1938X

T. Bruff,

Shot Machine,

Patented June 4, 1813.

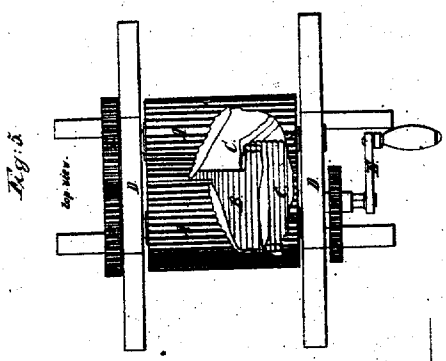


Fig. 3.
top view.

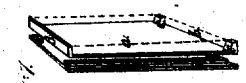


Fig. 7.

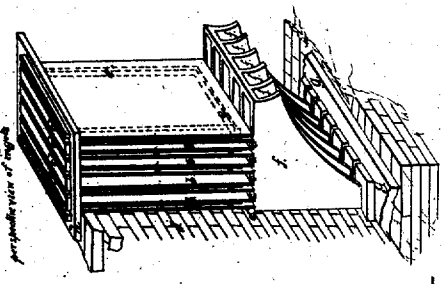


Fig. 6.
perspective view of mould.

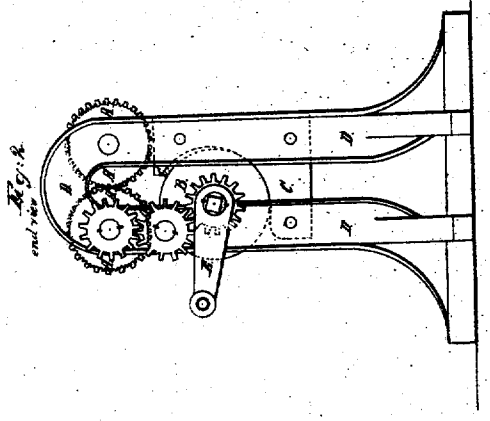
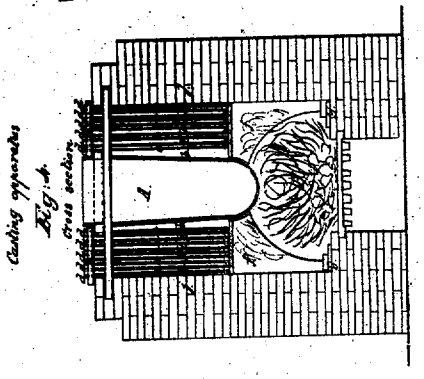


Fig. 2.
end view.



Casting apparatus
Fig. 4.
cross section

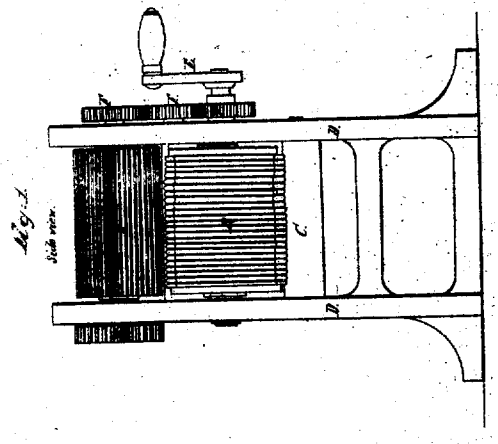


Fig. 1.
side view.

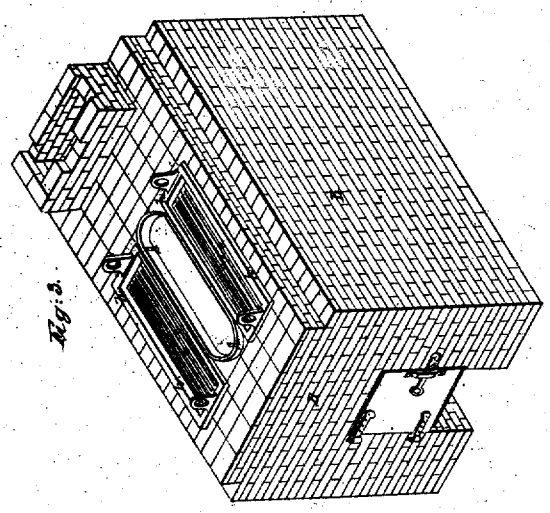


Fig. 5.

