H. Baines.

Metal-Rolling Machine

No. 60,322. Patented Dec. 11, 1860.

Fig. 1.

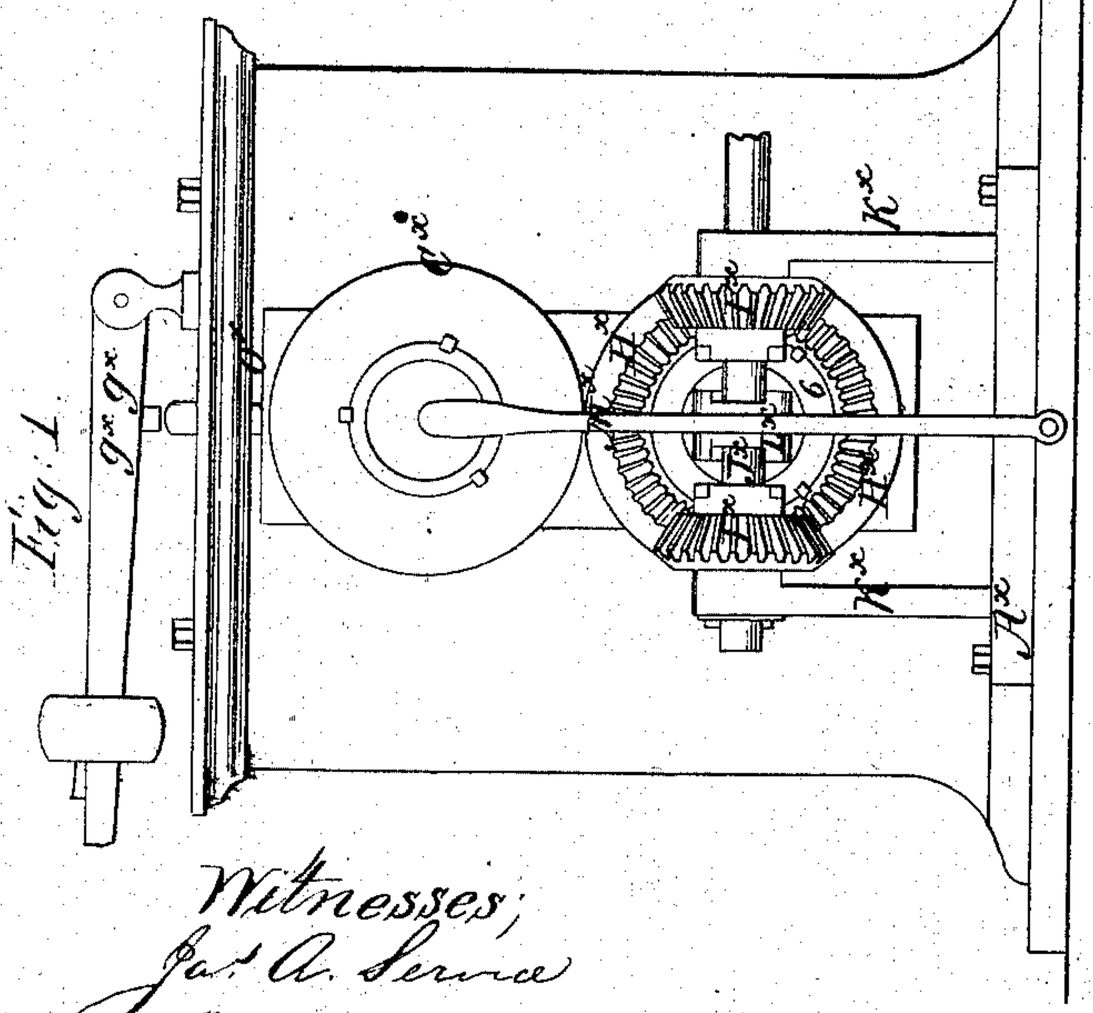


Fig. 2.

