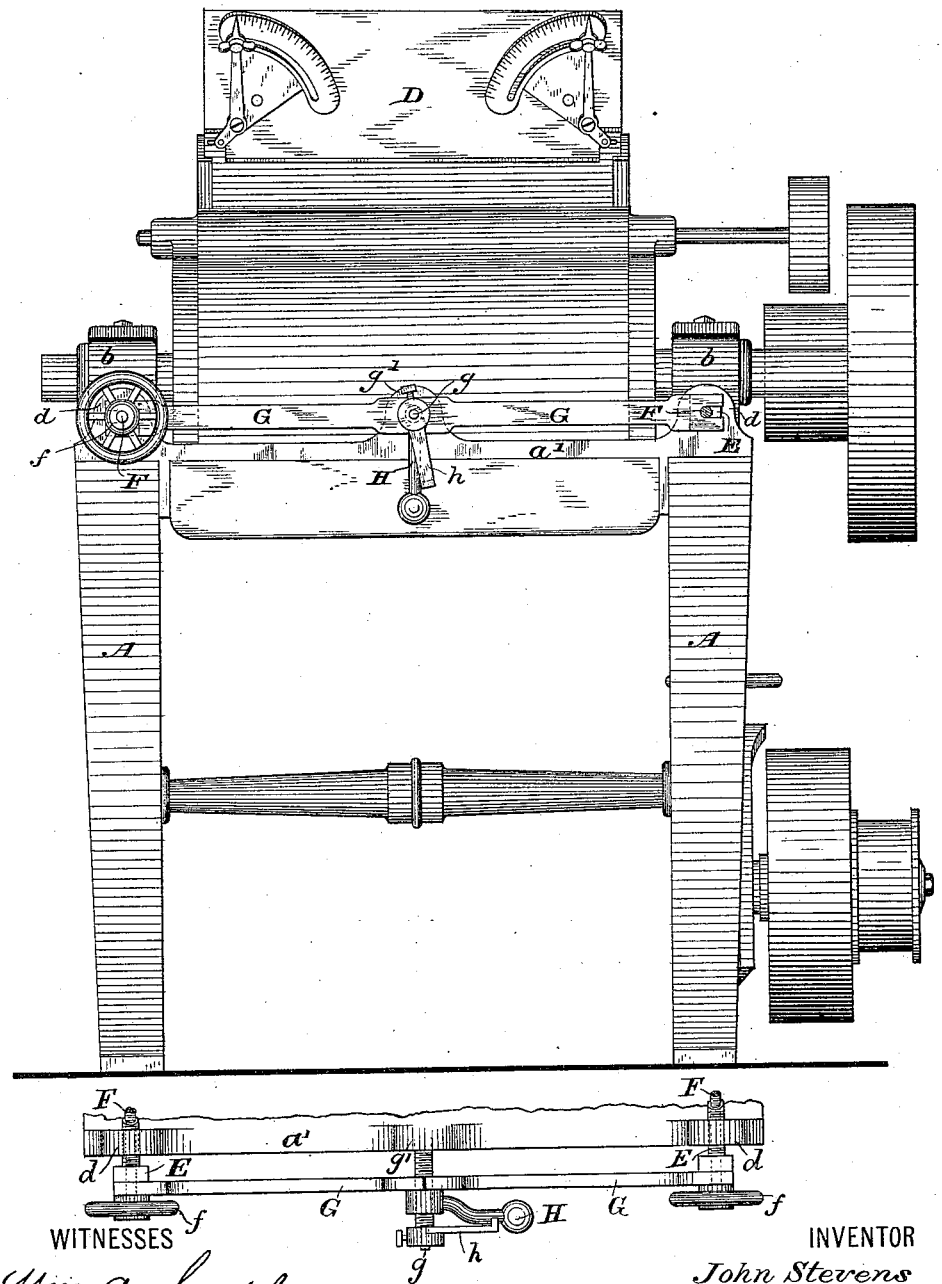
(No Model.) 3 Sheets—Sheet 1.

