(No Model.)

3 Sheets—Sheet 1.

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ROLLER MILL.

No. 348,554. Patented Sept. 7, 1886.

Fig. 3.

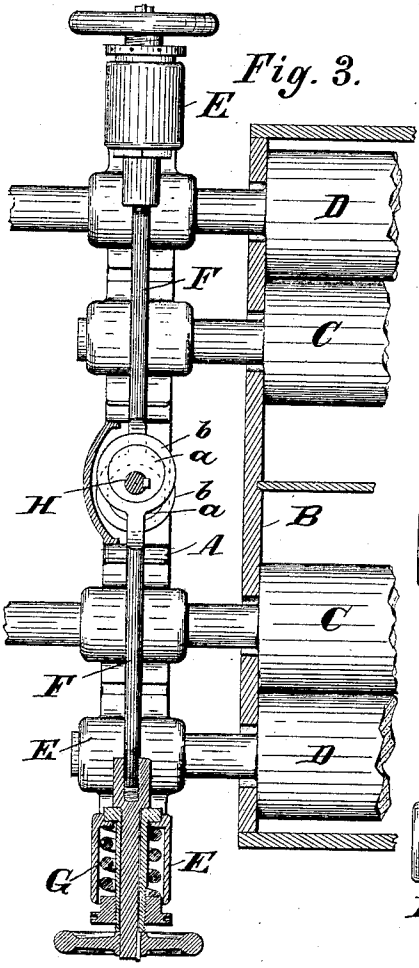


Fig. 2.

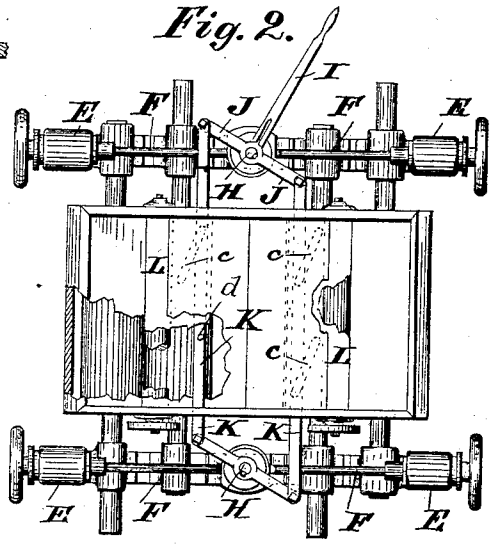
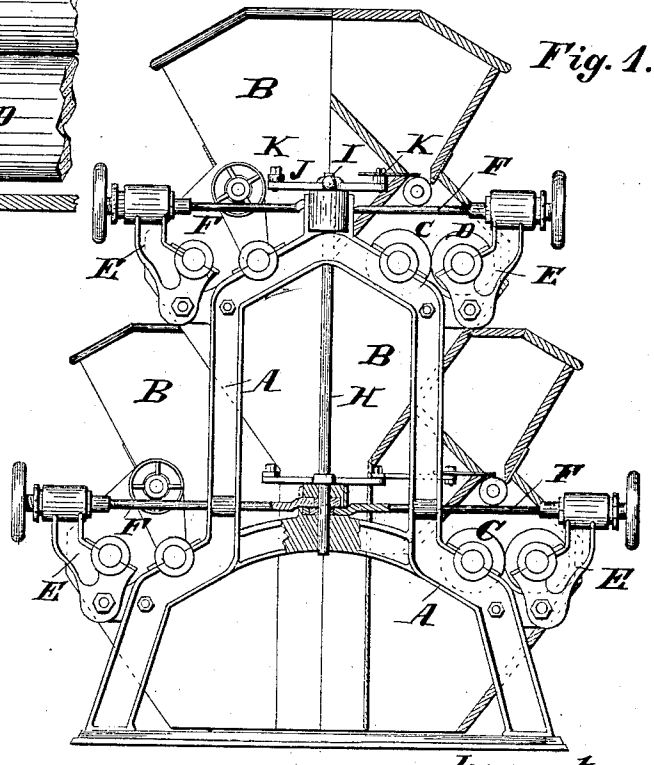


Fig. 1.



