(No Model.)

J. W. SUMMERS & T. SHARP.

APPARATUS FOR COMPRESSING SCRAP METAL.

No. 400,415. Patented Mar. 26, 1889.

Fig. 1.

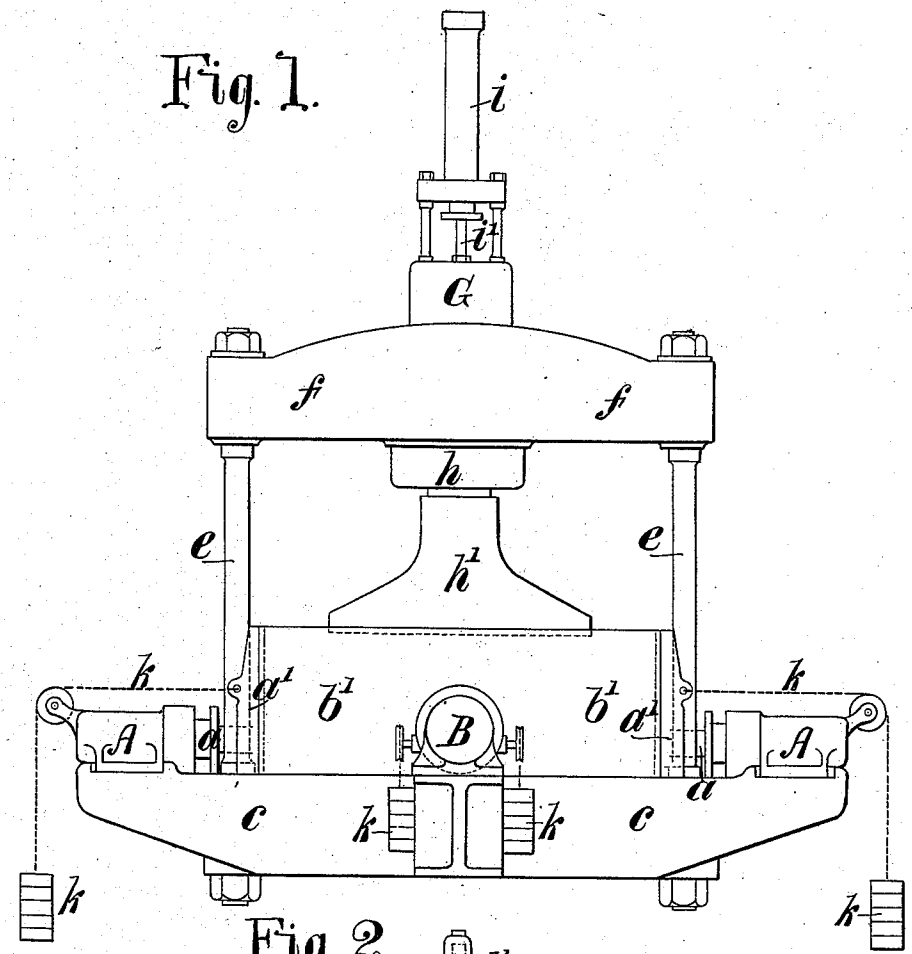
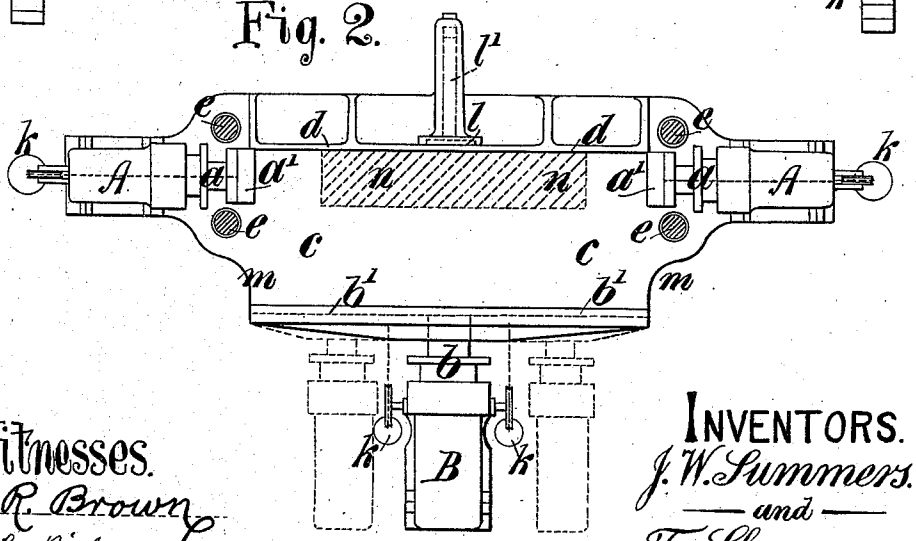