J. STEVENS.

ROLLER MILL.

No. 304,468. Patented Sept. 2, 1884.

Fig. 1.



WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

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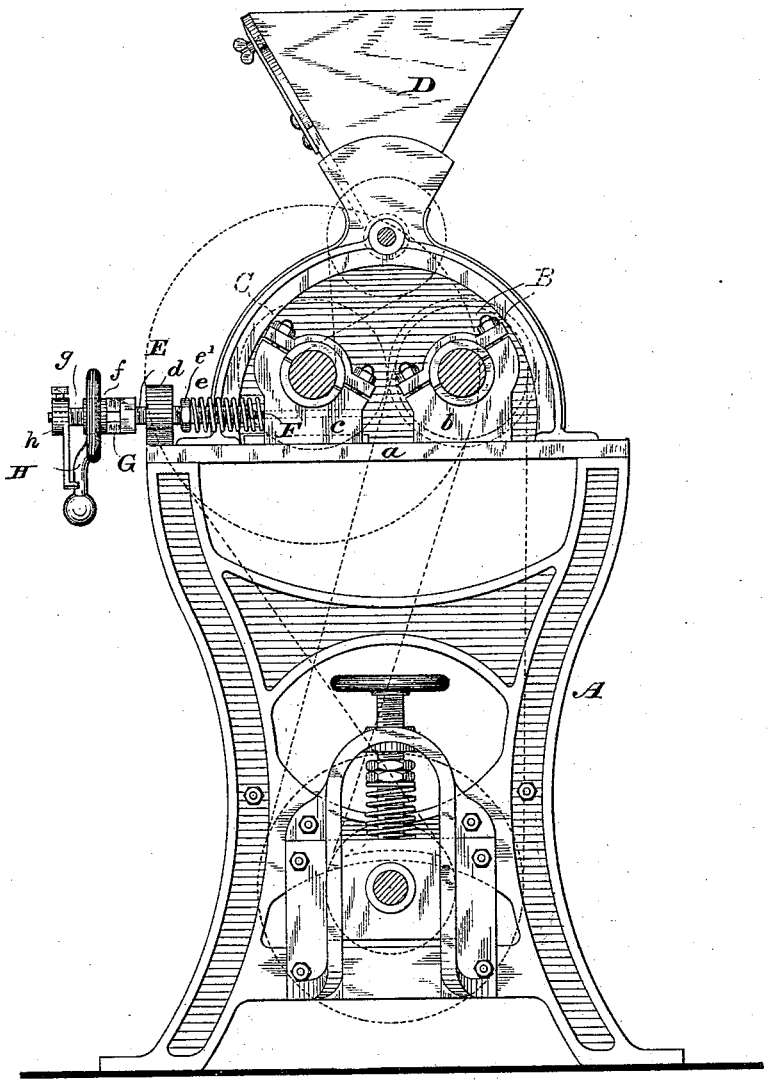
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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ROLLER MILL.

No. 304,468. Patented Sept. 2, 1884.

Fig. 3.

