To all to whom these Presents shall come I

William Bibby, of Castlemaine, in the Colony of Victoria, Engineer, send greeting.

Whereas I am desirous of obtaining Royal Letters Patent for securing unto me Her Majesty's special license that I my executors administrators and assigns and such others as I or they should at any time agree with and no others should and lawfully might from time to time and at all times during the term of fourteen years (to be computed from the day on which this instrument shall be left at the Office of the Registrar-General) make use exercise and vend within the Colony of Victoria and its dependencies an Invention for

"Improvements in direct-acting steam stamping machinery."

~~And in order to obtain the said Letters Patent I must by an Instrument in writing under my hand and seal~~ particularly describe and ascertain the nature of the said Invention and in what manner the same is to be performed and must also enter into the covenant hereinafter contained Now know ye that the nature of the said Invention and the manner in which the same is to be performed is particularly described and ascertained in and by the following statement (that is to say).

This invention consists of certain improvements in direct-acting steam stamping machinery by which an efficient economical and compact battery is produced.

The base of my machine consists of a stamper box on the top of which I fit a hollow cast iron column supporting the several cylinders and valves for operating the stampers as hereinafter described.

The stamper box is made of cast iron or cast and malleable iron as the case may be. The base of the box is of large area so as to give stability and firmness to the machine. The body of the box is made of sufficient height and width for the stampers (by preference two) to work in. A feed opening is made in the back of the box and four others are made in the lower part of it fitted with gratings for the discharge of the pulverized ore.

The cast iron column is secured to the top of the stamper box by means of bolts and nuts and has two openings in its base fitted with split bushes for the stamper shanks to work through. These bushes act as guides and keep the stampers in a vertical position when working. Inside the top of this column there are two stuffing boxes fitted. for packing for the stamper shanks to work through into the steam cylinder above. An opening is cast in each side of this column to admit of adjusting glands for the stuffing boxes and bushes. Between the two steam cylinders for the stamper shanks there are two other cylinders one above the other the underneath one being a pneumatic cylinder and the upper one an equilibrium steam valve cylinder. All these cylinders are cast in one piece and secured on the top of the column by bolts and nuts.

The stamper shanks are made hollow of either malleable iron or cast steel and the hollow part is filled with wood. The bottom end of each is made so as to receive the tang of a cast iron or steel

shoe and the top is fitted with a piston to work steam both in one of the cylinders before referred to.

The equilibrium cylindrical valve is for regulating the admission and exhaust of steam to and from the cylinders in which the stamper shanks work. A rod passes through this equilibrium valve projecting both from the top and the bottom. That part which projects from the bottom has a cup leather piston fitted on to its lower end which works into the pneumatic cylinder below. The object of this cylinder is to close the steam valve as soon as it ceases to be acted on by the stamper and by so doing cause the steam to be worked expansively. That part of the rod which projects from the other end of the equilibrium valve is connected at its extremity with a weigh bar which is supported in its position by two pillars connected to the flanges of the steam cylinder. Connected to each end of weigh bar is a rod passing through a stuffing box into one of the stamper shank steam cylinders. These rods can be lengthened or shortened ~~as pleasure~~ so as to regulate the expansion of the steam and so adjust the force of the blow delivered by stampers as may be required. There is a recess in the end of these rods in which a piece of hard wood is inserted to neutralize the jar of the pistons when coming in contact with them.

Connected to the lower end of each steam cylinder there is a pipe fitted with stop cock, and leading to the boiler for the purpose of preserving and regulating a constant pressure on the under side of the pistons on the stamper shanks which are made of only just sufficient area to enable the stampers to be raised freely at a given pressure. The force of the blow delivered by each stamper will be regulated by the difference between the area of the top and that of the bottom sides of the pistons and the pressure of the steam applied.

Start

In order however that my invention may be distinctly understood I will proceed to describe the drawings hereunto annexed which clearly illustrate the nature of my invention. Figure 1 shows front sectional elevation and Figure 2, side elevation partly in section of a battery constructed according to my invention. A is the stamper box and B the feed opening therein and C the grating; D is cast iron column and E E are the bolts and nuts for securing it to the top of stamper box; F F are the split bushes; G G, stuffing boxes; H H, adjusting glands; I I, hollow stamper shanks filled with wood I', and having piston I^2 at the top; J J are annular steam spaces in steam cylinders J'; K is the equilibrium cylindrical valve working in cylinder K'; L L are passages for steam into steam cylinders J' above the pistons on the stamper shanks; K^2 is the upper portion of a rod, and K^3 the lower portion of a rod which passes through the equilibrium valve K; K^4 is cup leather piston working in pneumatic cylinder M; K^5 are air holes; N is weigh bar; O O, pillars; P, rods.

