No. 631,481. Patented Aug. 22, 1899.

F. W. WESNER.

FORGING MACHINE.

(Application filed Mar. 13, 1899.)

(No Model.) 3 Sheets—Sheet 1.

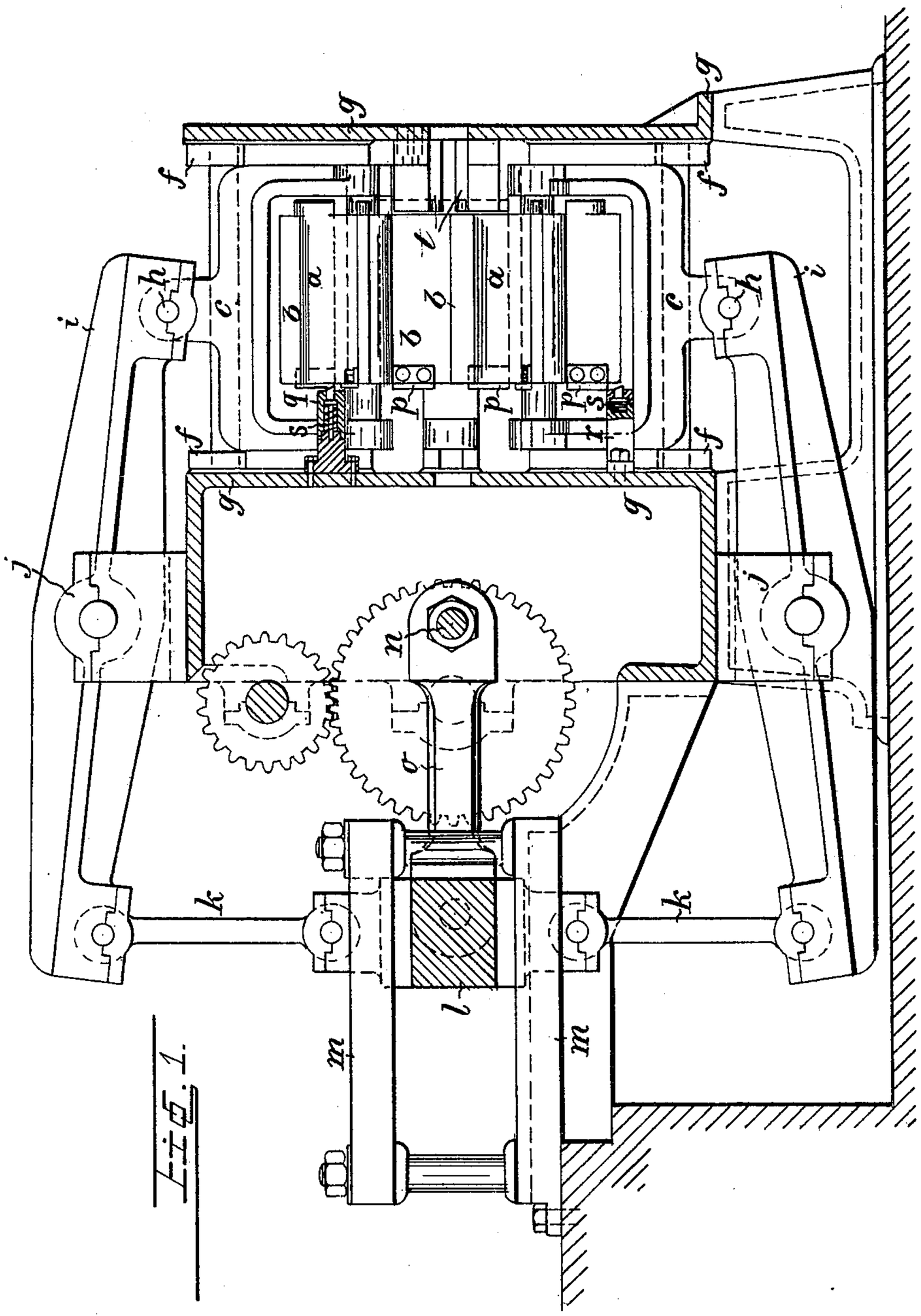

Fig. 1.

