

(No Model.)

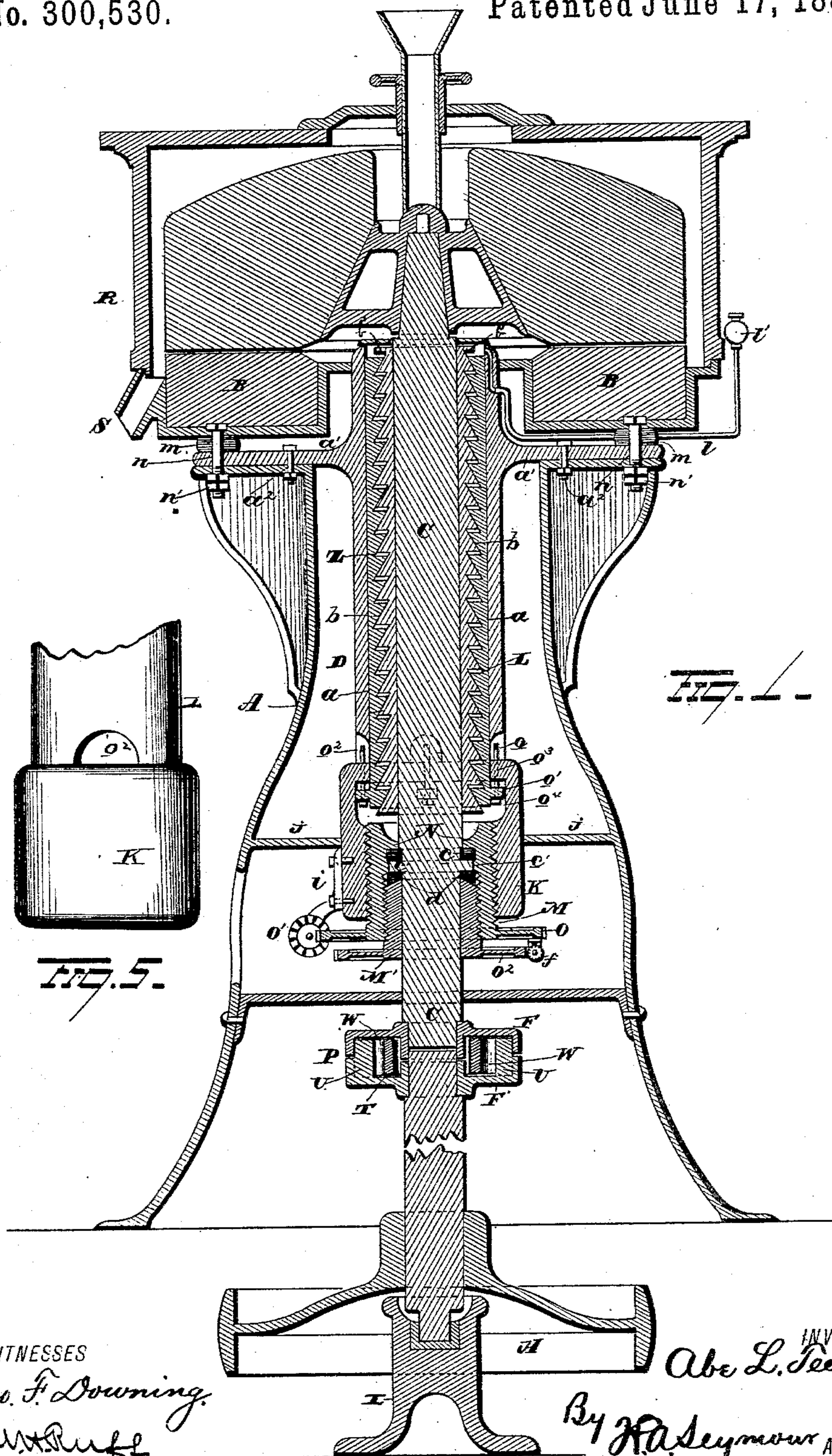
2 Sheets—Sheet 1.

A. L. TEETOR.

GRINDING MILL.

No. 300,530.

Patented June 17, 1884.