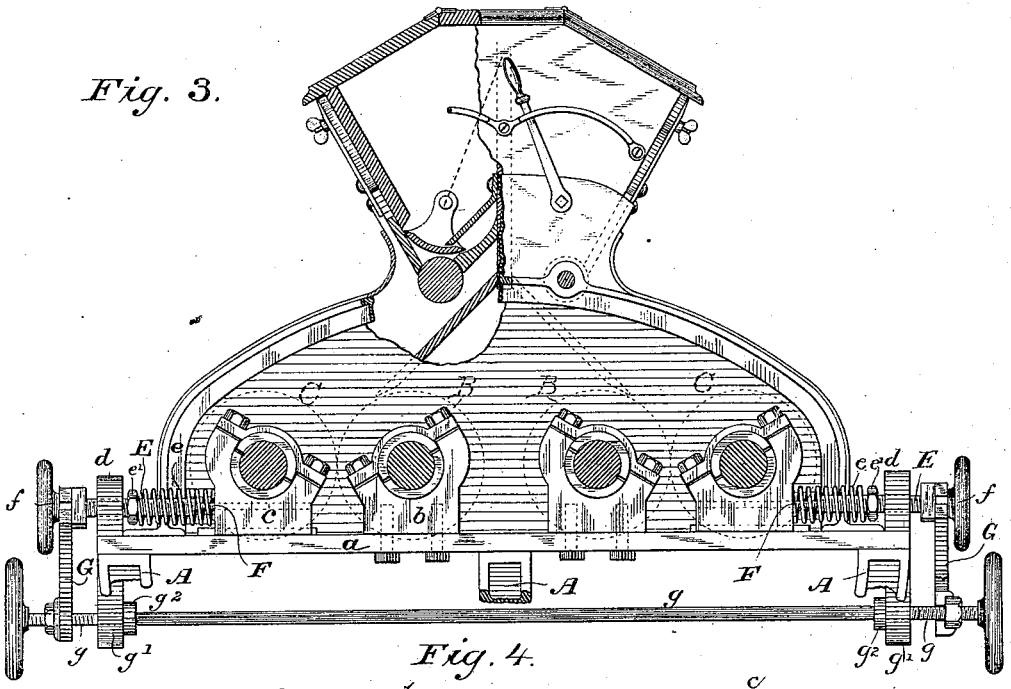
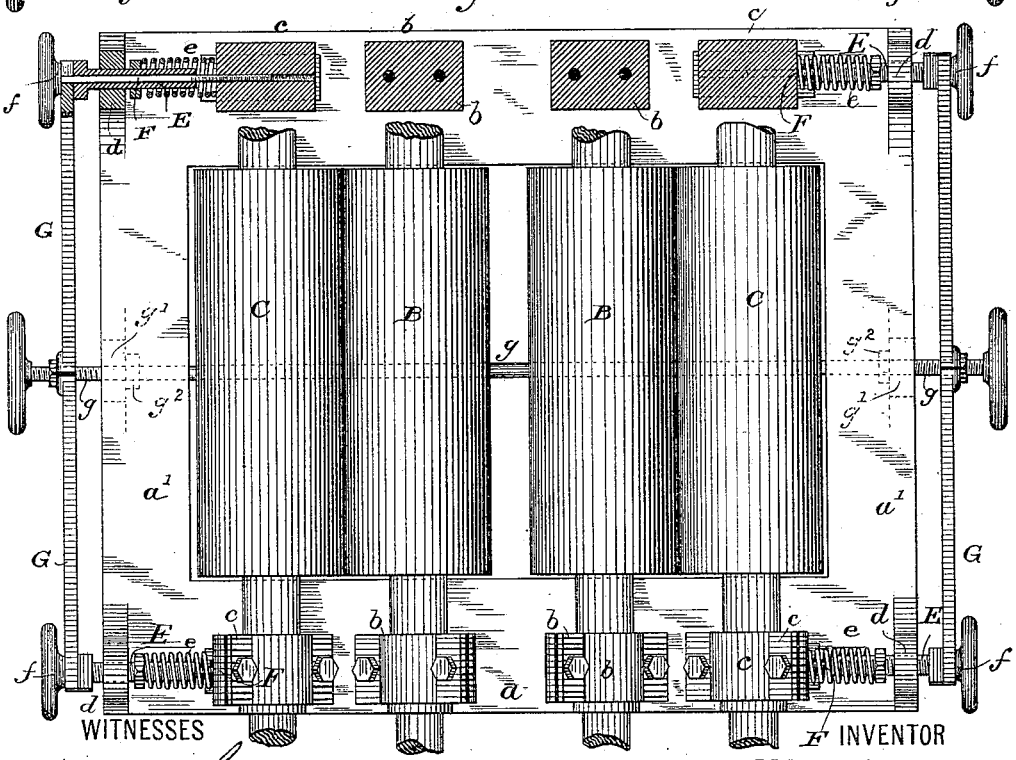


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN STEVENS, OF NEENAH, WISCONSIN.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 304,468, dated September 2, 1884.

