

(No Model.)

3 Sheets—Sheet 1.

S. R. CAMPBELL.

ROLLER MILL.

No. 310,374.

Patented Jan. 6, 1885.

Fig. 1.

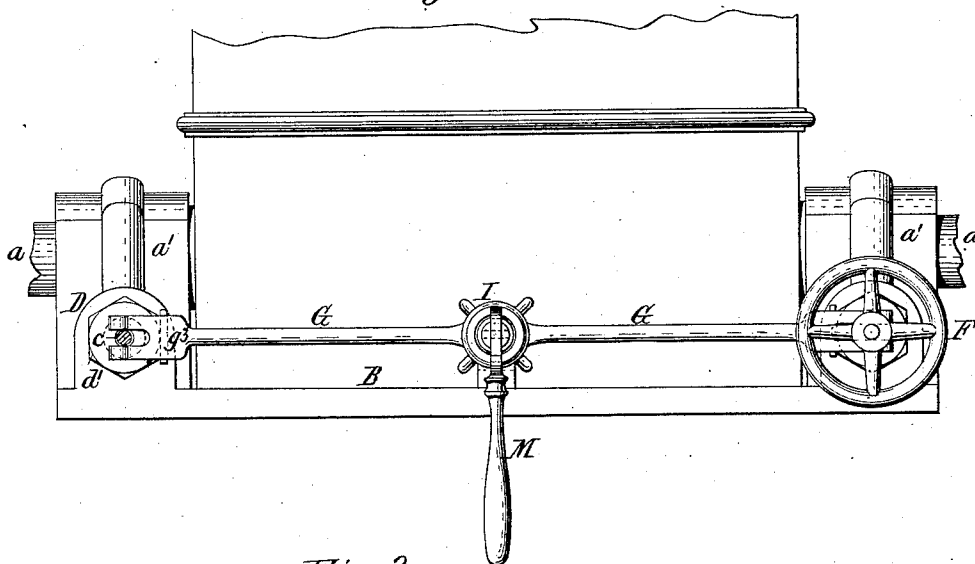
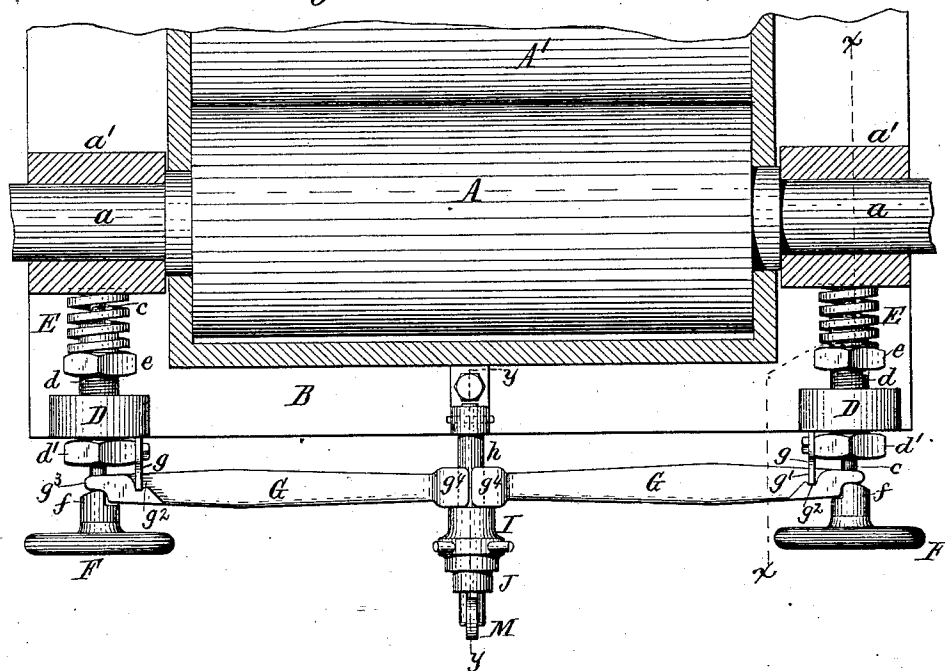


Fig. 2.