WITNESSES
Geo. F. Downing
W. Ruff

INVENTOR
Abe L. Teetor
By *H. Seymour* Attorney

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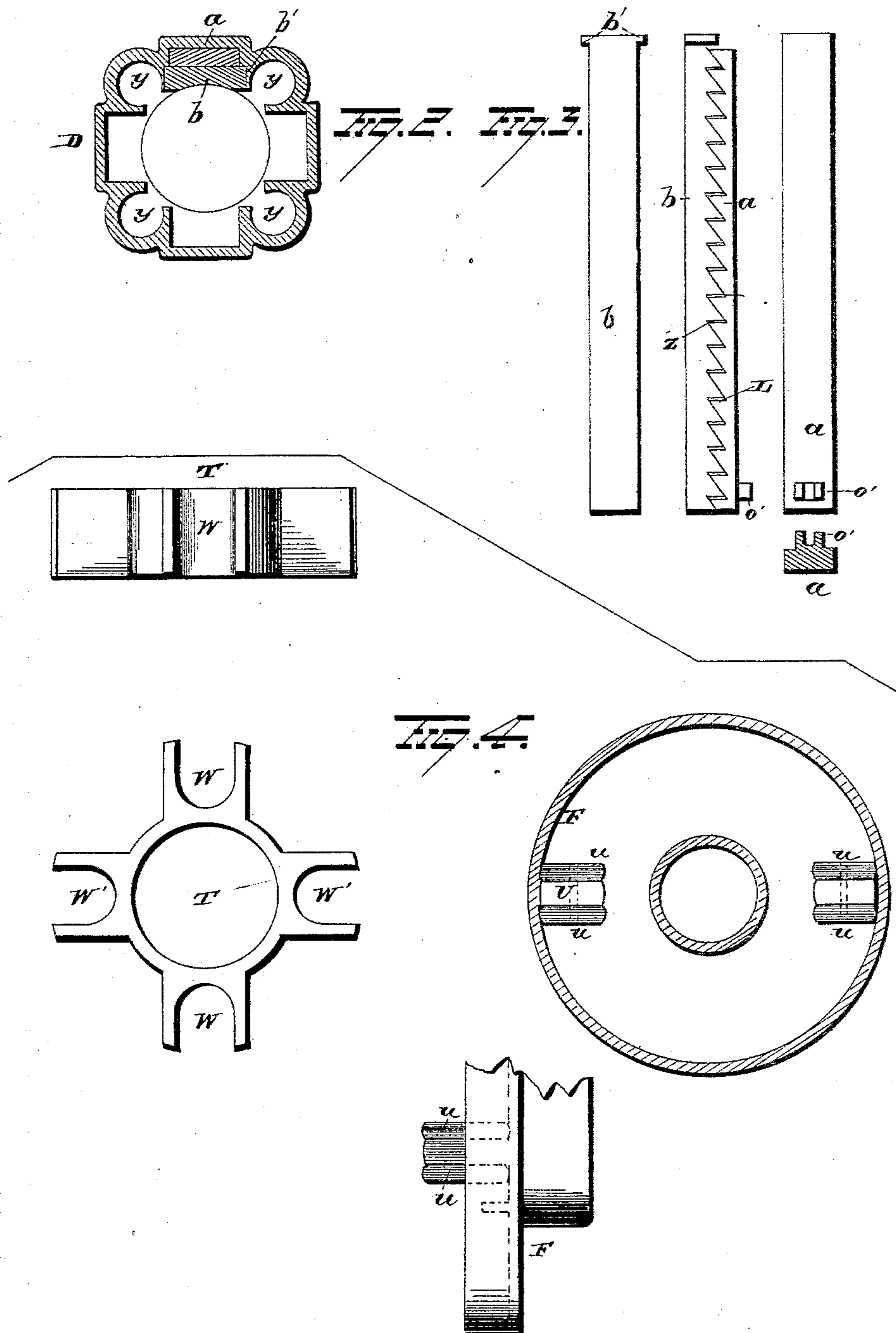
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UNITED STATES PATENT OFFICE.

ABE L. TEETOR, OF CAMBRIDGE CITY, INDIANA.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 300,530, dated June 17, 1884.

Application filed September 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, ABE L. TEETOR, of Cambridge City, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Grinding-Mills; and I 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 appertains to make and use the same.

My invention relates to an improvement in grinding-mills, one object of the same being to provide improved means whereby the lower burr can yield or give when any hard foreign substance is introduced between the burrs. A further object is to provide an improved bushing for the spindle. A further object is to provide improved means for vertically adjusting the upper burr. A further object is to provide an improved spindle whereby the trembling or vibrations of the upper burr caused by backlash is avoided; and with these ends in view my invention consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in vertical section of my improved mill. Fig. 2 is a horizontal sectional view through the bushing and spindle. Fig. 3 is a detached view of the follower and wedges. Fig. 4 represents detached views of the spindle-coupling; and Fig. 5 is a detached view in side elevation of a portion of the bushing.

A represents the base or table, made of wood or metal, singly or combined, as desired, and provided with a central opening for the passage of the bushing and spindle; and B, the bed-stone situated within the casing R, having the discharge-spout S, and trammed by the screws *n* and nuts *n'*. Between the table and casing R are situated the rubber or other suitable yielding blocks, *m*, which latter are each provided with a central opening for the passage of a screw, *n*, adapted to hold the block in position. The bed-stone rests directly on these blocks, and if through accident any foreign substance—such, for instance, as a nail—should be fed to the mill, the lower stone, B, will yield sufficiently to enable it to escape without materially injuring the dress of either stone.