Application filed December 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN STEVENS, of Neenah, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Roller-Mills for Grinding Grain and other Materials, of which the following is a specification.

Roller-mills for the reduction of cereals, as now universally constructed, have one roll of a pair mounted in movable bearings, either swinging upon an adjacent pivot or sliding in ways upon the bed-plate. Springs are arranged to press these bearings in toward the stationary bearings of the other roll and permit them to temporarily yield therefrom, and adjusting devices are provided, as a rule, whereby the stress of these springs may be increased or diminished and the limit determined to which the yielding roll may approach the other or recede therefrom. Instrumentalities are also employed, in order at any time to quickly and effectively throw the rolls apart or bring them together without disturbing the set of these adjusting devices. When the bearings swing upon pivots, they are thrown out and in bodily with their springs and adjusting mechanism. When, on the other hand, they slide upon the bed-plate, their compulsion out is against the stress of the springs, which serve to return them as soon as freed—as, for instance, in an application filed by me on the 13th day of December, 1881.

My present invention relates in part to generic improvements upon instrumentalities of this nature—that is, instrumentalities designed to throw the movable bearings temporarily out from the stationary bearings without regard to their regular adjusting devices—and in part to specific instrumentalities designed to effect this end in connection with adjusting devices made the subject of Letters Patent heretofore granted me—to wit, on the 3d day of August, 1880, No. 230,834, and 19th day of April, 1881, No. 240,282; and it consists in combining with the long adjusting-screws of my aforesaid patents, and with the coacting springs, levers arranged to act upon the heads or hubs of said screws and extending to a central meeting-point, and a common controlling device for moving the ends of said levers to retract or let in the yielding roll simultaneously at each end; in combining with said long adjusting-screws and their coacting springs levers arranged to act upon the heads or hubs of the screws and extending therefrom to a central meeting-point, a common controlling device for moving said levers to throw the yielding roll out or let it in, and an adjustable stop barring the action of said controlling device whenever in its inward movement the yielding roll reaches its predetermined proximity to the other; in combining with said long adjusting-screws and their coacting springs levers arranged to act upon the heads or hubs of said screws and extending therefrom to a central meeting-point, a screw-rod at said point over which the ends of the levers take, and a hand-nut working upon said rod or hand-wheel, whereby it is turned to move the levers; in combining with said long screws the springs, the levers for throwing in and out, the central screw-rod common to both levers, and the hand nut or wheel, an adjustable stop to bar the revolution of said nut or wheel in that direction calculated to bring the rolls together whenever in its inward movement the yielding roll has reached its predetermined grinding adjustment; in forming the levers with cupped or yoke-shaped ends which take over the shank of the long screw and the spindles of the screw-rods, respectively, and constitute the means whereby said levers are supported in the machine, and in such other combinations and details of construction as are hereinafter described and claimed.

In the drawings, Figure 1 is an end elevation, and Fig. 2 a side view, of a single roller-mill embodying my invention; Fig. 3, a side elevation, and Fig. 4 a top plan view, of a double mill with the invention applied thereto.

A represents the frame of the machine, of any approved or suitable construction. Supported upon the bed-plate *a* of this frame are fixed blocks *b*, which form or afford bearings or boxes for the gudgeons of the stationary roll B, and other sliding blocks, *c*, receiving the gudgeons of the yielding roller C. Gearing such as usual in this class of machines will be provided to drive the rolls at the requisite

speeds and in the intended direction, and above them is placed the ordinary hopper, D, with its feed-roller and regulating-gates.

