

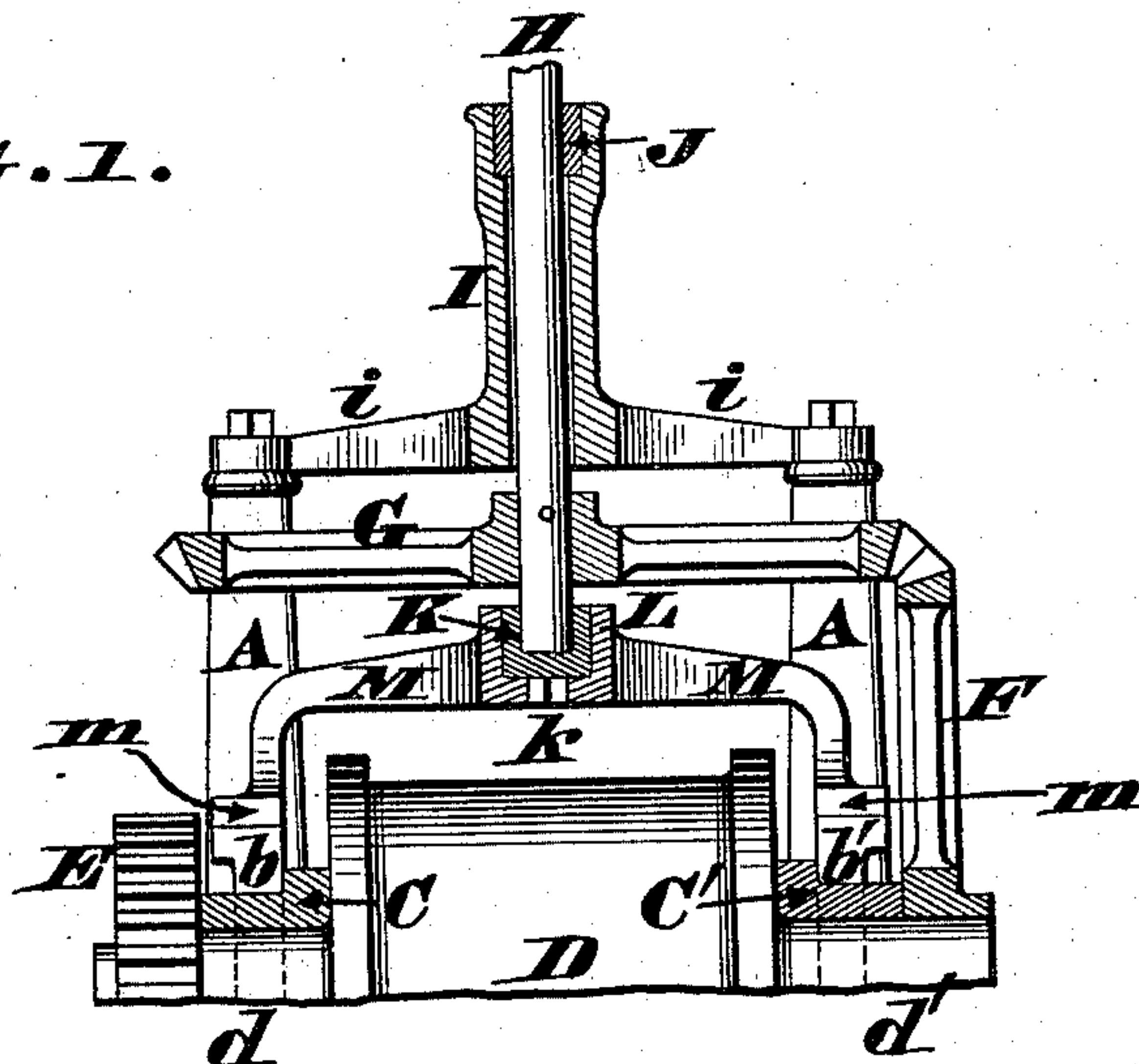
(No Model.)

