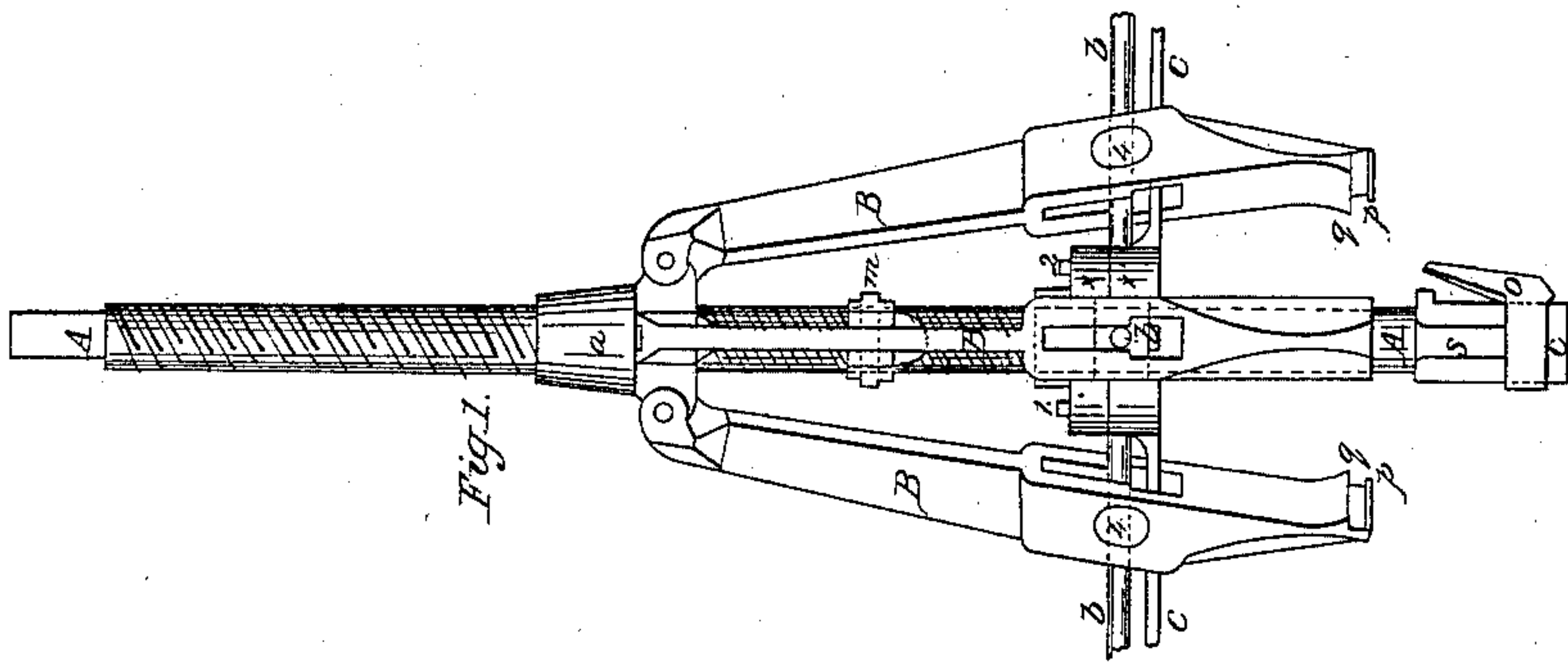