June 4 1813 1938x 23

Thomas Ruff

Letters Patent

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Thomas Ruff himself of his machine for making Shot &c. by pressure

This machine for making pressed shot from flat bars of lead consists of two slitting and one pressing roller which all curve all of them, case hardened iron, or hard brass, in a frame of metal. The slitting rollers are placed horizontally at the top, are grooved lengthwise with almost half circular grooves, a little widened at the top to let the lead pass freely from them to the pressing part beneath. The grooves in each roller are exactly alike and facing each other all round, so as to slit the bars cross wise almost as round as wire. Between the grooves a plain space is left about the width of a small pin head where the lead between the wires is compressed to the size of thin paper for the purpose of holding the pieces together till it conducts them to the mouth of the pressing Roller and curve. The pressing Roller should be about a third larger than the slitting rollers, and placed with the top or mouth of the curve immediately under the dividing line between them, to receive the slitted bar as it comes from them. This roller is grooved round its circumference in perfect half circular grooves, so near each other as to bring the metal almost to an edge between, and as many in number as will compress the width of the bar making them about a fifth wider than the groove of the slitting rollers, to allow for the increase of diameter of the shot as they are formed. On one side of the pressing roller is the curve grooved like the roller with the grooves facing each other. It is fixed to the frame and follows the circle of the roller except a gradual widening from near the middle to the top, leaving a space between at top sufficient to receive one piece of the slitted bar as they

come from the Milling rollers. The length of the curve must be
proportion to the size of the shot to be made by it, which to mak
them perfectly round must be rolled over twice between the rol
and curve after it leaves the diverging and dividing part at
the top and the curve should be gradually turned a little out
at bottom, to give the shot an easy delivery from the groove

The Milling rollers have small cogs on one end to make th
keep pace with each other, and on the other end of one of them
and on one end of the pressing roller are two other cogs of eq
size, and when force is applied to the handle of the pressing r
they all move together, and the pressing roller moves one third fas
than the Milling rollers in consequence of its greater diameter
gives room for the pieces to move clear of each other. When the
Milling is performed by the upper rollers, and the bar suspen
from them by the thin plate between the Milled pieces to the n
of the pressing pair the motion of the pressing roller draws them
into the mouth of the curve, takes them off one by one, divi
and rounds them into perfect shot and rolls them out at
the bottom of the machine. The casting apparatus consi
of iron ingots and a caldron set over a furnace for melting l
lead, and heating hauling the ingots at the same time. The num
of ingots will depend on the number of bars to be cast at a m
they should be from two to two and a half feet in length, may
made of any width with divisions the exact breadth of the ba
intended to be cast. The breadth of the bars must correspond with
the length of the grooves in the Milling rollers and their thickness
the diameter of the shot intended to be made from them.

The ingots are made in two flat plates one of them plain exc
a moulding at the top and back at bottom to keep the ot
one at a proper distance from it, the other like it, except a g
section on the inside of the side and bottom the thickness of the b
and about half an inch from the edges to admit of forming

ruled in between them with the finger, to keep them perfectly legible. The moulding on the top and Rack on the bottom, outside of the ingots must be about half an inch deep to keep them fast enough allowing to admit the heat from the fire of the furnace to pass free ly between them that they may be heated to the top. the tops must be squared and leveled to form an even surface when set in their frame. They are set perpendicularly on one or both sides of the caldron, their bottoms resting on arches of cast iron or irons, pointing towards the caldron with their feet on flat cast iron plates, placed horizontally with the bottom of the furnace. the upper edges of these arches thought that the ingots may stand perfectly level on them, the ingots are inclosed in a light iron frame at top. and the wall of the furnace on the outside and ends. If the dipping ladle and shanks are used, the top of the caldron may be almost level with the tops of the ingots and the bars when drawn may be trimmed to the proper in a gauge box with a cutter like a draw knife working on it. When draws are necessary for nice work they may be of cast iron or brass. and large enough to cover all the ingots on one side of the Caldron or in convenient divisions each draw consists of a flat plate to rest on the tops of the ingots having holes pierced in them corresponding in size and form with the open tops of the ingots and directly over them. they must have a high edging around them to keep in the superfluous lead, the lead to be discharged from a spout or cock over each draw. and when the ingots are charged, the draw must be moved forward a little more than the breadth of the holes and left to cool. | To use this machine it is only necessary when a moderate fence is applied to seal the end of a bar made as above directed, into the mouth of the conduct or at top and you have nothing to do but to receive the shot into a bag or box at bottom. By adding a wooden frame with a sloping bottom towards the conducting groove. You may place almost any number of bars reclining against the grind and

they will succeed each time in forming the combustion and will
worked with shot in succession. To give the shot a high
nish, the method used in the shot factory is sufficient,
turn them gently in a large iron cylinder, about two
ules with a little powder of black lead

Witnesses
(William Horniton)
Geo. Lyon

Thos. Bruff.

Drawing Medy
N.M.S.

(Blanket 4th June 1813)

(1250 words)

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