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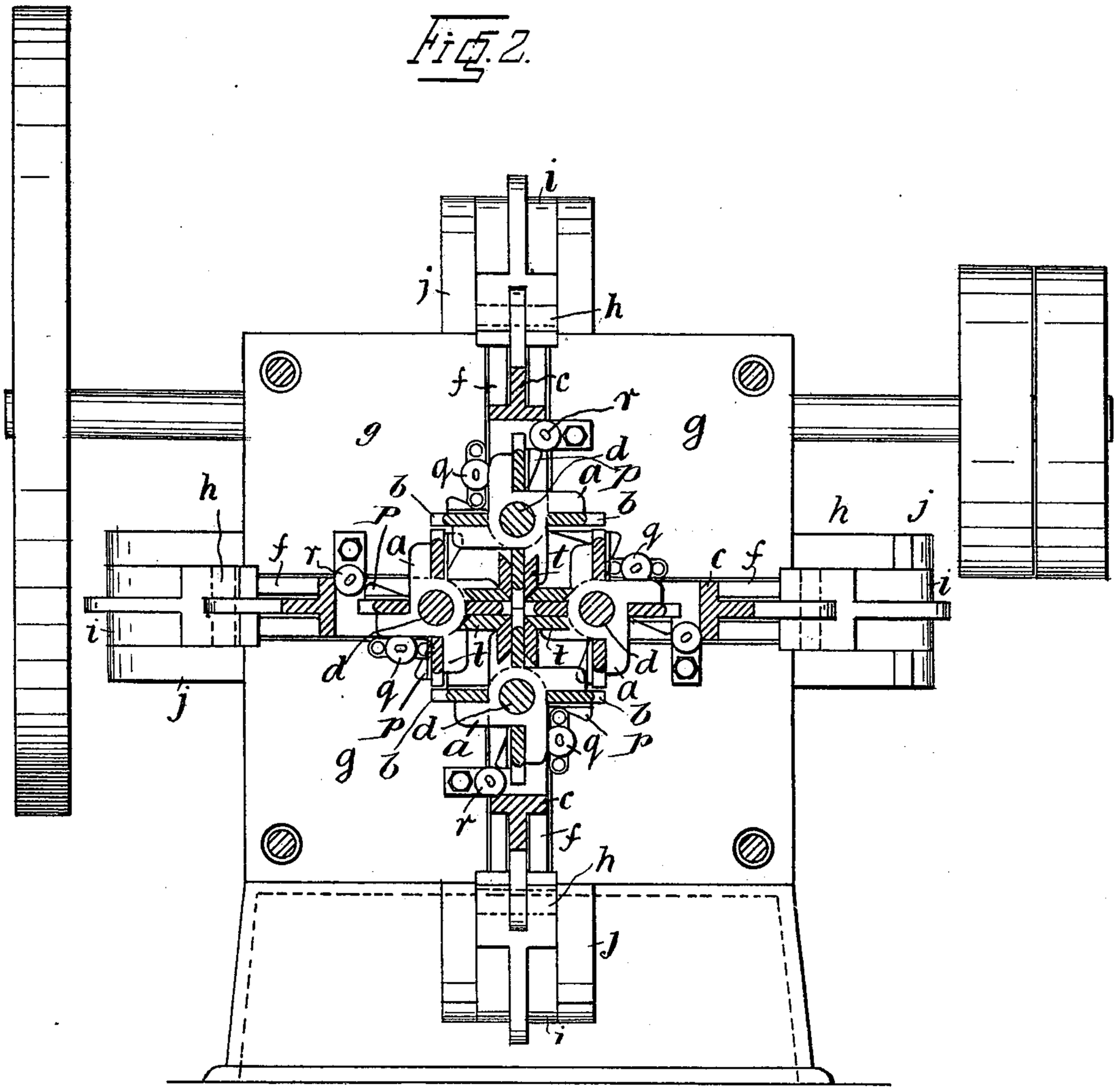
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