D. G. COPPIN.  
CANE MILL.

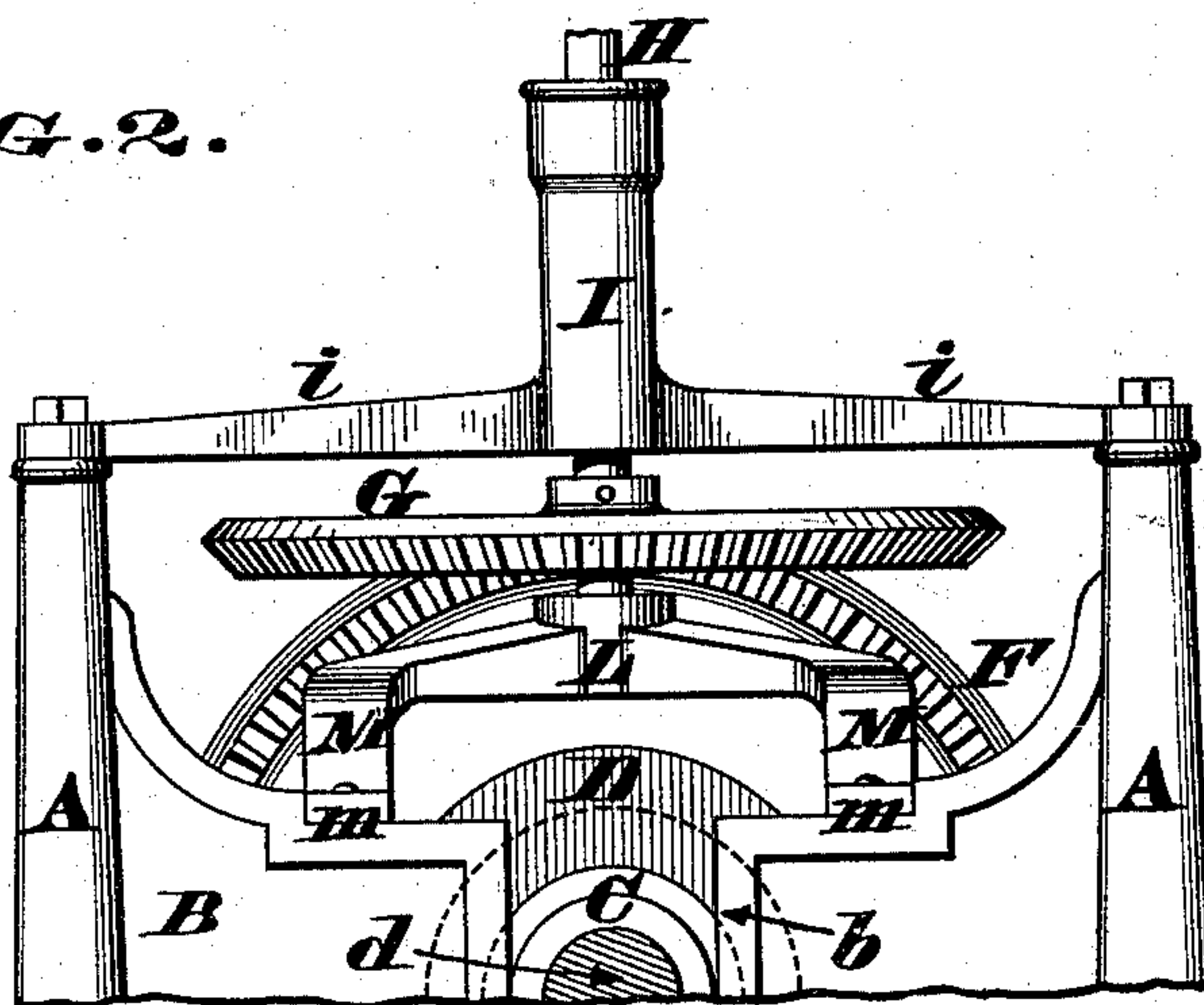
No. 558,638.

Patented Apr. 21, 1896.