The action of the machine is as follows:- Steam is admitted from a boiler, not shewn in the drawings, to one of the steam spaces J so as to act upon the under side of the piston I^2 at the top of one of the

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stamper shanks I and raise it until and after it comes into contact with one of the rods P which it presses upwards until one of the ports to one of the steam passages L is opened by its action upon the weigh bar and through it upon the rod K^2 and equilibrium cylindrical valve K. The steam then rushes through this passage into the upper part of one of the steam cylinders J and acting upon the larger surface of the piston on the top of the stamper shank overcomes the small pressure of the steam underneath and forces it downwards with the necessary violence to enable the stamper to crush the stone. Simultaneously with the opening of the port to the one steam passage that to the other is closed and its exhaust port opened so as to produce an alternate motion in the stampers.

Having thus described the nature of my invention and the manner of performing same, I would have it understood that I do not confine myself to precise details so long as the nature of my invention be retained, but

I claim:—

~~First~~ 1. The peculiar construction and arrangement of the stamper box column and cylinders whereby I produce an efficient economical and compact machine for stamping by the direct action of steam.

~~Second~~ 2. The application of a constant pressure to the under side of the piston on the stamper shank for the purpose of raising it substantially as herein described and explained.

~~Third~~ 3. The construction and use (separately and in combination) of the equilibrium valve K and cylinder K^1, the rods K^2 and K^3, the cup leather piston K^4, and pneumatic cylinder M, and the weigh bar N and rods P, in the manner and for the respective purposes substantially as herein described and explained.

~~Fourth~~ 4. The construction and use (separately and in combination) of the hollow stamper shanks I with wood cores I^1 and pistons I^2, and of the split bushes F in the manner and for the respective purposes substantially as herein described and explained.

And I do hereby for myself my heirs executors and administrators covenant with Her Majesty her heirs and successors that I believe the said Invention to be a new invention as to the public use and exercise thereof and that I do not know or believe that any other person than myself is the true and first Inventor of the said Invention and that I will not deposit these presents at the Office of the Registrar-General with any such knowledge or belief as last aforesaid. once

In witness whereof I the said William Bibby have hereto set my hand and seal this twenty fourth day of January One thousand eight hundred and seventy four.

William Bibby

24th January, 1874.

The Letters patent were granted in this case

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No 1873
Specification 2 Sheets
Drawings 2 "
Deposited the 24th of January 1874
at the Patent office
Registrar General's Department

Wm Bibby's Patent.

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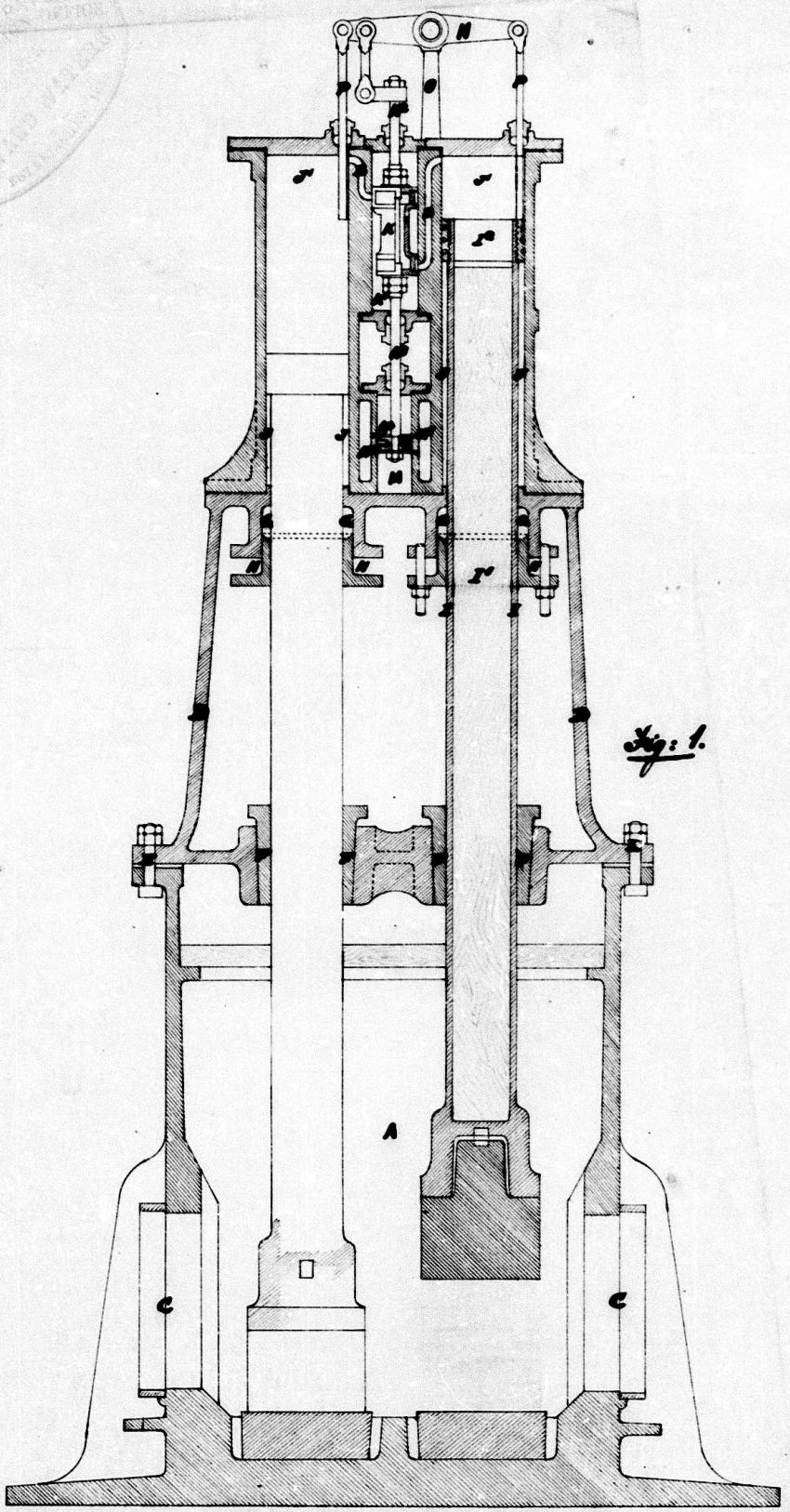