Attest
E. C. Rector
Otto Richter

Inventor
Henry J. Gilbert
by Steuart Peck his Atty's.

N. PETERS, Photo-Lithographer, Washington, D. C.

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Fig. 6.

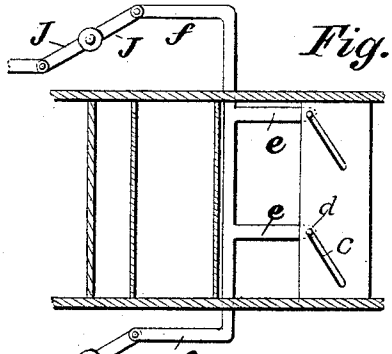


Fig. 4.

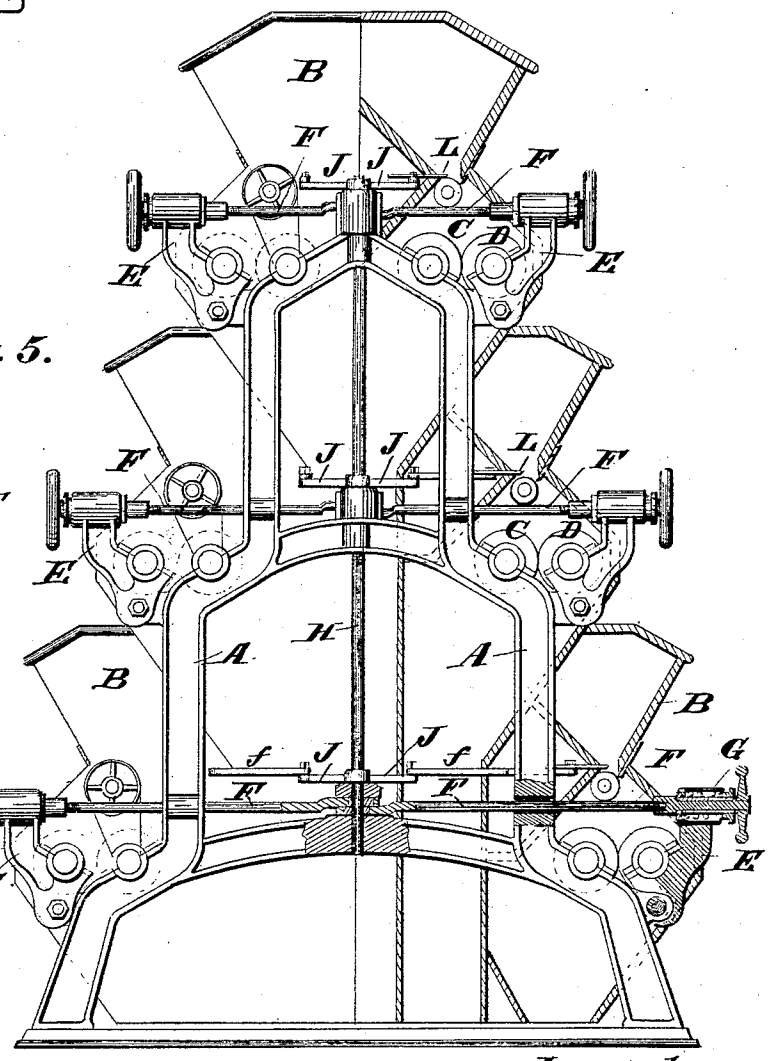
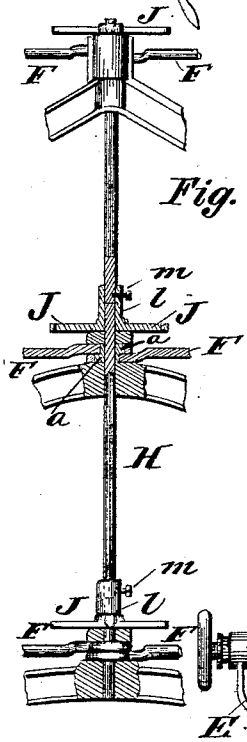


Fig. 5.