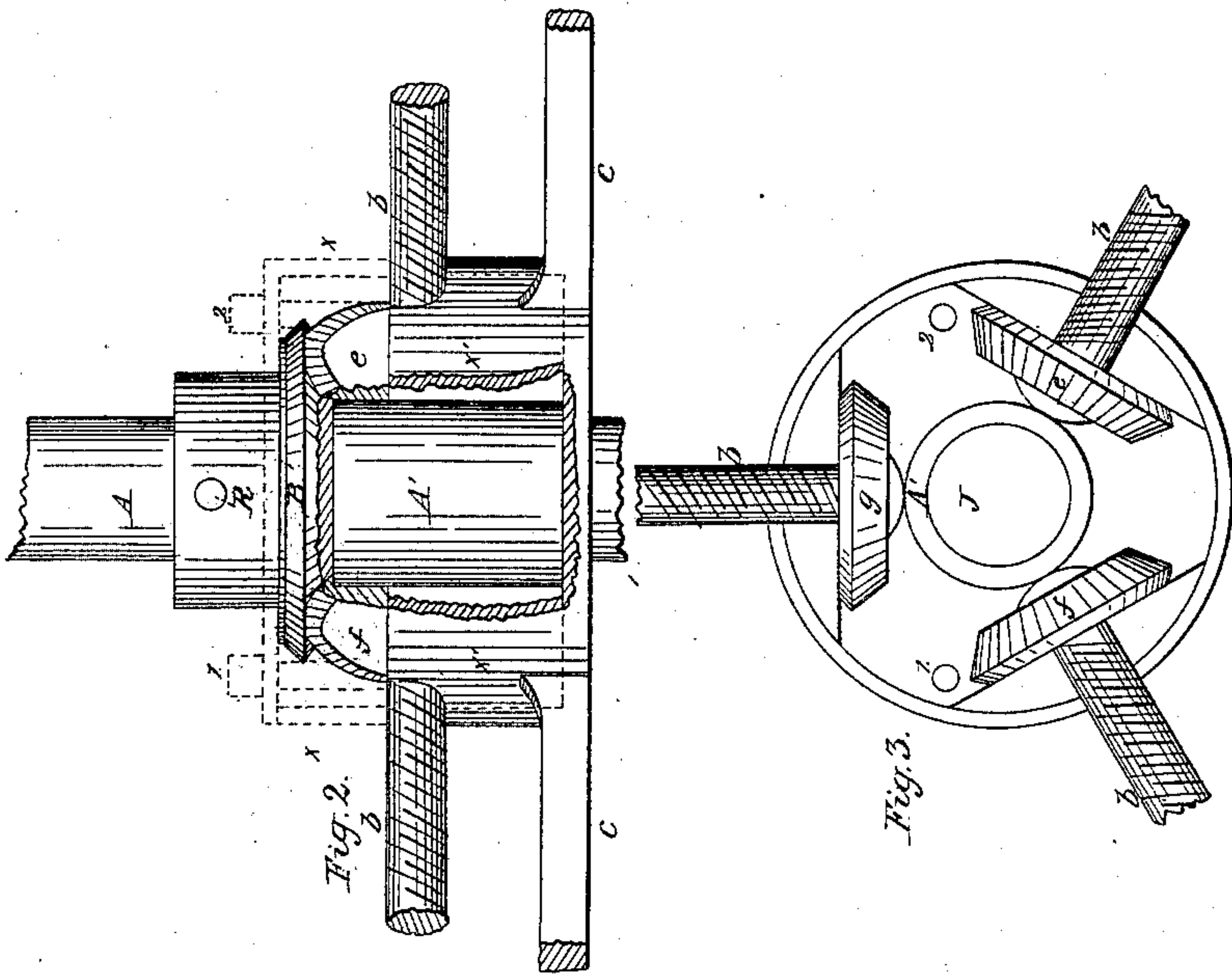