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Fig. 4.

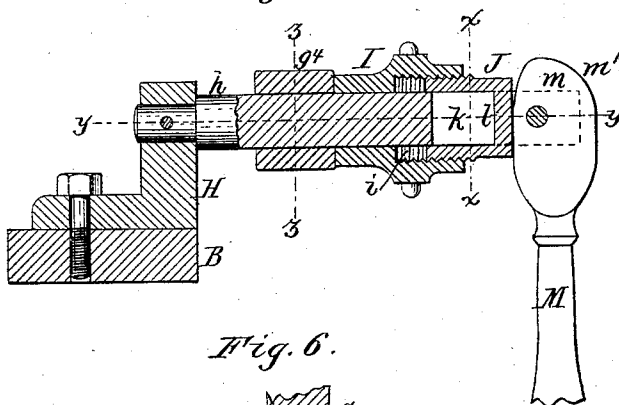


Fig. 5.

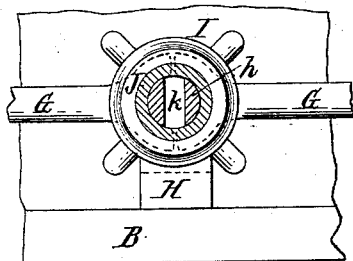


Fig. 6.

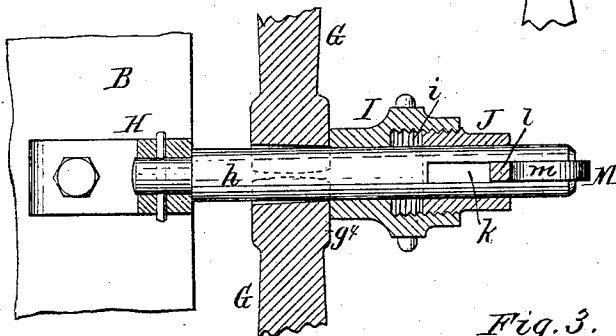


Fig. 7.

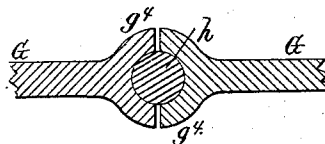


Fig. 3.

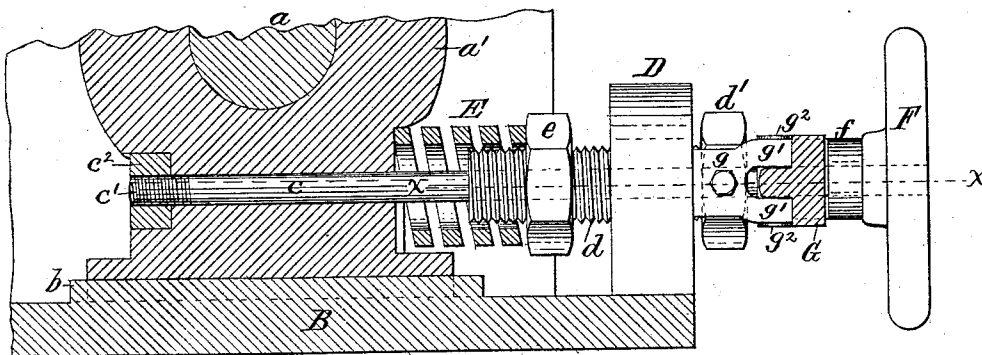
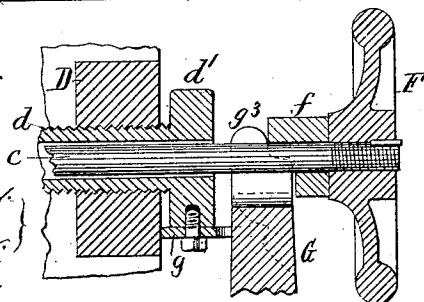


Fig. 8.



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(No Model.)