As in my aforesaid patents, hollow adjusting-screws E are set in lugs *d* projecting from the bed-plate, these screws serving to limit the outward movement of the yielding blocks or boxes. Encircling said screws are the coiled springs *e*, bearing at one end against the blocks, and serving to receive their outward thrust and return them constantly, with the roll which they carry, inward toward the opposite roll, and at the other end seated against the adjustable nuts *e'* upon the screws, whereby their stress may be varied as found advisable. Through the hollow screws pass the smooth spindles of the long screws F, provided at their outer ends with a hand piece or wheel, whereby they can be turned, and at their inner ends are threaded into sockets in the sliding boxes, to adjust these and the roll they carry independently at each end of the latter, securing its proper alignment, and to determine primarily the limit to which said roll can approach the other. Now, in order to momentarily or temporarily throw the yielding roll back against the force of its springs and to let it return to its grinding position without disturbing the set of the above-mentioned adjusting devices, or any one of them, as well as also to serve as means for controlling or effecting the adjustment between the rolls simultaneously along their whole length, I provide levers G, cupped or recessed at each end and diverging from a central meeting-point to the adjusting devices on either hand, each lever, in the present instance, at one end partly embracing the shank of the corresponding long screw and bearing against the inner face of its hub *f*, and at the other taking over the spindle of a screw-rod, *g*, entering into or projecting from a lug, *g'*, located centrally of the cross-piece *a'* of the bed-plate. To afford a fulcrum for these levers, the heads of the hollow screws E may be turned off true and the levers seated upon their outside inner edges, or lugs may project from the bed-plate at any proper point.

In the construction shown in the first two figures the screw-rod *g* is fixed to the lug on the bed-plate, although it is evident that it will be the same device mechanically if threaded therein. In the first case a hand-nut, H, is applied, which being turned or whirled down, the rod will force in the lever-arms, and consequently pry out the long screws, retracting the yielding roll against the force of its springs, and when reversed will let said roll in again simultaneously and co-ordinately at each end. In the second case the screw-rod will have a hand-wheel or crank, its hub resting against the ends of the two levers and controlling them in like manner with the nut as the screw is driven home or let out.

In starting the machine, after a temporary interruption in a given "run," it is desirable that the rolls shall be quickly and accurately brought to their predetermined grinding adjustment for that run, whatever it may be. As one attendant may stop the machine and another have occasion to start it, or as it may not be readily remembered by the proper attendant what the adjustment was from which the rolls were thrown out, and since carelessness is a factor always to be counted upon, it is evident that some positive and variable control over the resetting of the rolls is a desideratum. I therefore apply to the end of the fixed screw-rod *g* a stop, *h*, in shape somewhat like a lathe-dog, making it adjustable along said end by means of a clamping-screw, so that it may be set in or out and intercept and bar the movement of the hand-nut at an earlier or later point as it is whirled out to let the yielding roll in toward the stationary roll. When the screw-rod itself is turned by means of crank or hand-wheel, as above suggested, this adjustable stop may be mounted upon the lug *g'* and its shape suitably changed, or it may be afforded by jam-nuts upon the rod itself, according to circumstances. Its application with differently-constructed instrumentalities for throwing apart the rolls has been illustrated in another application already filed by me, wherein, however, it is not broadly claimed.

In a double mill the yielding roll at each end or face may be independently set in or out; but, as it is generally preferred to throw both out simultaneously, the plan indicated in Figs. 3 and 4 has been contrived by me. Herein the lugs *g'* depend beneath the bed-plate, and the rod *g* passes from end to end of the machine, being held against longitudinal movement by collars *g²* inside the lugs, and having screw-threads cut for a short distance, where it receives the ends of the levers, the cups in the latter being also screw-threaded, or nuts provided which bear against the outer faces of the levers, and are held against rotation in any suitable manner. With this construction, when the rod is turned by means of its hand-wheel at either end, the levers at both ends will be simultaneously operated.

I claim—

1. The combination, with the bearings of the movable roller, of adjusting mechanism, whereby each bearing can be separately and horizontally adjusted toward or from the opposing roll, mechanism whereby both bearings can be simultaneously and co-ordinately adjusted to regulate the distance between the working-faces of the rolls for grinding, and mechanism whereby both bearings can be simultaneously moved to separate the rolls without disturbing the grinding adjustment, substantially as set forth.