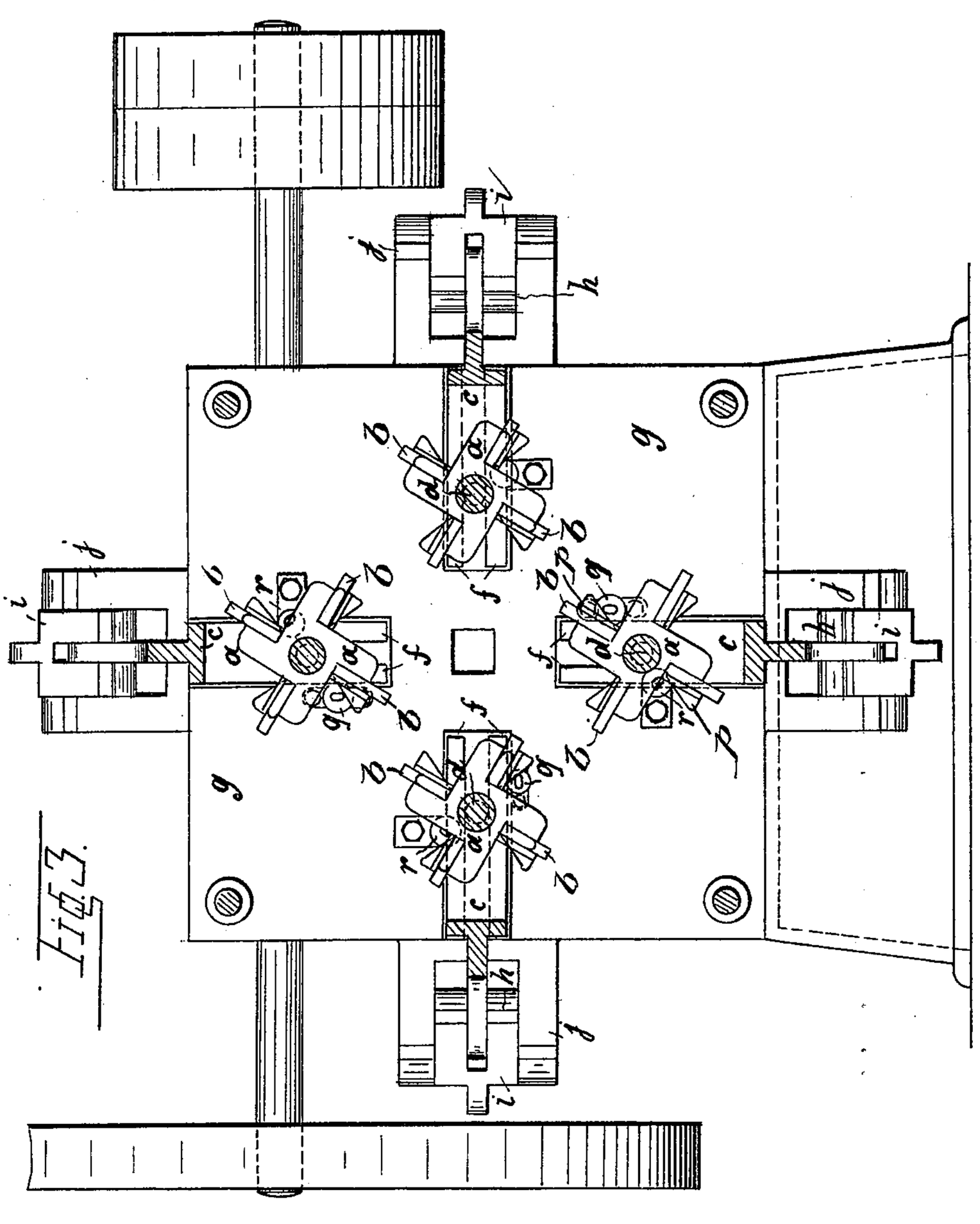

Fig. 3.

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UNITED STATES PATENT OFFICE.

FRIEDRICH WILHELM WESNER, OF CHARLOTTENBURG, GERMANY.

FORGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,481, dated August 22, 1899.

Application filed March 13, 1899. Serial No. 708,817. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH WILHELM WESNER, a subject of the German Emperor, residing at Charlottenburg, in the German Empire, have invented certain new and useful Improvements in Forging-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to machines for forging or making rivets, bolts, chains, and other articles from metal in a red-hot state.

The object of my invention is to construct machines of this kind so as to enable the tools, dies, or hammers that act on the hot metal to be easily and readily cooled. This object is attained by mounting the dies or hammer-heads on rotative carriers which instead of carrying only one die or hammer-head is adapted to carry a number of equally-shaped dies or hammer-heads, so that either of the dies or hammer-heads may be made to operate upon the hot metal and after operation be turned aside so as to be cooled, while another die or hammer-head takes the place of the first hammer-head or die and continues the operation upon the hot-metal blank. The die which is turned aside may be cooled in any convenient manner without interfering with the die at present in action in any way, which after exerting its pressure or blow on the blank is itself turned aside, giving way for the next die and being brought into position for being cooled. In this manner all the dies or hammer-heads can be fully kept cool to the desired extent and can always act on the red-hot blank when in a cool condition, so that it is quite impossible that the tool be annealed by the repeated contact with the red-hot blank. Evidently the machine provided in this manner can produce a greater output than any known forging-machine, since it can be allowed to run with very much greater speed.