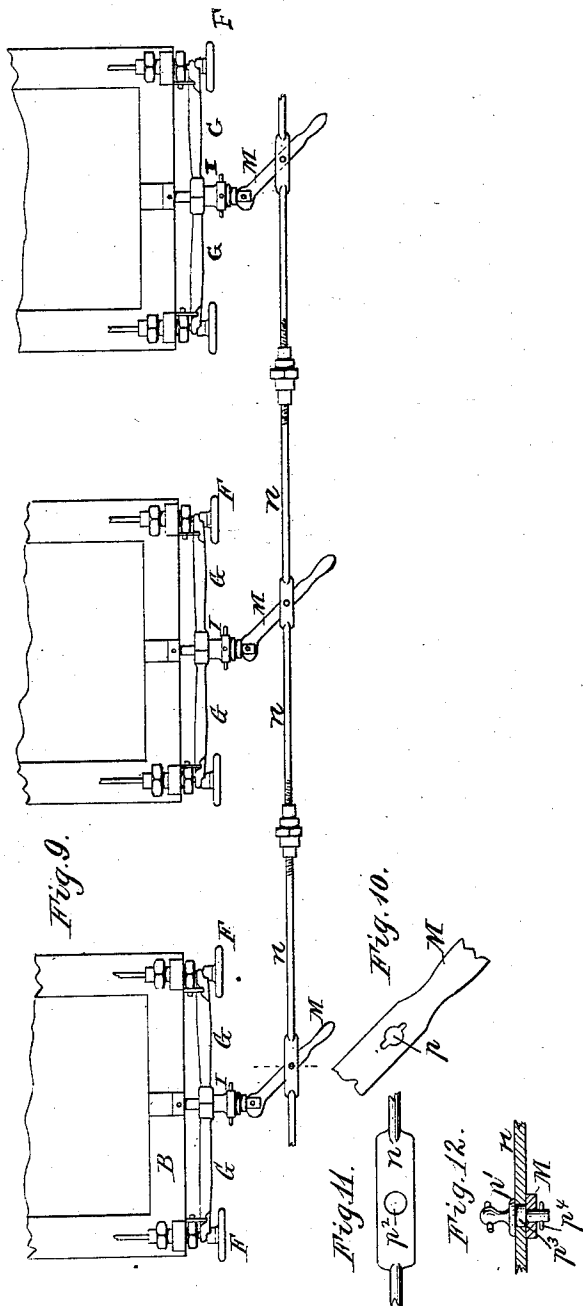
3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

SAMUEL R. CAMPBELL, OF BUFFALO, NEW YORK.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 310,374, dated January 6, 1885.

Application filed March 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL R. CAMPBELL, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Roller-Mills, of which the following is a specification.

This invention relates more particularly to that class of roller-mills which are employed in the reduction of grain and similar substances, and has for its object to facilitate the adjustment and manipulation of the rollers in such manner that the roller which is mounted in movable bearings can be readily separated from the opposite roller for stopping and starting the mill without affecting the adjustment of the roller, and so that each end of the movable roller can be separately adjusted, and that both ends can also be simultaneously adjusted, whereby the movable roller is rendered capable of a quick and free movement toward and from the opposite roller, and at the same time is rendered capable of a very fine adjustment in order to adapt the rollers to the desired work.

My invention consists of the improvements which are hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting of three sheets, Figure 1 is an end elevation of the mechanism whereby the roller mounted in movable bearings is adjusted toward and from the opposite roller. Fig. 2 is a plan view thereof. Fig. 3 is a vertical section in line *x x*, Fig. 2, on an enlarged scale. Fig. 4 is a vertical section, on an enlarged scale, in line *y y*, Fig. 2. Fig. 5 is a cross-section in line *x x*, Fig. 4. Fig. 6 is a horizontal section in line *y y*, Fig. 4. Fig. 7 is a cross-section in line *z z*, Fig. 4. Fig. 8 is a horizontal section in line *x x*, Fig. 3. Fig. 9 is a top plan view representing the adjusting contrivances of a series of roller-mills arranged side by side and all connected together, so as to be adjusted simultaneously. Fig. 10 is a fragmentary view of the adjusting-lever. Fig. 11 is a fragmentary view of the connecting-rod which is attached to the said lever. Fig. 12 is a cross-section of these parts.