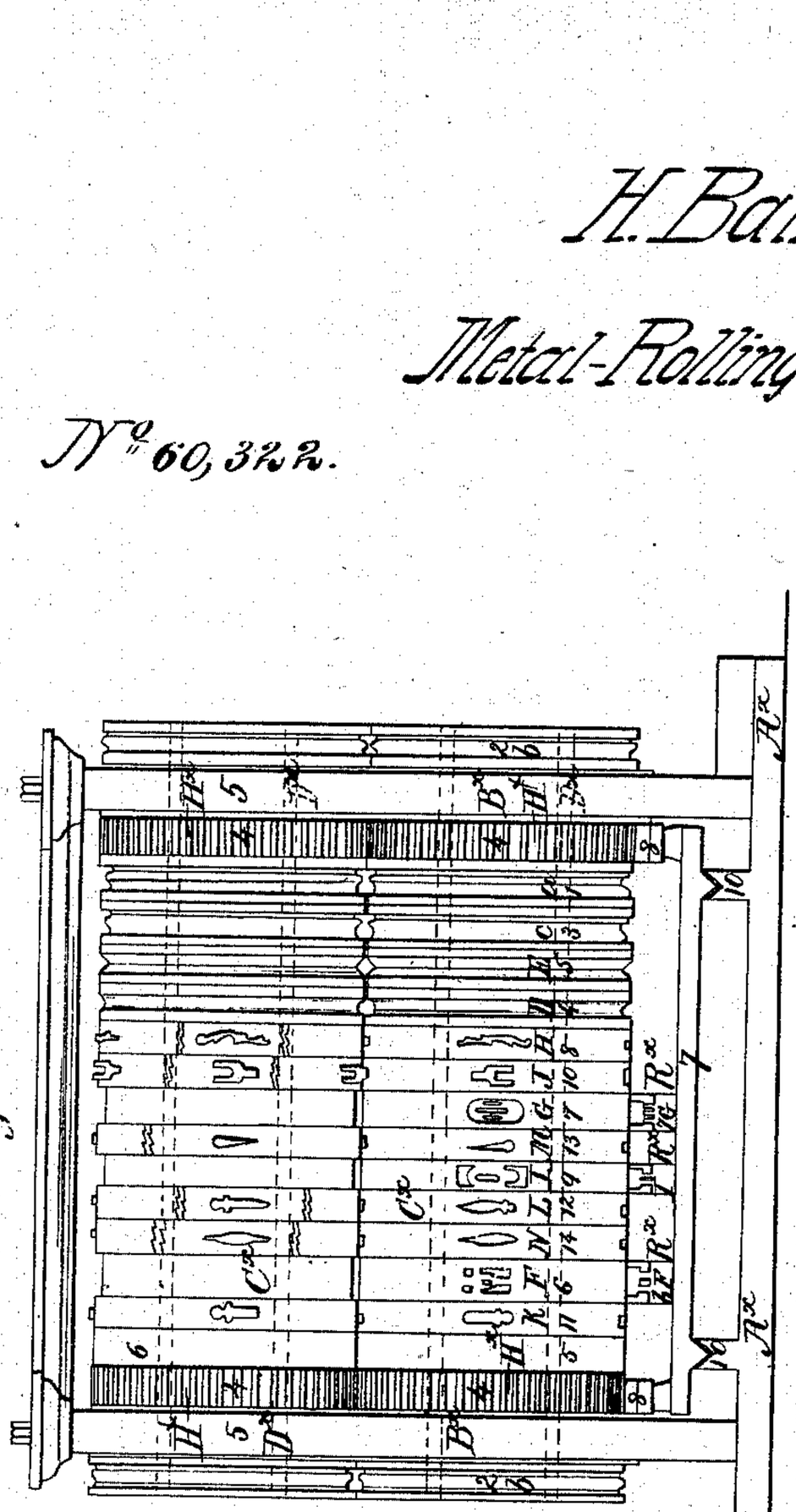
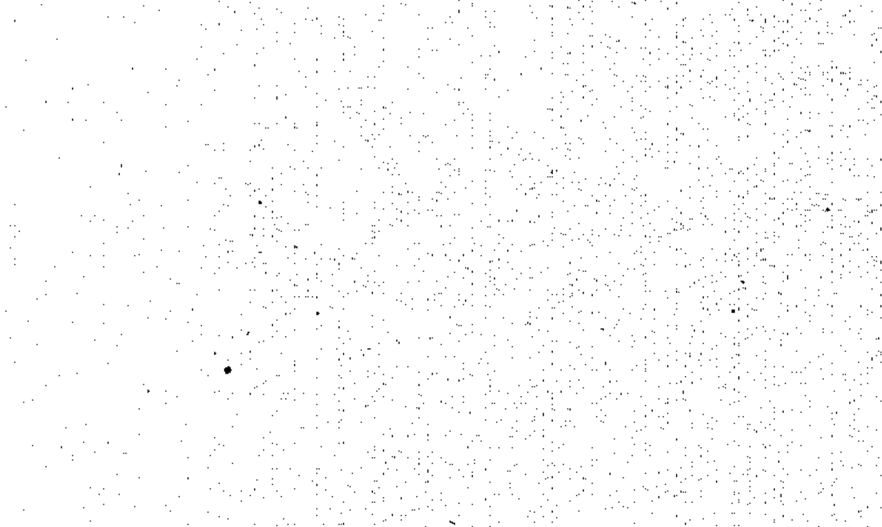


Fig. 3.



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IMPROVEMENTS IN MACHINES FOR ROLLING METAL.

HUGH BAINES, OF MANCHESTER, ENGLAND.

Letters Patent No. 60,322, *dated December* 11, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, HUGH BAINES, of Manchester city, in the county of Lancashire, and Kingdom of England, have invented new and useful Improvements in Forge Rolling Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The machine embraced in the present invention consists of a perforated movable table, and two or more hollow and perforated rollers, having sectional perforated and engraved rings fitting around the same. These rings are made so as to be easily removed and changed to forge and roll different kinds of work, according to the patterns engraved, cast, or otherwise properly secured upon the rings. The rollers and table are supported by a strong and suitable frame, and worked by reversible gearing or straps for the same purpose. In order to have the rollers made light, I attach levers and weights, to give the requisite pressure.