Fig. 2.



Witnesses.
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— and —
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UNITED STATES PATENT OFFICE.

JAMES W. SUMMERS AND TREVELYAN SHARP, OF STALYBRIDGE, COUNTY OF LANCASTER, ENGLAND.

APPARATUS FOR COMPRESSING SCRAP METAL.

SPECIFICATION forming part of Letters Patent No. 400,415, dated March 26, 1889.

Application filed December 6, 1888. Serial No. 292,799. (No model.) Patented in England September 1, 1888, No. 12,598.

To all whom it may concern:

Be it known that we, JAMES WOOLLEY SUMMERS and TREVELYAN SHARP, subjects of the Queen of Great Britain and Ireland, of Stalybridge, in the county of Lancaster, England, have invented certain Improvements in Apparatus for Compressing Scrap Metal into Blocks or Slabs, (for which we have obtained a patent in Great Britain, No. 12,598, dated September 1, 1888,) of which the following is a specification.

Our invention relates to apparatus adapted to be employed in compressing or condensing scrap metal into blocks which can be heated and rolled into plates or bars. We employ four hydraulic rams, three acting horizontally, the fourth being arranged to press downward upon the mass consisting of scrap which has been compressed into a smaller compass by the three horizontal rams.

In order that our invention may be clearly understood, we will describe the same more fully with reference to the accompanying drawings.

Figure 1 is a front elevation of the machine. Fig. 2 is a plan of the machine.

In the said figures, *a a* are two rams, which work in the hydraulic cylinders A A and move on the same horizontal plane toward and from each other. A third ram, *b*, works in the hydraulic cylinder B and moves on a horizontal line at right angles with the line of movement of the two rams *a a*. The three cylinders A A and B are firmly mounted and keyed or secured upon and to a strong cast-iron foundation-bed, *c*. The upper surface of this bed forms the floor of the machine and receives the scrap which is to be operated upon. Each of the rams *a a* is provided with a rectangular head or follower, *a'*, which slides upon the bed *c* when the rams are worked in or out. The third ram, *b*, is also provided with a head, *b'*, which corresponds in height with the heads *a'*, but is much longer.

On the opposite side of the machine is a strong upright metal wall, *d*, which is cast in one piece with the bed, or is firmly bolted, keyed, or secured to the same, as preferred. The vertical face of this wall is parallel with the vertical face of the head *b'* and corresponds in height with the same. When the heads *a'* slide toward or from each other, the vertical sides which are next to the face of the said wall move in sliding contact with the face of the said wall, or may clear the same to a suitable extent. If preferred, the upper surface of the bed and the faces, edges, or other parts of the heads and wall may be planed. It will be seen that when the head *b'* is pushed close up to the heads *a'* the three heads, the wall *d*, and the bed constitute a rectangular box, which is open at the top. To the bed *c* are firmly secured four strong columns, *e*, which carry a press cross-head, *f*. Seated in this cross-head is a fourth hydraulic cylinder, G, in which works a ram, *h*, of larger diameter than any of the other three. The lower end of this ram is provided with a head or follower, *h'*, which is of about the same width on the face as each of the two heads *a'*. One side of this head moves in sliding contact with or in close proximity to the wall *d*, as in the cases of the heads *a'*.