Like letters of reference refer to like parts in the several figures.

A represents the roller which is mounted in movable bearings, and A' is the opposing roller. *a* are the journals of the roller A, and *a'* are the bearings in which the journals *a* turn.

B represents the stationary frame of the machine, and *b* the ways upon which the bearings *a'* move toward or from the roller A' in adjusting the roller A toward or from the roller A'.

c are horizontal rods adjustably secured at their inner ends to bearings *a'* by means of screw-threads *c'* and screw-nuts *c''*, the rods being arranged in bores extending through the lower portions of the bearings, as clearly shown in Fig. 3, and the screw-nuts *c''* being held against turning in sockets of the bearings.

d represents sleeves through which the outer portions of the screw bolts or rods *c* pass. The sleeves *d* are provided with external screw-threads working in threaded openings in lugs D, cast on or secured to the frame B, whereby the sleeves are made adjustable in the line of the screw-bolts *c*. The outer ends of the sleeves *d* are provided with heads *d'*, whereby they can be turned in inserting them into the lugs D.

e represents a screw-nut which is applied to the inner threaded portion of each sleeve *d*, and E represents a spiral or other suitable spring interposed between each screw-nut *e* and the outer side of the adjacent bearing *a'*. The springs E tend to hold the bearings *a'* against the screw-nuts *e*, and to draw the bolts *c* inwardly toward the opposing roller, and they also permit the bearings to yield when an unusually large or hard particle enters between the rollers. The screw-nuts *e* permit the tension of the springs to be adjusted.

F represents the hand-wheels, which are attached to the outer ends of the screw-bolts *c* by means of screw-threads and feathers or keys for turning the same, and *f* are collars arranged upon the screw-bolts *c* on the inner sides of the hand-wheels F.

G & G represent two levers, whereby the two screw-bolts *c* of the adjustable roller A are connected, so as to move simultaneously. These levers swing on pivotal supports *g*, which are secured to the inner sides of the heads *d'* of

the threaded sleeves d . The supports g are each provided with two arms, g' , which straddle the lever G and project into recesses g'' , formed on the inner side of the lever, as clearly shown in Figs. 2, 3, and 8. The outer end, g^3 , of each lever straddles the screw-bolt c between the collar f and the sleeve d , and bears against the inner side of the collar f , the latter being constructed with a projection which enters a recess or notch in the end of the lever, as clearly shown in Figs. 2 and 8. The bearing-points of each lever are arranged substantially in a straight line at right angles to the bolt c , whereby the lateral motion of the lever is reduced to a minimum. The inner ends, g^4 , of the levers G straddle a horizontal bolt, h , which is secured to a bracket or support, H , secured to the frame B .

I represents an adjusting sleeve or nut, which is applied to the bolt h , and which bears against the outer sides of the inner ends, g^4 , of the levers G . As represented in Figs. 4 and 6, the sleeve I is provided with an internally-screw-threaded bore, i , in which engages a threaded sleeve, J , which is also movable on the bolt h . The outer portion of the latter, upon which the sleeve J moves, is provided with a longitudinal slot, k , through which passes a bar, l , which is secured to or forms part of the sleeve J .

M represents an adjusting-lever, which is pivoted in the slot k at the outer end of the bolt h , and which is provided at its pivoted end with an eccentric, m , which bears against the bar l of the sleeve J , as clearly shown in Figs. 4 and 6.

The pressure of the springs E draws the bolts c and the hand-wheels F and the collars f , mounted on the outer ends of the said bolts, inwardly and against the outer ends, g^3 , of the levers G . The latter are thereby given a tendency to rock on their pivotal supports, throwing the inner ends, g^4 , outwardly against the sleeves I and J and holding the latter against the eccentric m of the lever M . When the latter is in the position represented in Figs. 4 and 6, the rollers A A' are in their working position.