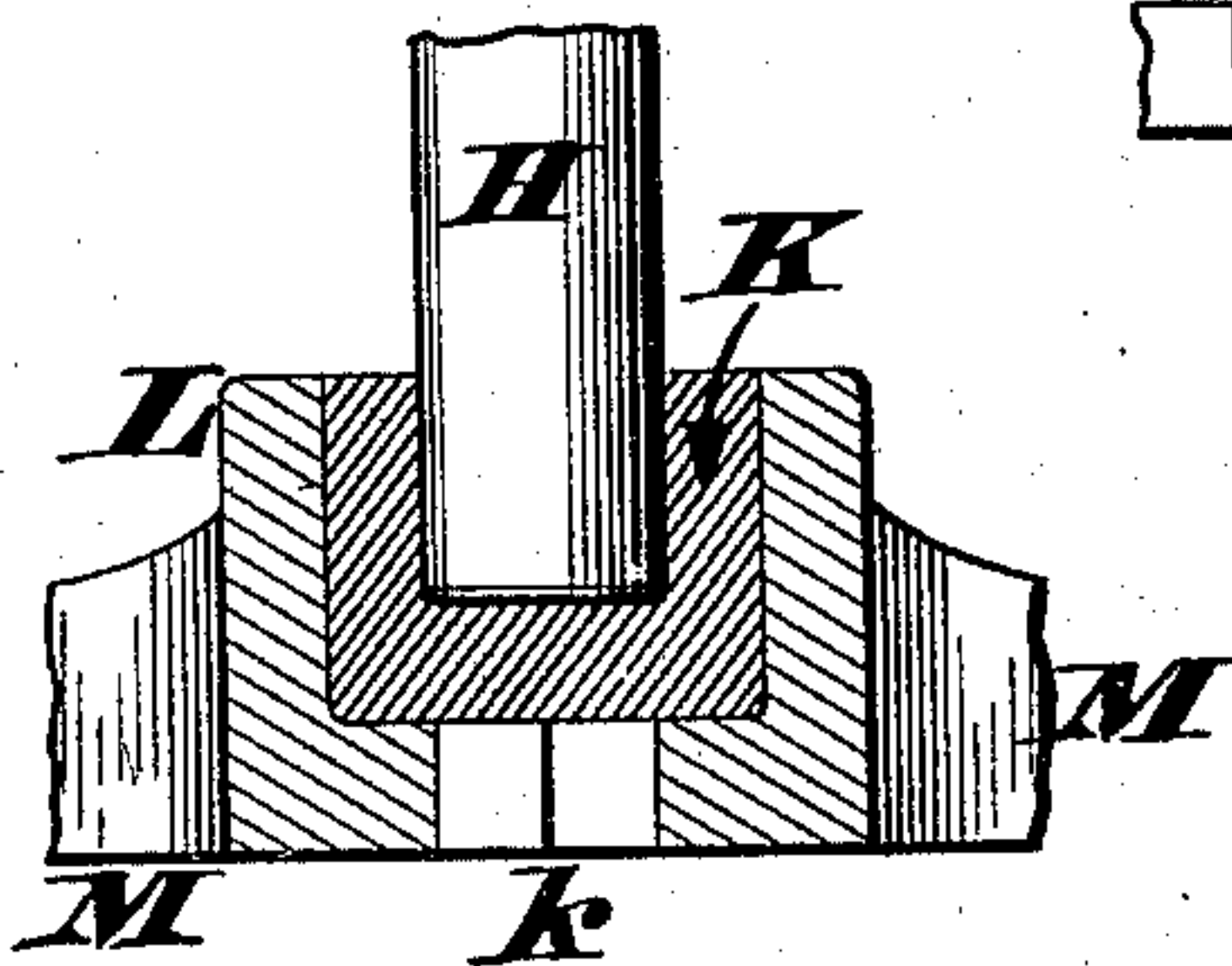
**FIG. 1.**



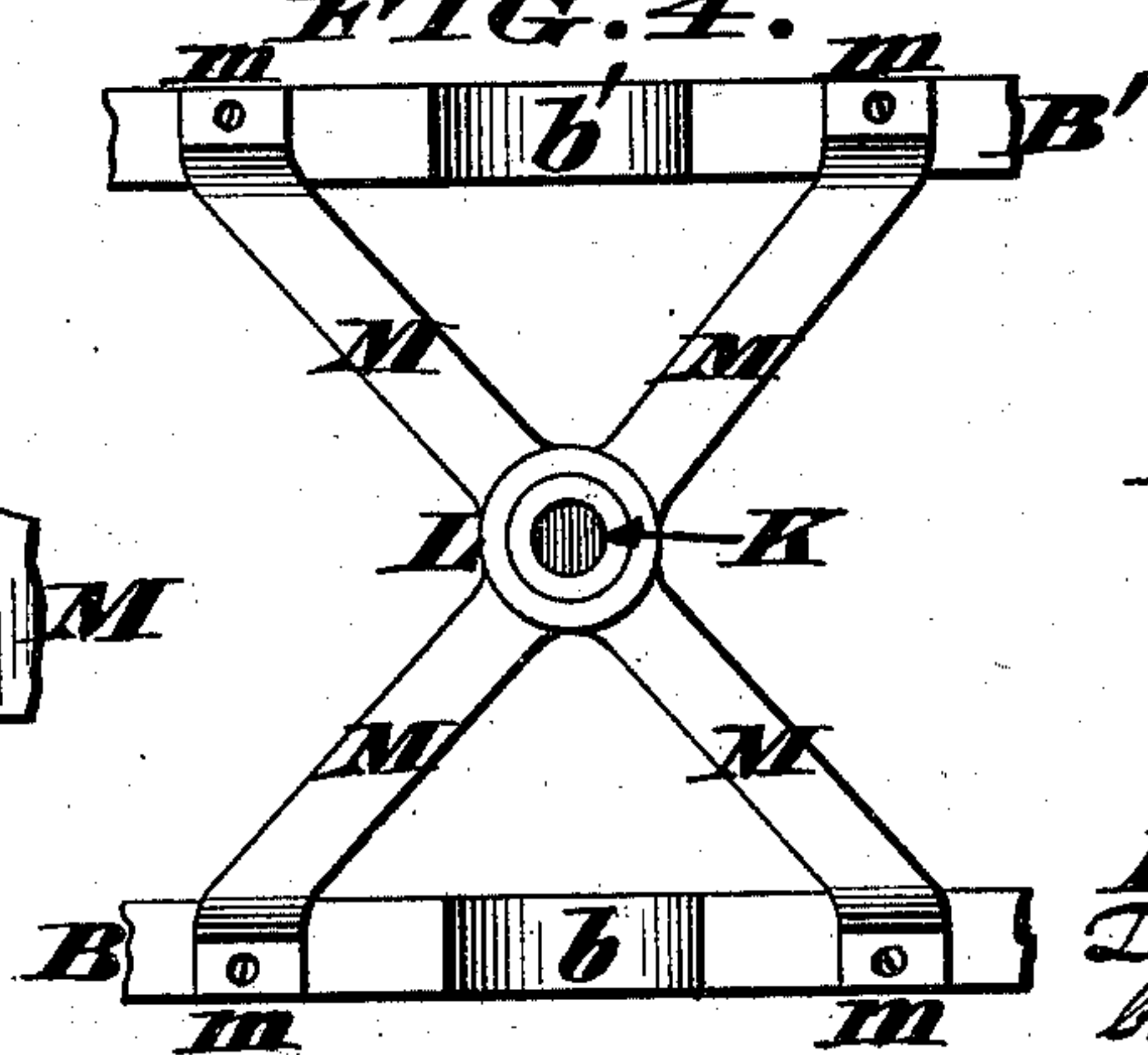
**FIG. 2.**



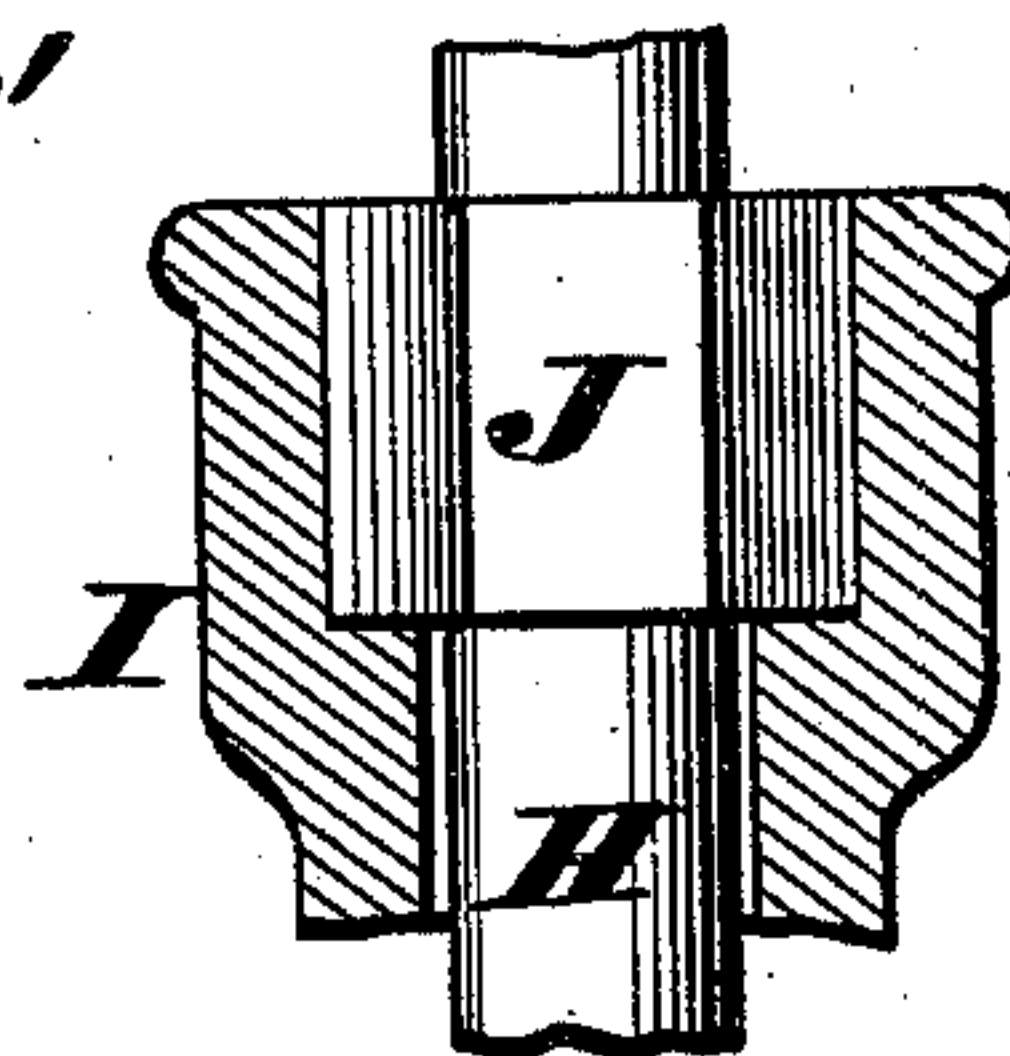
**FIG. 3.**



**FIG. 4.**



**FIG. 5.**



*Attest.*

Ida Heitz  
Arthur Moore.

*Inventor.*

*Inventor.*  
*Daniel G. Coppin.*  
*By James H. Layman.*  
*Atty.*



# UNITED STATES PATENT OFFICE.

DANIEL G. COPPIN, OF NEWPORT, KENTUCKY, ASSIGNOR TO THE BLYMYER  
IRON-WORKS COMPANY, OF CINCINNATI, OHIO.

## CANE-MILL.

SPECIFICATION forming part of Letters Patent No. 558,638, dated April 21, 1896.

Application filed August 19, 1895. Serial No. 559,748. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL G. COPPIN, a citizen of the United States, residing at Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Cane-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

This invention relates to those grinding-mills whose side plates or housings are slotted vertically to admit boxes within which are fitted the journals of an upper horizontal roll having at one end a bevel-wheel that gears with a similar wheel secured to a vertical driving-shaft; and my improvement comprises a novel construction of bridge-piece which carries a step or socket for said shaft to turn in. The bridge-piece is a stout casting adapted to span the upper roll, and has four arms radiating from a central hub, and each arm has at its outer end a flange adapted to be bolted to the side plates at a proper distance from their vertical slots. By this means an extended base is afforded for the bridge-piece, while at the same time unobstructed access is afforded to the journal-bearings for oiling and other purposes, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a vertical section of the upper portion of a grinding-mill embodying my improvement, said section being taken in the plane of the journal-bearings of the top roll. Fig. 2 is a side elevation of said mill, a pinion of said roll being omitted, its position indicated by a dotted circle, and the journal to which said pinion is secured being sectioned. Fig. 3 is an enlarged axial section of the socket or step fitted within the hub of the bridge-piece. Fig. 4 is a plan of said bridge and portions of the side plates or housings. Fig. 5 is an enlarged axial section of the upper part of a tubular standard that incloses the vertical shaft of the mill.