In the drawings is shown one mode of constructing the machine, which, however, can be altered in many ways without departing from the spirit of my invention.

Figure 1 shows a sectional elevation of one kind of forging-machine. Fig. 2 shows an end view of the same, and Fig. 3 shows an end view with the dies or hammer-heads in a different position.

In the machine as shown in the drawings it is assumed in the way of example that at each blow four dies or hammer-heads strike against the blank. Each tool-carrier *a* is so constructed that a number of dies or hammer-heads *b*—for instance, four, as shown—can be mounted on the same, so that after every reciprocating movement the carrier will be turned about an angle of ninety degrees. For this purpose the tool-carrier *a* is mounted on a shaft *d*, journaled in the arms of a yoke *c*, which is adapted to slide between guides *f* on the frame *g* of the machine. The yokes *c* are connected to the ends of levers *i* by means of pivots *h*, which levers are fulcrumed at *j* to the frame and connected at their other ends by links *k* to a common cross-head *l*. This cross-head *l* is connected to a crank-shaft *n* by a rod *o*, which shaft is driven in suitable manner by a pulley and belt or by a gearing or otherwise. By the rotation of the said shaft *n* and reciprocation of the rod *o* the levers *i* are oscillated in unison, thus giving the yokes *c* a reciprocating motion toward and away from each other. The tool-carriers *a*, having the shape of spiders, are provided on every arm with lateral inclined faces *p*, which at the outward motion of the yokes engage studs *q*, so that the carriers are turned part of a revolution. The stud may be arranged in a suitable socket on the frame of the machine. In the construction as shown in the drawings the position of the studs *q* with respect to the inclined faces *p* is such that by their engagement the carriers *a* are turned about an angle of sixty degrees when moved outward. The last part of the requisite turn—that is, the remaining thirty degrees—the carriers are turned at their inward movement by means of the studs *r*, arranged in sockets on the frame on the other side of the center line. The ends of the studs which may be put under tension of spiral springs *s* are beveled upon one side, so that only in one direction they can resist the stroke of the tool-carrier, while in the other direction they are pushed inward by their oblique ends and allow the

carriers to pass without giving them a rotative movement.

Before and after rotation of the tool-carriers by the outward and inward movement of the yokes *c* the dies are guided by guide-pieces *t*, so that they operate upon the blank exactly in the correct position. The stud *q* may be so arranged that on the outward movement of the yokes alone the requisite rotation is produced. It is, however, preferred to allow the requisite rotation to be partly fulfilled at the outward stroke and partly by the inward stroke of the yokes, since in this way the time necessary for the operation is lessened. The dies of two opposite carriers are shorter than the dies of the other carrier to prevent collision when the carriers move toward each other.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A forging-machine having a rotatable tool-carrier and a number of forging-tools mounted on such carrier, with means for reciprocating the carrier, and means for turning the carrier at intervals to present a cool tool in place of one that has become heated by the forging operation.

2. A forging-machine having a rotatable tool-carrier, and a number of forging-tools mounted on such carrier, with means for reciprocating the carrier, and means mounted on the frame adapted to turn the carrier at intervals to present a cool tool in place of one that has become heated by the forging operation.

3. A forging-machine having a rotatable tool-carrier, a number of forging-tools mounted on such carrier, a yoke on which said carrier is rotatively mounted, means for reciprocating the yoke, and means for turning said carrier.

4. A forging-machine having a rotatable tool-carrier, a number of forging-tools mounted on such carrier, a yoke on which the carrier is rotatively mounted, means for reciprocating said yoke, guides for said yoke, and means which on the movement of the yoke in one direction gives the tool-carrier a part of a rotation.

5. A forging-machine having a rotatable and reciprocating tool-carrier, a number of tools mounted on said carrier, and a spring-actuated stud beveled at its front, and adapted to give way when the tool-carrier passes in one direction, and to engage and turn the carrier when it passes in the other direction.

In testimony whereof I affix my signature in presence of two witnesses.

FRIEDRICH WILHELM WESNER.

Witnesses:

WOLDEMER HAUPT,

HENRY HASPER.