D is the elongated bushing or bearing, provided near its upper end with two or more arms, *a'*, or with a continuous flange, which latter rests on the table A, and is secured thereto by the bolts *a''*. This bushing is also enlarged at its lower end to form a sleeve, K, in the upper end of which is a chamber, *o'*, to receive the lugs *o'*, projecting outwardly from the lower ends of the wedges *a*, and above the upper end of the sleeve K two or more slots, *o''*, are formed at suitable points to receive the upper ends of the screw-bolts *o*. These bolts are threaded to engage female threads in the web *o''*, forming the lower ends of the slots *o''*, and are swiveled at their lower ends to the lugs *o'* of the wedges. The upper ends of the screws are made angular to enable them to be turned by a removable key, which latter is introduced through suitable openings formed in the table. By turning the screws in one direction the wedges *a* are elevated, and by turning them in the opposite direction they are lowered. In this construction the wedges are operated independently of each other; but it is evident that they could be connected together so as to move simultaneously and accomplish the same result. The inner face of each wedge is provided with a vertical series of steps, L, forming a series of small wedges. In this instance I have shown four wedges adapted to operate four followers; but the number of followers and wedges can be increased or decreased as necessity demands. Each follower *b* rests opposite its respective wedge, and is provided on its outer face with a series of small wedges adapted to coact and register with the steps of the wedges *a*. From the foregoing it will be seen that by elevating the wedges *a* by the screws *o* the followers are relieved of the pressure of the wedges, and by turning the screws in the opposite direction the wedges are lowered, which force or press the followers against the spindle, and consequently prevent the latter from wobbling.

The sleeve K, which is an enlarged continuation of the bushing and formed integral therewith, is provided with female screw-threads, by means of which the adjustable collar M is secured thereto. This collar is provided with an annular flange, N, which latter rests above the flange *c'* of the spindle C, a ring of some

suitable metallic composition, however, being inserted between the flanges to prevent them from coming together. This collar M is provided at its lower end with the worm-wheel 5 O, which latter meshes with the worm O', journaled in the bracket i, secured to the sleeve K. This collar is provided with female screw-threads for the attachment of the collar M', which latter is screwed therein, and is pro- 10 vided with a worm-wheel, O², adapted to be turned by the worm-shaft f, journaled to the under side of the wheel O. The upper end of the collar M' is beveled and rests below the flange c', a beveled metallic ring, d, of the 15 same composition as the ring c, resting between the said flange and collar.

From the foregoing it will be seen that as the worm f is journaled to the under side of the wheel O and engages the wheel O², wheels O and 20 O² are caused to move simultaneously in the same direction when the worm O' is turned. When it becomes necessary to adjust the flange of the outer collar and the upper beveled end of the inner collar toward the flange c' of the spin- 25 dle, the worm O' is turned so as to draw the flange of the outer collar toward the flange on the spindle. This movement also lowers the inner collar, M', an equal distance, and the latter is then elevated independently of the outer 30 collar by turning the worm-shaft f. When the collar M and collar M' are respectively adjusted down and up, the flange c' of the spindle is firmly clamped between the metallic rings. If the worm O' be turned in either di- 35 rection, the collars M and M', which are locked together by the worm f, are caused to move simultaneously up or down and either elevate or lower the upper stone. The worms O' and 40 f are to be operated by an attendant as occasion may require, and to this end their shafts may be fitted with hand-cranks, or the ends thereof may be squared to receive a suitable key.

The spindle C is secured to the upper stone 45 and passes downwardly through the bushing, the extreme lower end thereof resting on the step I.

The bushing or bearing D is supported at its upper end, so that all the expansion and 50 contraction will be downward, and as the spindle is supported at its lower end, it follows that its expansion and contraction are upward, and hence when the spindle elongates from friction the bushing also elongates from con- 55 tact with the spindle, but in an opposite direction thereto, and hence the stones are always retained in the same relative position. As before stated, the beveled composition ring d rests on the upper beveled surface of the collar M'. This ring, under ordinary cir- 60 cumstances, is adapted to closely embrace the spindle; but when it becomes highly heated it expands and gradually falls down the inclined end of the collar M', and is consequently pre- 65 vented from being immovably wedged or pressed against the flange c'.