Attest
Eco. Rector
Otto Richter.

Inventor
Henry J. Gilbert
by Steuart Beck his Att'ys.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.)

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Fig. 8.

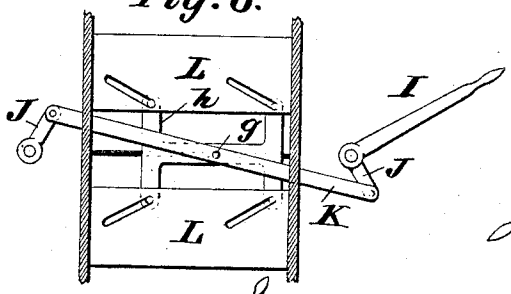


Fig. 9.

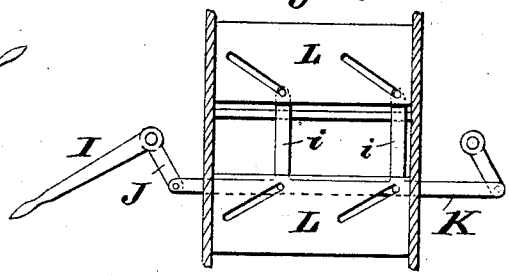


Fig. 10.

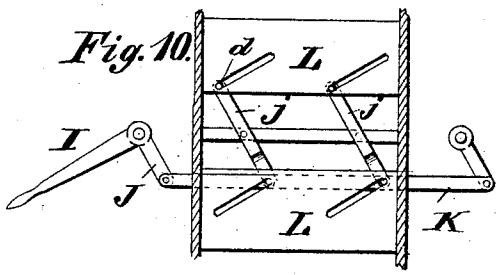


Fig. 11.

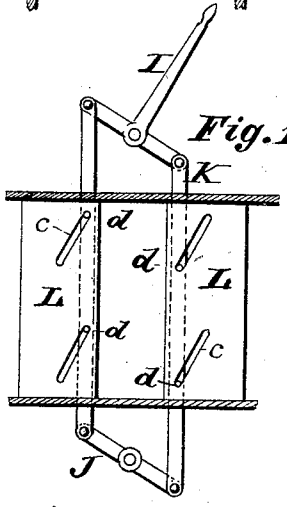


Fig. 12.

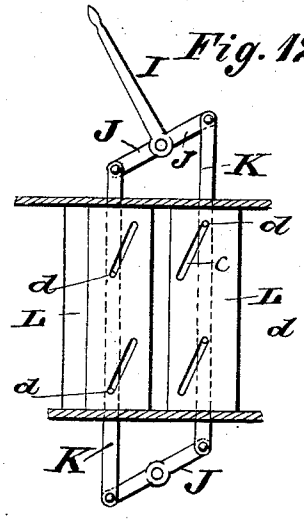
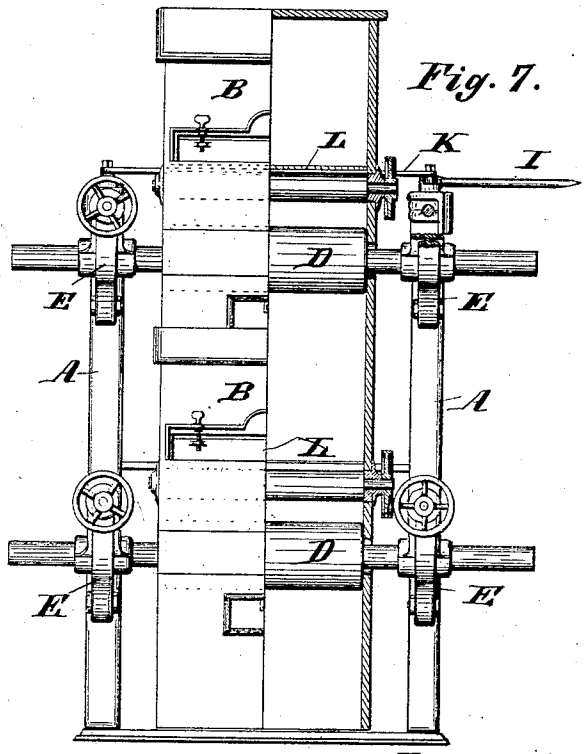


