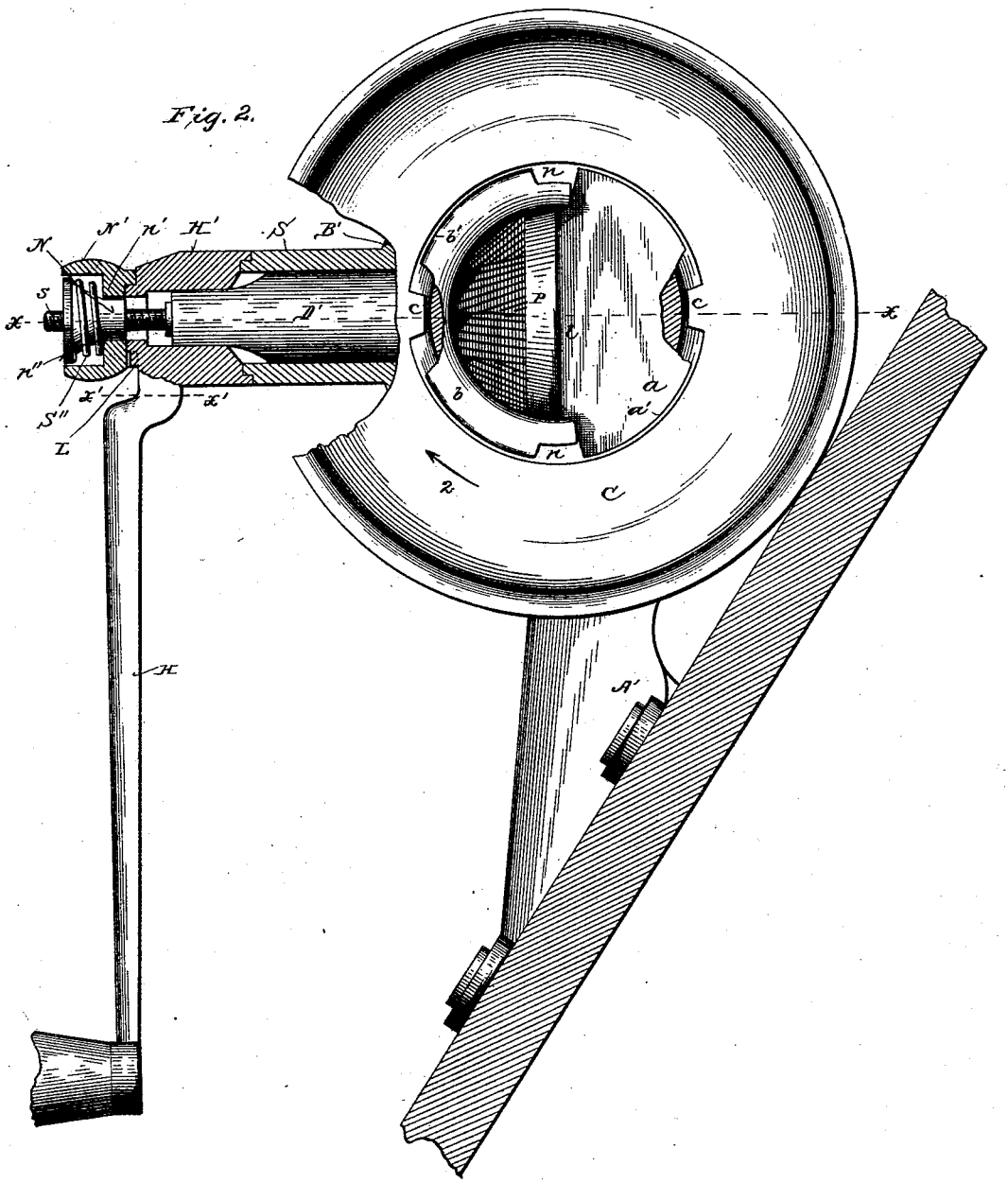

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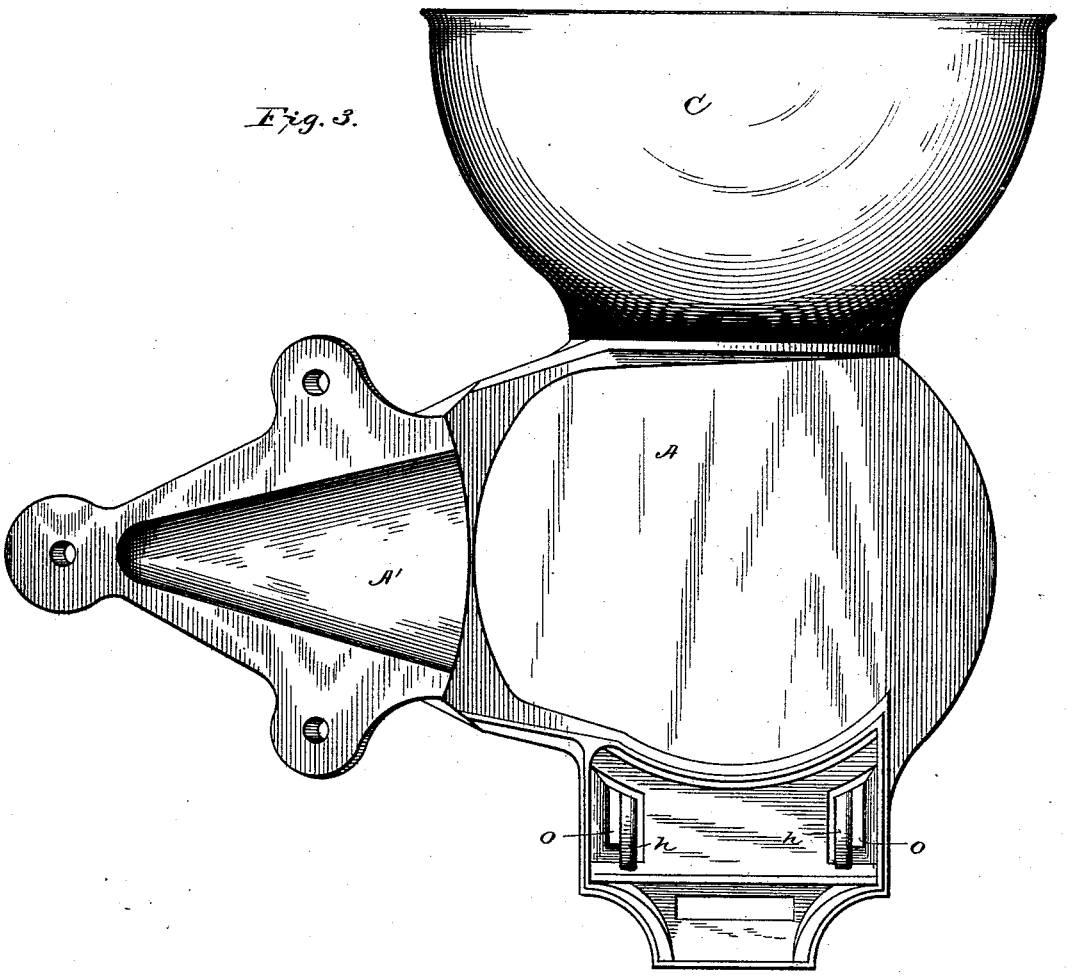
Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES MORGAN AND EDGAR H. MORGAN, OF FREEPORT, ILLINOIS.

COFFEE-MILL.

SPECIFICATION forming part of Letters Patent No. 425,815, dated April 15, 1890.

Application filed January 25, 1890. Serial No. 338,113. (No model.)

To all whom it may concern:

Be it known that we, CHARLES MORGAN and EDGAR H. MORGAN, residents of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Coffee-Mills; and we 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 pertains to make and use the same.

Our invention relates to improvements in grinding-mills of the particular class known as "side mills" or mills adapted to be secured in position upon a vertical wall.

The invention is fully described in this specification and shown in the accompanying drawings, in which—

Figure 1 is a view of our improved mill, partly in vertical section and partly in side elevation, the plane of section of the body of the mill being through the line X X in Fig. 2 and the plane of section of the crank or handle H being through the line X′ X′, Fig. 2. Fig. 2 is a view partly in top plan and partly in horizontal section, the plane of section being through the line X″ X″, Fig. 1. Fig. 3 is an elevation of the back plate of the mill and hopper of the mill, the view being in the direction indicated by the arrow 3, Fig. 1.