In the accompanying plate of drawings my improvements in forge rolling machines are illustrated:

Figure 1 being a partial end elevation and vertical section.

Figure 2, a front elevation of rollers, showing end of movable table; and

Figure 3, a plan or top view of movable table.

Similar letters of reference indicate like parts.

A× A×, in the drawings, represent the bed or foundation plate of the machine, having parallel uprights B× B×, between which two rollers, C× C×, are placed; the one above the other, and each turning in suitable blocks or bosses D×, arranged in the upright B×. Both rollers, C× C×, are made hollow through their entire length, from end to end, H× H× gear-wheels at each end of rollers C×, upon the inside of the uprights B×, the gear-wheels at the same end of each roller interlocking with each other. These gear-wheels H× H× are keyed to the rollers so as to turn in conjunction therewith, but yet allow of their easy detachment from the same. On the rollers C× C×, between their gear-wheels, at each end, is keyed a series of concentric rings, as plainly shown in fig. 2 of the drawings; which rings are respectively numbered 1, 3, 5, 4, 8, 10, 7, 13, 9, 12, 14, 6, 11, from right to left, and respectively lettered *a*, *c*, E, D, H, J, G, M, I, L, N, F, K. On each end of both rollers C×, outside of uprights B× B×, is secured a roller, numbered 2 and lettered *b* in the drawings. Fig. 2, and at the extreme left hand end of each roller C×, between the upright B×, is secured a ring, numbered in the upper roller 6, and in the lower 5. 7, a table arranged upon and moving in parallel guideways 10 of the bed-plate A×, between it and the lower roller of the rollers C×. This table 7 extends across the bed-plate A×, and along its edges or sides are raised toothed racks 8, which engage with the gear-wheel secured to the lower roller C×, so that, as said roller is revolved, the table will be moved across the bed-plate under the same, in either one or the other direction, according to that in which the roller is turned. Upon one end of the lower roller C×, outside of the upright B×, at such end, is keyed a bevel gear-wheel H×, with which, upon each side, engage small bevel gear-wheels I×, loosely hung upon a common horizontal shaft J×, turning in suitable bearings of the uprights K×, secured to the bed-plate A. On this shaft J×, between the two loose gear-wheels H×, is hung a sliding clutch L×, by pin and slot, or in any other suitable manner that will allow it to be slid or moved laterally upon the shaft, and yet turn with it. To this clutch L× is connected a lever handle M× for convenience in moving it, and thus to throw it into connection with either one of the two loose gear-wheels upon the shaft J×, according to the direction in which it is desired the rollers should turn; the driving power used being connected to this shaft in any suitable manner. To the upper side of each of the uprights B× is hung a weighted lever *g*× *g*×, that rests through a pin O× upon the journal box or boss of the upper collar C×; the object of which weighted levers is to hold the upper roller firmly down to its work; the weight upon each lever being susceptible of adjustment according to the amount of pressure desired. To the movable table in line with the rings of the lower roller, lettered and numbered F, I, and G, are fixed die-plates R× R×, which, in connection with the rings above mentioned corresponding thereto in position, are used for the manufacture of railroad couplings and links, the rollers and dies being suitably formed to produce the same as the iron passes in and between them. The rings of the rollers marked *a*, 1, are for the making of the first half of railroad point; the rings

B, 2, upon the outer ends of each of the rollers for repairing rails; the rings C, 3, for making railroad tongue or crossing points for "Dramond crossings;" the rings D and E, 4 and 5, for rolling scrap iron and bringing same into suitable sizes; the rings H, 8, for making latches to secure nuts on bolts of fish-plate railroad iron from turning; the ring I, 9, for making joints; the rings 11 and 12, K and L, for making railroad coupling pins; the rings M, 13, for making nails; and N, 14, for preparing iron for ordinary hooks.

In the operation of my improved rolling machine, hereinabove described, a furnace for the heating of the iron should be provided, of sufficient length to receive railroad rails, in which they are first to be heated to a welding heat, when they are to be run through the rollers 5 and 6, as before described. By these means a perfect rail can be formed, and an old rail rerolled, but slightly reduced in weight, without cutting it up, and smelting it, as is now done. In cases where rails require to be kept the same size, or made longer, I heat the rail, as also a piece of iron. This being done, the said piece is then tacked to the rail and welded by the rollers; and in like manner I repair the ends or centre, or any part of an old rail.

From the above description of my invention, and the manner in which I manufacture, it will be readily seen that when iron is heated and applied to the rollers or table, they being in motion, and the iron drawn in it, will be necessarily forged to the patterns on the rings and on the table.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

1. The combination of the hollow perforated rollers C× with the reversible gearing H× I×, when constructed, arranged, and connected together, so as to operate substantially in the manner described, and for the purposes set forth.

2. In combination with the above, the movable table 7, arranged and operating substantially as and for the purpose specified.

The above specification of my invention signed by me this 22d day of May, 1866.

HUGH BAINES.

Witnesses:

THOS E. LOCKIE.

JNO. STARK.