Fig. 7.



Attest
E. C. Rector
Otto Richter

Inventor.
Henry J. Gilbert
by Steuart Peck his Att'ys.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HENRY J. GILBERT, OF DAYTON, OHIO.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 348,554, dated September 7, 1886.

Application filed November 24, 1884. Serial No. 148,690. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. GILBERT, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Roller-Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of roller-mills in which the grain or middlings is fed from a hopper to one or more pairs of differentially-running grinding or crushing rolls, and it relates more particularly to that class of mills known as "gang-mills," having on each side sets of rolls arranged in pairs, one above the other.

The novelty of my invention consists in the combinations of elements employed, as well as in the construction of the parts, all as will be herein set forth and specifically claimed.

In the accompanying drawings, Figure 1, Sheet 1, is a side elevation, partly in section, of so much of a double two-gang mill as is necessary to show the application of my invention. Fig. 2, Sheet 1, is a plan view, partly in section, of the same and with the hopper-covers removed. Fig. 3, Sheet 1, is an enlarged partial plan view, partly in section, of so much of a double three-gang mill as is necessary to show the application of my invention. Fig. 4, Sheet 2, is a side elevation, partly in section, of a double three-gang mill containing my invention. Fig. 5, Sheet 2, is a detail view, partly in section, of a modification of one of the vertical oscillating shafts and its connections. Fig. 6, Sheet 2, is a plan view showing the gate-operating mechanism of the third gang. Fig. 7, Sheet 3, is an end elevation, partly in section, of Fig. 1. Figs. 8, 9, 10, 11, and 12 are plan views representing modifications of the gate-operating mechanism, to be referred to more particularly hereinafter.

The same letters of reference are used to indicate identical parts in all the figures.

The general arrangement of the mill and its driving and tightening pulleys may be the usual or any suitable construction.

In the drawings, A is the frame-work; B, the hopper and chests; C, the inner non-adjustable rolls; D, the outer adjustable rolls journaled in the vibrating or swinging arms E, and F the roll-operating rods with adjustable spring-connections G uniting them to the heads of the arms E.

Journaled vertically in the frame A on each side of the machine, at or near its middle, is an oscillating shaft, H, upon which are keyed or formed so as to turn therewith two diametrically-opposite horizontal cams or eccentrics, *a*, for each pair of opposing journal-arms E, and in line with the heads of said journal-arms. Around these eccentrics *a* are fitted the eyes *b*, formed upon the inner ends of the operating-rods F, as seen more particularly in Fig. 3, and upon either of the shafts H, and preferably at its top, is keyed or otherwise fastened a horizontal hand-lever, I. Likewise keyed to both the shafts H, just above each pair of eccentrics *a*, are cross-arms J, Fig. 2, whose ends are connected by pivoted transverse rods K, extending one under each of the hopper-gates. The hopper-gates L slide horizontally to open or close the feed-channels, and are provided with diagonal slots *c*, in which are confined lugs or bolts *d*, projecting from the upper sides of the rods K, as seen more particularly in Figs. 11 and 12.