Fig: 1.

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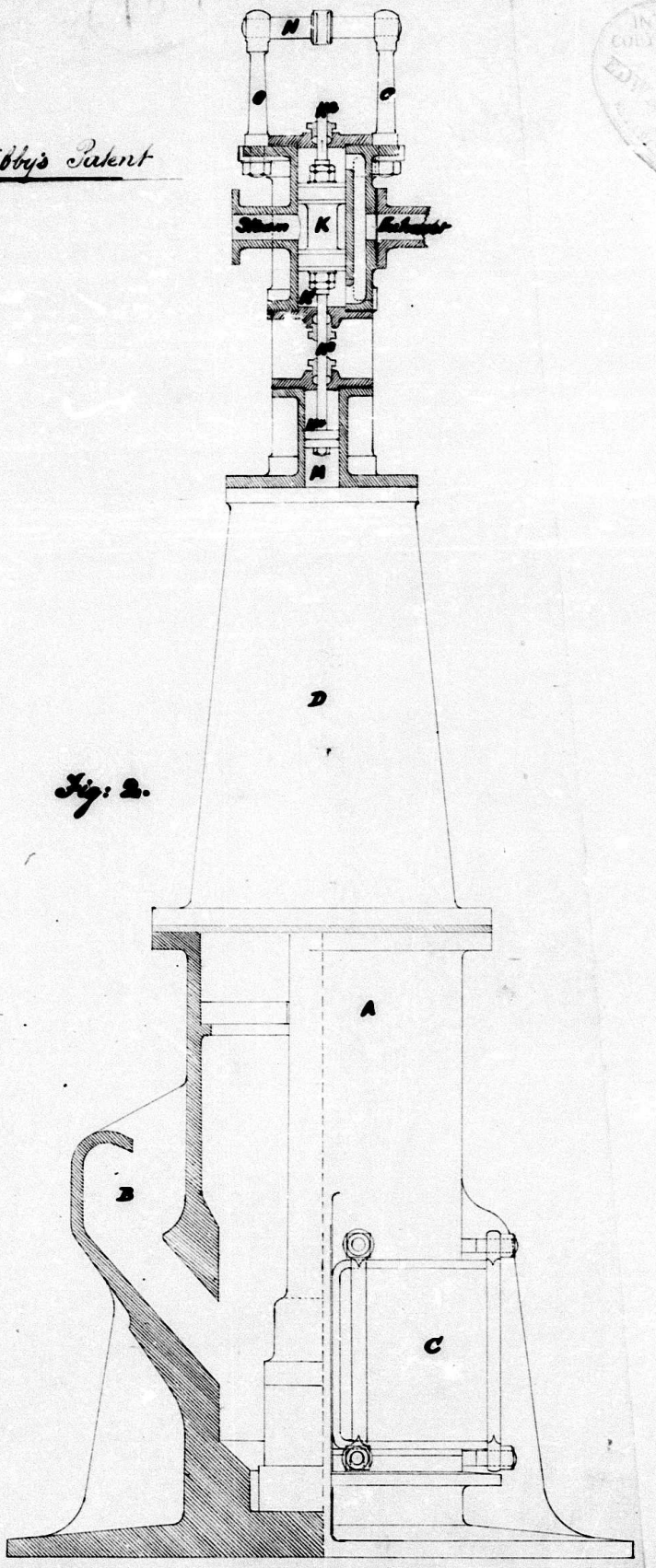

Fig: 2.