In the views, A is a back plate, having the outline shown in Fig. 3, the plate being provided with a lateral extension A′ for fastening it to a suitable support, and with a semi-cylindrical neck *a* formed on its upper margin. The front plate B is connected with the back plate A by hooks *h*, formed on the lower margin of the front plate and passing through openings *o* in the back plate, and is provided at its upper margin with a semi-cylindrical neck *b*, which, together with the neck *a* of the back plate, forms an approximately complete rim. The neck *a* has at its upper outer edge an annular flange *a′*, beneath which is a second flange *a″*, the two flanges being separated by a V-shaped groove, and the neck *b* of the front plate is provided with flanges *b′ b″*, corresponding in position to the flanges *a′ a″* of the back plate, and, like them, separated by a V-shaped groove. The grooves in the two parts *a b* form, practically, a single continuous groove, and the two flanges *a′ b′* above the groove form a ledge which is continuous, except for two oppositely-placed notches *n*, formed in its edges. Upon the frame formed by the front plate and the back plate rests a hopper C, whose lower circular end encircles the ring formed by the necks *a b* and holds the two parts together. Upon the lower margin of the hopper are formed two internal lugs *c*, of such form and position that they may be simultaneously passed downward through the notches *n* in the flange *b′* until they rest upon the flange *b″*. The hopper may then be rotated in the direction indicated by the arrow 2 in Fig. 2 until the lugs reach the position shown in said figure, when they are both held securely in the continuous groove between the flanges formed upon the necks *a b* of the front plate and back plate. The two semi-cylindrical necks are so placed as to be slightly eccentric with reference to each other, and the rotation of the hopper after its lugs are passed through the notches *n* draws the two parts of the neck together with a force which increases as the rotation progresses. At the same time the shape of the annular groove in which the lugs are seated is such that as the rotation of the hopper proceeds the lugs are drawn downward until they are pressed firmly against the flange *a″ b″*, forming the lower boundary of the groove. It will thus be seen that the rotation of the hopper, in the manner described, not only draws the upper ends of the front and back plates firmly together, but also draws the hopper downward upon the said plates, and thereby fastens the three parts firmly together, forming a single simple, strong, and compact frame.

The central portion of the front plate B is made up of a conical grinding-shell B′, formed with internal grinding ridges or teeth T, the neck *b* forming a passage-way from the hopper C to the grinding-shell when the parts are connected together, as shown in the figures. From the center of the grinding-shell projects a horizontal sleeve or bearing S, adapted to receive the shaft of a suitable grinding-burr. Upon the lower margin of the shell is formed a discharge-spout S′, for permitting the escape of the ground product of the mill. The neck *b*, the shell B′, the sleeve or bearing S, the discharge-spout S′, and the

hook *h* are integral parts of the same casting and form a part of the compactly-united frame made by connecting the two plates and the hopper in the manner above set forth.

Within the grinding-shell B′, and concentric therewith, is a freely-rotating cone D, having on its outer surface suitable grinding teeth or ridges T′, and on the apex of the cone is formed a horizontal shaft or spindle D′, journaled within and projecting beyond the sleeve S, formed on the grinding-shell. The outer end of the spindle D′ is non-cylindrical in form, and a crank or handle H is connected therewith by means of a hub H′, formed on the handle and conforming to the shape of the spindle. A screw *s* projects from the end of the spindle, and a nut N engages the screw and draws the spindle and grinding-cone outward, thereby regulating the space between the grinding-faces of the shell B′ and the cone. The nut N is inclosed by a guard N′, formed at its inner end with a transverse flange *n*′, in which is an opening conforming to the shape of the nut. Upon the outer end of the nut is formed a flange *n*″, and between the flanges *n*′ *n*″ is interposed a spring S″, which presses the guard inward against the outer end of the hub H′ and the handle. A series of notches *n*‴ are formed on the inner margin of the guard N′, each of said notches being adapted to engage a lug L, formed upon the outer end of the hub H′, and thereby locking the nut N and the hub H′ together. When it is desired to rotate the nut, the guard may be drawn outward sufficiently to release its notches from the lug L, and the nut may then be turned in either direction for the purpose of increasing or decreasing the distance between the grinding-shell and cone, and when the nut has been rotated sufficiently the guard may be released, when the spring S″ forces it inward and causes one of its notches to engage with the lug L, thereby relocking the nut to the hub H′ and handle H. The effect of this lock is evidently to prevent accidental rotation of the nut with reference to the handle, and the adjustment of the mill cannot therefore be disturbed by any accidental displacement of the nut arising from the jar caused by the operation of the mill.