2. The combination, with the bearings of the movable roller, of adjusting-levers G G, mechanism whereby said levers are connected with said bearings, mechanism whereby both levers can be simultaneously and co-ordinately adjusted to regulate the distance between the working-faces of the rolls for grinding, and mechanism whereby both levers can be simul-

taneously moved to separate the rolls without disturbing the grinding adjustment, substantially as set forth.

3. The combination, substantially as hereinbefore set forth, of the yielding roll mounted in movable bearings, the converging levers acting upon the bearings at each end to move the yielding roll away from or let it in toward the other, and means common to both of said levers, whereby they are caused to act in unison to adjust the roll co-ordinately throughout its length.

4. The combination, substantially as hereinbefore set forth, of the yielding roll mounted in movable bearings, the converging levers acting upon the bearings at each end to move the yielding roll away from or let it in toward the other, and the central screw acting upon the power-arms of said levers at their point of meeting to operate them co-ordinately.

5. The combination, substantially as hereinbefore set forth, of the yielding roll mounted in movable bearings, the converging levers acting upon the bearings at each end to move the yielding roll away from or let it in toward the other, the central screw acting upon the power-arms of said levers at their point of meeting, and the adjustable stop to bar the action of said screw and determine the space between the rolls.

6. The combination, substantially as hereinbefore described, of the yielding roll mounted in movable bearings, means for adjusting said bearings independently to carry the roll toward or away from the other, and the converging levers and their central controlling device acting upon the bearings at each end to adjust them simultaneously and co-ordinately.

7. The combination, substantially as described, with the bearings of the yielding roll, of the long adjusting-screws, their coacting springs, and levers arranged to act upon the heads or hubs of said screws to retract them and the bearings into which they take against the force of the springs.

8. The combination, substantially as described, with the bearings of the yielding roll, of the long adjusting-screws, their coacting springs, levers arranged to act upon the heads or hubs of said screws and extending to a central meeting-point, and a common controlling device for moving the ends of said levers to retract or let in the yielding roll simultaneously at each end.

9. The combination, substantially as hereinbefore described, with the bearings of the yielding roll, of the long adjusting-screws, their coacting springs, levers arranged to act upon the heads or hubs of said screws and extending therefrom to a central meeting-point, a common controlling device for moving said levers to throw the yielding roll out or let it in, and an adjustable stop barring the action of said controlling device whenever in its inward movement the yielding roll reaches its predetermined proximity to the other.

10. The combination, substantially as hereinbefore described, with the bearings of the yielding roll, of the long adjusting-screws, their coacting springs, levers arranged to act upon the heads or hubs of said screws to retract them and the bearings into which they take against the stress of the springs, and the hollow or tubular screws affording in their heads a fulcrum for said levers.

11. The combination, substantially as hereinbefore described, with the bearings of the yielding roll, of the long adjusting-screws, their coacting springs, levers arranged to act upon the heads or hubs of said screws and extending therefrom to a central meeting-point, a screw-rod at said point, over which the ends of the levers take, and a hand-nut working upon said rod to actuate the levers.

12. The combination, substantially as hereinbefore described, with the bearings of the yielding roll, of the long adjusting-screws, the springs, the levers for throwing in and out, the central screw-rod common to both levers, the hand-nut, and an adjustable stop to bar the revolution of said nut in that direction calculated to bring the rolls together.

13. The combination, substantially as hereinbefore described, with the two yielding rolls in a double mill, of the levers at each end of the machine, and the single screw-rod taking through the inner ends of both sets of levers.

14. In combination with the adjusting devices at each end of the rolls, the levers formed with cupped or yoke-shaped ends, which take over the shanks of the long screws or equivalent bolts and over the spindle of the screw-rod, respectively, whereby said levers are supported in the machine.

JOHN STEVENS.

Witnesses:
J. SHIELLS,
ALEX. MCNAUGHTON.