The main frame of my mill consists, essentially, of four corner posts or columns A and a pair of side plates or housings B B', the upper portions of said plates being slotted vertically at *b b'*, as more clearly seen in Fig. 4, to admit boxes or other bearings C C', within

which are journaled the gudgeons *d d'* of an upper horizontal roll D, a pinion E being secured to the gudgeon *d*, while a bevel-wheel F is attached to the other gudgeon *d'*. Pinion E drives a pair of lower rolls in the usual way; but the bevel-wheel F gears with a master-wheel G, secured horizontally to a vertical driving-shaft H, which shaft may be turned by any suitable means, but usually it has a sweep attached to it, in order that the mill may be operated by horses or their animal equivalents. The upper portion of this shaft H traverses a tubular standard I, the bore of which latter is slightly larger in diameter than said shaft, as more clearly seen in Fig. 5. Furthermore, the upper portion of standard I has a bushing J inserted within it, which bushing is made of any suitable antifriction metal, and is polygonal in horizontal section, so as not to be moved by the turning of shaft H.

Bushing J is simply bored out to fit snugly around said shaft, and then is dropped into a properly-shaped cavity in the upper end of the standard, no dressing or other fitting of these parts being necessary.

Standard I has four radial arms *i* secured to the pillars A of the main frame.

K is a socket or step fitted within the central boss or hub L of the bridge-piece previously referred to, the socket being also made of an antifriction metal, and having at its lower end a square or other non-circular lug *k*, as more clearly seen in Fig. 3. This lug fits into a similarly-shaped hole in the bottom of the hub L, and thereby prevents the socket K being turned around by the shaft H.

Radiating from the hub L are four arms M, the outer ends of which terminate with horizontal flanges *m*, capable of being bolted to the side plates B B', as more clearly seen in Fig. 4.

Reference to Fig. 1 shows that the bridge-piece L M *m* is sufficiently long to span the roll D, and that it is high enough to clear the latter, while Fig. 4 indicates that the bearings *m* of said bridge are somewhat remote from the slots *b b'* of the side plates B B'. Consequently this stout cast bridge-piece affords a firm steady bearing for the vertical driving-shaft H without obstructing the open upper ends of the slots *b b'*, and on this ac-



count the boxes or bearings C C' can be taken out at any time without disturbing other parts of the mill. Again, this spanning of the slots and roll by the bridge-piece affords the most convenient access to the roll, &c., either for cleaning or lubricating the same. Fig. 1 shows also that the master-wheel G is so located as not to touch any part of the mill-frame, nor to come in contact either with the bridge L M or standard-arms *i*. Therefore the only possible wear of said wheel is caused by the engagement of its teeth with those of the pinion F, and for this reason my mill will run true without requiring repeated adjustments. Finally, as the shaft H has but two bearings J K the friction of the mill is reduced to a minimum and the cost of manufacture is materially lessened.

I claim as my invention—

1. The combination, in a cane-mill, of a pair of housings having a set of rolls journaled therein, the upper one of which is provided with a bevel-gear; a bridge above said upper roll, and having its bearings secured to said housings; a master-wheel above said bridge and engaging with said bevel-gear, but out of contact with any part of the shaft-supports; a tubular standard above said wheel; and a driving-shaft journaled in said bridge and standard, and carrying said master-wheel, for the purpose described.

2. The combination, in a cane-mill, of a pair of housings B, B', having slots *b, b'*, open at their upper ends; a set of rolls journaled in said housings, the upper roll of which is provided with a bevel-gear F, a bridge M above said upper roll, and secured to said housings at four bearings *m*, a master-wheel

G above said bridge and engaging with said bevel-gear F, but out of contact with any part of the shaft-supports; a tubular standard I above said wheel; and a driving-shaft H journaled in said bridge and standard, and carrying said master-wheel G, for the purpose described.

3. The combination, in a cane-mill, of a pair of housings B, B', having slots *b, b'*, open at their upper ends; a set of rolls journaled in said housings, the upper roll of which is provided with a bevel-gear F; a bridge M above said upper roll, and secured to said housings at four bearings *m*; a non-rotatable step K, seated in said bridge; a master-wheel G above said bridge and engaging with said bevel-gear F, but out of contact with any part of the shaft-supports; a tubular standard I above said wheel; a non-rotatable bushing J fitted within said standard; and a driving-shaft H journaled in said step and bushing and carrying said master-wheel G, all as herein described.

4. The combination, in a cane-mill, of a set of rolls; a bevel-gear secured to the upper roll; a master-wheel engaging with said bevel-gear, but out of contact with any part of the shaft-supports; a vertical bearing above said wheel; a bridge below it; a step in the upper face of said bridge; and a driving-shaft journaled in said bearing and step, and carrying said master-wheel, in the manner described.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL G. COPPIN.

Witnesses:

JAMES H. LAYMAN,  
RICHARD BAHMANN.