In order to provide for the complete pulverizing of the grains of coffee or other material passing through the mill, we have formed the grinding cone and shell with the annular marginal pulverizing-section P illustrated in Figs. 1 and 2. This pulverizing-section is made up of two approximately smooth surfaces formed on the shell and cone, respectively, and so placed as to be in almost absolute contact when the mill is so regulated as to effect the particularly-fine grinding or pulverization which is often required. In order to form this surface, the grinding teeth or ridges T T′ are cast at the smaller ends of the shell and cone and diminish gradually toward their vanishing-point, which is near the outer or larger margin of each of the two grinding-surfaces. The smooth annular surface upon each of the grinding-surfaces is preferably at such an angle that any of its elements, if produced, will bisect the space between the cone and shell, though this particular position is not absolutely essential. The effect of the contact of the two smooth surfaces on the margins of the grinding parts is not only to provide for the complete pulverization of material, but also to permit the close running of the parts without any wear of the grinding-surfaces upon each other, so that in fact the mill may be very closely adjusted and run perfectly empty without any material interference of the grinding-surfaces.

In actual practice it is evident that when the two smooth surfaces are drawn close together, as they may be by means of the regulating-nut N, no material can pass over the space between the cone and shell and escape through the spout S′ until it is ground to a fine powder, and we have found that by means of this construction we are able to grind coffee to an almost impalpable powder.

The operation of the entire mill is perfectly evident from the foregoing description of the parts, but may be briefly recapitulated. Coffee or other material placed in the hopper C is admitted to the space between the cone and shell through the neck *b* of the front plate, the entrance of any of the material to the space between the cone and the back plate A being prevented by means of a lip I upon the inner margin of the neck *a* of the back plate. The rotation of the cone by means of the handle H grinds the coffee or other material and allows it to escape through the spout S′, the fineness to which the material is ground being regulated by the adjustment of the cone in the manner hereinbefore set forth.

The rear face of the extension A′ of the back plate is preferably oblique with reference to the plane of the back plate proper, in order that the grinding parts may be set out sufficiently to permit the use of a round hopper instead of a flat-sided hopper as usually employed hitherto in side mills. This is of course not an essential feature in the construction, though it adds to the convenience with which the mill can be attached to a suitable support.

It is evident that many of the details of construction of the device illustrated may be varied without departing from the principle or essence of our invention, and we desire therefore not to limit the invention to such precise forms or to the combination of any or all of them.

Having now described and explained our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a mill of the class described, the combination, with a back plate provided with means for attaching it to suitable support and having at its upper end a segmental neck, of a front plate provided with an inner grinding-

surface and having at its upper end a segmental neck, forming with the neck of the back plate an approximately complete circle, and a hopper having a circular lower end adapted to encircle said neck and bind its parts together, substantially as and for the purpose set forth.

2. The combination, with a back plate provided with means for fastening it to a suitable support, of a front plate interlocked at its lower end with the back plate and provided with an inner grinding-surface, and a hopper locking together the upper ends of said plates and forming therewith the frame of the mill, substantially as and for the purpose set forth.

3. The combination, with the back plate A, having an extension A′ and a semi-cylindrical neck *a*, of the front plate B, provided with hooks *h*, interlocking with the plate A and the semi-cylindrical neck *b*, and the hopper C, whose circular lower end encircles and binds together the two semi-cylindrical necks *a b*, substantially as and for the purpose set forth.

4. The combination, with the back plate A, having a semi-cylindrical neck *a*, provided with the flanges *a′ a″*, separated by a V-shaped annular groove, and the front plate B, having a semi-cylindrical neck *b*, provided with the flanges *b′ b″*, separated by an annular V-shaped groove continuous with the groove in the back plate, of the hopper C, formed with the marginal lugs *c*, adapted to pass downward through the notches *n* in the flange *b′* and to be rotated into positions in the V-shaped groove, thereby drawing the parts of the neck together and drawing the hopper downward upon the flange *a″ b″*, substantially as and for the purpose set forth.

5. In a mill of the class described, the combination, with a grinding-shell having its axis horizontal, of a grinding-cone conforming substantially to the said shell and provided with a horizontal shaft or spindle journaled in a bearing formed on the shell and provided with a terminal screw-threaded bolt, a crank or handle mounted on said spindle, and a nut engaging said screw-threaded bolt, a guard inclosing said nut and formed at its inner end with notches engaging a lug upon the crank or handle, and a spring interposed between the nut and guard and tending to hold the notches of the guard in engagement with the lug upon the handle, substantially as and for the purpose set forth.

6. The combination, with the hopper, the front plate B, formed with a grinding-shell B′ and neck *b*, and the grinding-cone D, lying within said shell, of the back plate A, provided with a neck *a*, having the lip *l* extending over the space between the margin of the cone and the face of the back plate, thereby preventing the admission of unground material to the space between the cone and back plate, substantially as and for the purpose set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

CHARLES MORGAN.
EDGAR H. MORGAN.

Witnesses:
R. H. WILES,
ALFRED ZAPF.