From this construction it will be at once apparent that by vibrating the lever I and oscillating one of the shafts H, the other shaft H will be given a corresponding oscillation through the medium of the arms J and rods K. At the same time the swinging arms E will be thrown out to spread the rolls or drawn in to bring them into working contact, and the gates will be closed or opened all simultaneously for the entire sets of rolls and gates, and by a single movement of the lever I. Where the pairs of rolls of the different gangs do not come directly under each other, but are farther apart in each descending gang, the rods K, as seen in Fig. 6, should have extensions *e* for the hopper-gates and coupling-extensions *f* for the arms J, so as to cause an equal movement of all the gates simultaneously.

In Fig. 11 the position of the lever I, arms J, and rods K is shown when the gates are closed, and in Fig. 12 their positions are shown when the gates are open.

Instead of having double arms J and two

rods, K, for each pair of opposing hopper-gates, the construction shown in Fig. 8 may be employed, where single arms J are used, and but one rod is used, which rod is pivoted at *g* to a sliding spider, *h*, such as is contained in the Livingston patent, No. 284,135, August 28th, 1883; or the construction in Fig. 9 may be employed, where the single rod K has extensions I for operating the opposing gate; or again, as in Fig. 10, pivoted vibrating arms *j*, for operating the opposing gates, may be connected to and operated by a single rod, K.

In Fig. 5, representing a three-gang mill, it may be found desirable at times to operate each double gang separately, and to accomplish which I would divide the shaft H into as many parts as there are opposing mills, with their severed ends abutting each other and inclosed in sockets *l*, extending up from and integral with each pair of arms J, as seen in Fig. 5. The upper end of each division of the shaft would be permanently fastened in its socket *l*, while the lower end of the division just above would rest in the socket and be free to turn therein. By providing each division of the shaft H with its own hand-lever the divisions could be operated separately and independently to adjust the rolls and gates to which they were connected, as will be readily understood; and to connect the divisions so that they would all move together and form practically one shaft, set-screws *m* or other fastening devices might be employed, as shown, so that a single movement of any of the levers would operate all of the gates and rolls of the entire machine; or any number might be thus connected and the remainder left independent.

I have only illustrated a two and three gang mill; but it is apparent that any number of gangs may be thus united and operated by a single machine.

Matters herein shown and described, but not claimed, are contained in my prior application, filed November 3, 1884, Serial No. 147,069.

Having thus fully described my invention, I claim—

1. The combination of the main frame, a series of pairs of grinding-rolls arranged above each other, movable journal-arms for one roll of each pair, vertical shafts mounted in upper and lower bearings, connections between said shafts and arms, and means for rotating said shafts to effect the simultaneous movement of all the journal-arms, substantially as set forth.

2. The combination of the main frame, a series of hoppers and pairs of grinding-rolls arranged above each other, movable journal-arms for one roll of each pair, gates for said hoppers, vertical shafts suitably journaled, rods connecting said journal-arms and shafts, devices connecting the shafts and hopper-gates, and appliances whereby the rotation of the shafts effects the simultaneous movement of all the journal-arms and gates, substantially as set forth.

3. The combination of the main frame, a series of pairs of grinding-rolls in sets one above the other, movable journal-arms for one of the rolls of each pair, a sectional vertical rock-shaft on each side of the machine, with mechanism for connecting or disconnecting any of said sections at will, and mechanism uniting each of said sections to its opposing journal-arms, whereby any one or more of said sections may be operated to effect the adjustment of its connected rolls without affecting the others, substantially as described.

4. The combination of the main frame, a series of pairs of grinding-rolls in sets one above the other, movable journal-arms for one of the rolls of each pair, a hopper-gate for each pair of rolls, a sectional vertical rock-shaft on each side of the machine, with mechanism for connecting or disconnecting any of said sections at will, and mechanism for uniting each of said sections to its opposing journal-arms and to its hopper-gates, whereby any one or more of said sections may be operated to effect the simultaneous adjustment of its connected hopper-gates and rolls without affecting the others, substantially as described.

HENRY J. GILBERT.

Witnesses:
ED. W. RECTOR,
OTTO RICHTER.