Suitable pipes and connections are provided for connecting the several ram-cylinders with an accumulator or with hydraulic pumps, or with both; but it has not been considered necessary to show such parts in the drawings. A small hydraulic cylinder, *i*, is mounted above the cylinder G, and within the said cylinder *i* is a piston, which is connected by means of a piston-rod, *i'*, with the upper end of the ram *h'*. By admitting hydraulic pressure below the said piston the ram *h* is raised after each operation. In the example the rams *a* and *b* are arranged to be drawn back by means of weights and chains *k k*; but, if preferred, they might be drawn back by hydraulic pressure. In the cases of any of the rams the ram might have a piston-head, so that the ram could be drawn back by admitting the pressure into an annular space on the front of such piston-head. The head *l* of a small ram which works in a cylinder, *l'*, is seated in a recess in the lower part of the center of the wall *d*, so that when the ram is withdrawn into the cylinder the face of the said head is flush with the wall *d*, and practically constitutes a part of the same. The use of this ram and head will be explained hereinafter.

The machine is intended to be used in manner as follows: When the parts are in the positions indicated in the drawings, the scrap to be compressed is placed upon the bed *c* within the space, which is inclosed on four sides by the parts *a'*, *d*, and *b'*, with the exception of the two end openings at *m m*, between the heads *a'* and the two ends of the head *b'*. The said space is filled completely, or to a desirable extent with the scrap. The ram *b* is then pumped or forced toward the wall *d* until it touches or nearly touches the two heads *a'* and the front edge of the head *h'*, thus compressing the scrap into a smaller space. The two rams *a'* are then forced toward the ends of the head *h'* until they are in contact with it, or nearly so. The scrap will then have been compressed into the space indicated by the dotted rectangle *n*. The large ram *h'* is then forced down as far as it will go, whereby the mass of scrap is still further compressed and converted into the form of a slab. (Indicated by *n*.) The rams having been withdrawn, the head *l* is forced forward and pushes the slab from below the head *h'*, so that the slab can readily be withdrawn through one of the aforesaid end openings *m*. The slab may be heated and rolled, hammered, or treated to convert it into bars, rods, or sheets, as required. If not considered to be necessary, the parts *l* and *l'* may be dispensed with. If preferred, the said end openings, *m m*, may be closed by means of vertical walls or of hinged or movable doors, which or one of which might be opened for the removal of the slab; or one or each of the cylinders A might be mounted so that it could be turned out of the way for the removal of the slab. By means of our improved machine wire, hoop-iron, scrap sheet, and other scrap hitherto almost valueless can be converted into slabs, which furnish iron of first-class quality.

Having described our invention, we declare that what we claim as being new is—

1. In a metal-scrap-compressing machine, the combination of the three horizontal hydraulic rams and ram-heads, with a third vertically-acting ram and head, which is forced downward to give the final pressure, substantially as set forth.

2. The combination of the two horizontal hydraulic rams *a a*, the third horizontal ram, *b*, the fourth vertical and downward acting ram, *h*, the solid-surfaced bed *c*, and the strong vertical wall *d*, substantially as and for the purpose set forth.

3. In a metal-scrap-compressing machine, the horizontally-acting hydraulic ram, in combination with the vertically downward-acting hydraulic ram provided with a hydraulic piston working in a cylinder, *i*, for raising the last-named ram after each pressure, substantially as set forth.

4. In a metal-scrap-compressing machine, the combination of horizontal hydraulic rams with a vertically-acting ram or pair or set of rams, a vertical wall, *d*, opposite one of the horizontal rams, and a discharging-ram situated in said wall, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

J. W. SUMMERS.
TREVELYAN SHARP.

Witnesses:
W. H. VAUDREY,
FREDK. DILLON.