Upon swinging the lower end of the lever M upwardly the eccentric m forces the collars J and I and the inner ends of the levers inwardly, thereby swinging the outer ends, g^3 , of the levers outwardly and compressing the springs E and drawing the roller-bearings a' outwardly, so as to separate the roller A from the roller A' . The back m' of the eccentric m is concentric with the lever M , so that when the lever is swung to its highest position the lever will be retained in that position by the pressure of the springs holding the collar J against the concentric portion of the face of the eccentric m . A simple upward movement of the lever M moves both bearings a' and the roller A outwardly a sufficient distance to free the working-faces of the rollers, and a simple reverse movement of the lever M returns the

roller A to its former position without in any way disturbing its adjustment.

Upon turning the screw-sleeve I , which is provided with projections for facilitating this operation, the inner ends of the levers G can be moved inwardly or outwardly, thereby causing a proportionately smaller movement in the outer ends, g^3 , of the levers and a corresponding simultaneous adjustment of both roller-bearings a' . As the linear movement of the inner ends of the levers G , caused by the turning of the screw-sleeve I , is considerably reduced, owing to the great difference between the two arms of each lever, a very fine simultaneous adjustment of both bearings of the movable roller is rendered possible by this mechanism.

By turning the hand-wheels F at the outer ends of the screw-bolts c either roller-bearing can be adjusted separately whenever it may become necessary in order to render the working-faces of the rollers parallel with each other. The several prongs of the screw-sleeve I are preferably provided with distinguishing numbers or letters to facilitate the adjustment of the sleeve.

Instead of pivoting the lever M in the slot of the bolt h , the lever may be provided with a sleeve turning on the bolt, and provided with an eccentric or cam shaped face pressing against the sleeve J , or with a cam-shaped groove engaging with a stud on the sleeve J , the lever being held against outward movement by a collar on the stud h .

When two or more roller-mills are arranged side by side, it is often desirable that the rollers should be separated simultaneously in all the several mills in starting and stopping the same. This is readily accomplished by arranging the adjusting-levers M in the several mills in a horizontal position, as represented in Fig. 9, instead of in a vertical position, as represented in Figs. 4 and 6, and connecting the several levers by a rod or rods, n . In order to adapt the length of the connecting-rods n to varying distances between the levers M , the rods are preferably connected by sleeve-couplings, which may engage with right and left hand threads on the adjacent ends of the rods, and permit their ends to be drawn together or separated, as may be necessary in order to connect the levers M . If preferred, the coupling-sleeves may be attached to the rods by set-screws.

The levers M are provided with elongated openings p , through which pass bolts p' , which pass also through openings p^2 in the connecting-rods n , and whereby the rods are attached to the levers in such manner that the connection can be readily broken by removing the bolt p' when it is desired to operate one particular lever independently of the other levers. Each bolt p' is provided with an enlarged shank, p^3 , which fits in the opening p^2 of the rod n , and it is provided below the lever M with a key or cross-pin, p^4 , which can

be passed through the elongated portion of the opening *p* and the round opening *p*² in inserting the bolt, and which locks the parts together by giving the bolt a quarter-turn.

5 I claim as my invention—

1. The combination, with the bearings of the movable roller, of levers *G G*, mechanism whereby said levers are connected with said bearings, an adjusting-nut, *I*, whereby both
10 levers may be simultaneously adjusted, and an eccentric or cam lever, *M*, whereby both levers *G* can be moved without disturbing their adjustment, substantially as set forth.

2. The combination, with the bearings of
15 the movable roller, of the levers *G G*, mechanism whereby the levers are connected with said bearings, a bolt, *h*, screw-sleeves *I* and *J*, and eccentric or cam lever *M*, substantially as set forth.

3. The combination, with the roller *A* and
20 bearings *a'*, of the screw-rods *c*, screw-threaded sleeves *d*, nuts *e*, springs *E*, levers *G G*, hand-wheels *F*, bolt *h*, screw-threaded sleeves *I* and *J*, and eccentric-lever *M*, substantially as set forth.

4. The combination, with the roll-adjust-
25 ing mechanism and adjusting-levers *M* of two or more roller-mills arranged side by side, of rods *n*, whereby said levers are connected, and adjustable coupling-sleeves, whereby the ends
30 of the rods are attached to each other, substantially as set forth.

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Witnesses:

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