The bushing D is provided with cavities or recesses for the wedges a and followers b, and is also provided between said cavities with the smaller cavities y, which latter are adapted to 70 be filled with waste or any suitable material that will hold lubricating-oil in suspension. This cotton or waste bears directly against the spindle, and consequently keeps the same lu- 75 bricated throughout the entire portion thereof inclosed by the bushing. The followers b—four in the present instance—are situated equidistant from each other around the spindle, and are each provided at the top with the later- 80 ally-projecting lugs b', which latter are adapted to project over the bushing and wedge for the purpose of holding the follower up in position. The wedges a and followers b are preferably made of the same material, so that 85 their expansion and contraction will be the same. Thus it will be seen that when the friction caused by motion of the spindle causes a rise in the temperature of the follower the heat will be conducted directly to the wedges 90 a, and both will elongate simultaneously, the small spaces Z between the teeth being purposely left to enable the plates or wedges and followers a and b to approach each other with- 95 out becoming wedged. This bushing is lubricated by the cup l', which latter is connected to the lubricating-spaces in the bushing by the pipe l, the cup l' being situated above the bush- 100 ing to enable the oil to flow therefrom by gravity.

The spindle C is divided at any suitable 100 point below the bushing D, and the two parts thereof are connected together by the flexible coupling P, which latter is composed of the plates F and F', rigidly secured to the two 105 parts of the spindle. The plates F F' are each provided with two projecting arms, U, arranged diametrically opposite to each other, the arms of the plate F resting at right angles or between the arms of the plate F'. These 110 arms are each provided on opposite faces with yielding cushions u, which latter are adapted to rest within the yokes W W' of the spider T, the spider thus serving to lock the plates F and F' securely but yieldingly together. 115 The lugs or arms U of one of the plates F F' rest within the yokes on opposite sides of the spider, and the lugs of the other plate rest within the other yoke—say, for instance, W'. Each plate F F' is provided with a half-flange, 120 and when the two plates are brought together the spider is inclosed between them, and is prevented from displacement and concealed from view. This construction forms a double cushion, so that if there is any backlash 125 created it is taken up without causing any trembling in the driven stone.

The pulley H is provided with curved arms, whereby the hub thereof is enabled to rest a considerable distance above the step I, while 130 the rim thereof rests in the same horizontal plane with the step. This construction takes the strain off that portion of the spindle be-

tween the step I and the coupling and bushing, and consequently prevents the spindle from flexing, as it would do if the power were applied at a point between the step and coupling. The bushing is laterally supported near its lower end by the ribs *j*, which latter do not interfere, however, with the expansion or contraction of the bushing.

It is evident that slight changes in the construction and relative arrangement of the several parts might be resorted to without departing from the spirit of my invention; and hence I would have it understood that I do not confine myself to the exact construction shown and described, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. The combination, with a suitable runner or upper stone and table, of a bushing suspended from the table, a spindle passing through the bushing, and devices whereby the spindle is vertically adjusted at or near the lower end of the bushing, substantially as and for the purpose set forth.

2. The combination, with a runner or upper stone and table, of a bushing secured at or near its upper end to the table, and a spindle supported at or near the lower end of the bushing, substantially as and for the purpose set forth.

3. The combination, with a runner or upper stone and table, of a bushing supported at or near its upper end by the table, and provided at its lower end with collars, and a spindle having a flange, which latter rests between the collars, whereby when the latter are vertically adjusted the spindle is also moved in the same direction, substantially as set forth.

4. The combination, with a runner or upper stone and table, of a depending bushing, the sleeve K, collars M M', the spindle pro-

vided with the flange *c'*, and devices for turning the collars simultaneously in the same direction, substantially as set forth.

5. The combination, with a runner or upper stone and table, of a depending bushing, the sleeve K, collars M M', provided, respectively, with worm-wheels O and O', the spindle provided with the flange *c'*, the rings *c* and *d*, the worm-shaft O', and devices for locking the worm-wheels together.

6. The combination, with an elongated bushing and a spindle, of the wedges provided with a series of small steps or wedges, the followers provided with steps adapted to register with the steps on the wedges, and devices for vertically adjusting the wedges, whereby the followers are moved toward and away from the spindle, substantially as set forth.

7. The combination, with an elongated bushing, the spindle, and sleeve K, of the wedges *a*, followers *b*, and screws *o*, whereby the wedges are vertically adjusted, substantially as set forth.

8. The combination, with a two-part spindle, the adjacent ends of each part being provided with a plate having two or more yielding cushions secured thereto, of an interposed spider for connecting the plates, substantially as set forth.

9. The combination, with a two-part spindle, of the plates F and F', provided with the cushioned lugs, and the interposed spider, substantially as set forth.

10. The combination, with a divided shaft, the two parts of which are yieldingly connected together, of the pulley H, the arms of which are curved, so that the power will be supplied to the shaft on a line with the step supporting the shaft, substantially as set forth.

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

ABE. L. TEETOR.

Witnesses:

CHARLES A. HUGHES,
KNOX PORTER.