*T. Harper,
Boring Hubs.*

No 57,319.

Patented Aug. 21, 1866.



*Witnesses:
James J. Johnston
James M. Smith*

*Inventor:
Thomas Harper*

UNITED STATES PATENT OFFICE.

THOMAS HARPER, OF WEST MANCHESTER, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR BORING WAGON-HUBS.

Specification forming part of Letters Patent No. 57,319, dated August 21, 1866.

To all whom it may concern:

Be it known that I, THOMAS HARPER, of West Manchester, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hub-Boring Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in an improvement of the machine for boring out the hubs of wheels for which Isaac Munden received Letters Patent of the United States December 11, 1849.

The improvement herein described consists in incasing the gearing which is used for operating the screws which are used for expanding and contracting the clamping-jaws of said machine, and also in providing the master-wheel of said gearing with a suitable bearing, so that said master-wheel will always be held up and be prevented from sinking below the pitch-line of the teeth or cogs of the wheels into which it gears, the whole being constructed, arranged, and operating in the manner hereinafter described.

To enable others skilled in the art to make and use my improvement in connection with Isaac Munden's improved hub-boring machine, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 represents a front elevation of Isaac Munden's improved hub-boring machine furnished with my improvement. Fig. 2 represents a section of the same furnished with my improvement, a portion of the casing and master-wheel being broken away for the purpose of showing the bearing for said master-wheel. Fig. 3 represents a plan or top view of the casing and wheels which operate the screws used for expanding and contracting the clamping-jaws of the machine, and also represents a top view of the bearing for the master-wheel.

I do not propose giving a full and complete description in detail of the hub-boring machine, for such description may be found in the specification of the patent granted to Isaac Munden. I will therefore briefly describe said machine, so that the skillful mechanic will

clearly understand the nature and extent of my improvement.

In the drawings, A, Fig. 1, represents the mandrel. B represents three clamping-jaws, which are operated by screws *b*, which are operated by wheels *e*, *f*, and *g*, which are operated by the master-wheel B'.

The wheels *e*, *f*, *g*, and B' are incased in a box made in two parts, (marked X and X'.) This box or case is held in its proper place with relation to the other parts by means of three guides, (marked C,) which are placed directly under the screws *b*, and the two parts of the box or case X and X' are held together by means of two bolts, (marked 1 and 2.)

The screws *b* operate the clamping-jaws B through the medium of screw-nuts which turn on trunnions, so that they will allow the jaws B to be expanded and contracted to any desired angle without binding or cramping the action of the screws *b*.

At the lower end of the jaws B are shoulders *q* and gripes or teeth *p*, for the purpose of holding firm the hub while being bored. The shoulders *q* rest on the end of the hub, and the teeth *p* bite into the sides of the hub when the clamping-jaws are contracted or drawn in against the hub by the action of the screws *b*.

On the lower end of the mandrel A is a screw-pin, *s*, upon which is the cutter-holder *c*, in which is placed the cutter *o*, which can be adjusted to suit the size of the bore desired in the hub.

When I desire to bore out a hub I expand or contract the jaws B by turning the mandrel A, by means of a suitable handle, until the shoulders *q* rest on the end of the hub and the gripes or teeth *p* take a firm hold into the sides of it. I then adjust the gage-nut *m* to suit the depth of bore desired in the hub. I then remove the pin R, which will allow the mandrel to turn and operate the cutter *o* without operating the master-wheel B' and the wheels *e*, *f*, and *g*, into which it gears. After I have bored out the hub I draw up the mandrel and replace the pin R, which will again connect the mandrel with the master-wheel. I then unclamp the jaws off the hub by turning the mandrel backward, which will operate the master-wheel B', which will turn the wheels *e*, *f*, and *g* and the screws *b*, and there-

by expand the jaws B and relieve them from their hold on the hub. The work is then completed.

Now, the object of my invention is to obviate two very serious objections and difficulties in Isaac Munden's hub-boring machine—to wit, the clogging of the teeth or cogs of the wheels *e*, *f*, *g*, and B' by chips from borings of the hub and other dirt, and the rattling and uneven and unsteady action of the wheels, caused by the teeth or cogs of the master-wheel working below the pitch-line of its teeth and the pitch-line of the teeth or cogs of the wheels *e*, *f*, and *g*. I overcome the first of these objections by increasing the wheels and thereby protect them from the chips and dirt. The second objection is overcome by providing the bearing A' for the master-wheel to rest upon, thereby holding its teeth or cogs to their pitch-line and to the pitch-line of the teeth or cogs of the wheels *e*, *f*, and *g*, thereby preventing that uneven and unsteady action which was common to

Isaac Munden's machine prior to the use of the bearing A'.

The bearing A' is cast to the part marked X', and is furnished with an opening, J, through which passes the mandrel A. The upper end of the bearing A' is turned off smooth and true, and is fitted to the under side of the master-wheel B', and arranged in height so as to bring the cogs or teeth of the several wheels to their pitch-line.

Having thus described the nature, construction, and operation of my improvement, what I claim is—

The use of the bearing A' for the master-wheel B', said bearing and wheel being constructed, arranged, and operating with relation to the various parts as herein described, and for the purpose set forth.

THOMAS HARPER.

Witnesses:

JAMES J. JOHNSTON,
ALEXANDER HAYS.