

J. & C. SCHMERBER, & J. A. ARRAULT.
Machine for Grinding and Mixing Celluloid and Other
Plastic Compositions or Substances.
No. 229,477. Patented June 29, 1880.

Fig. 1

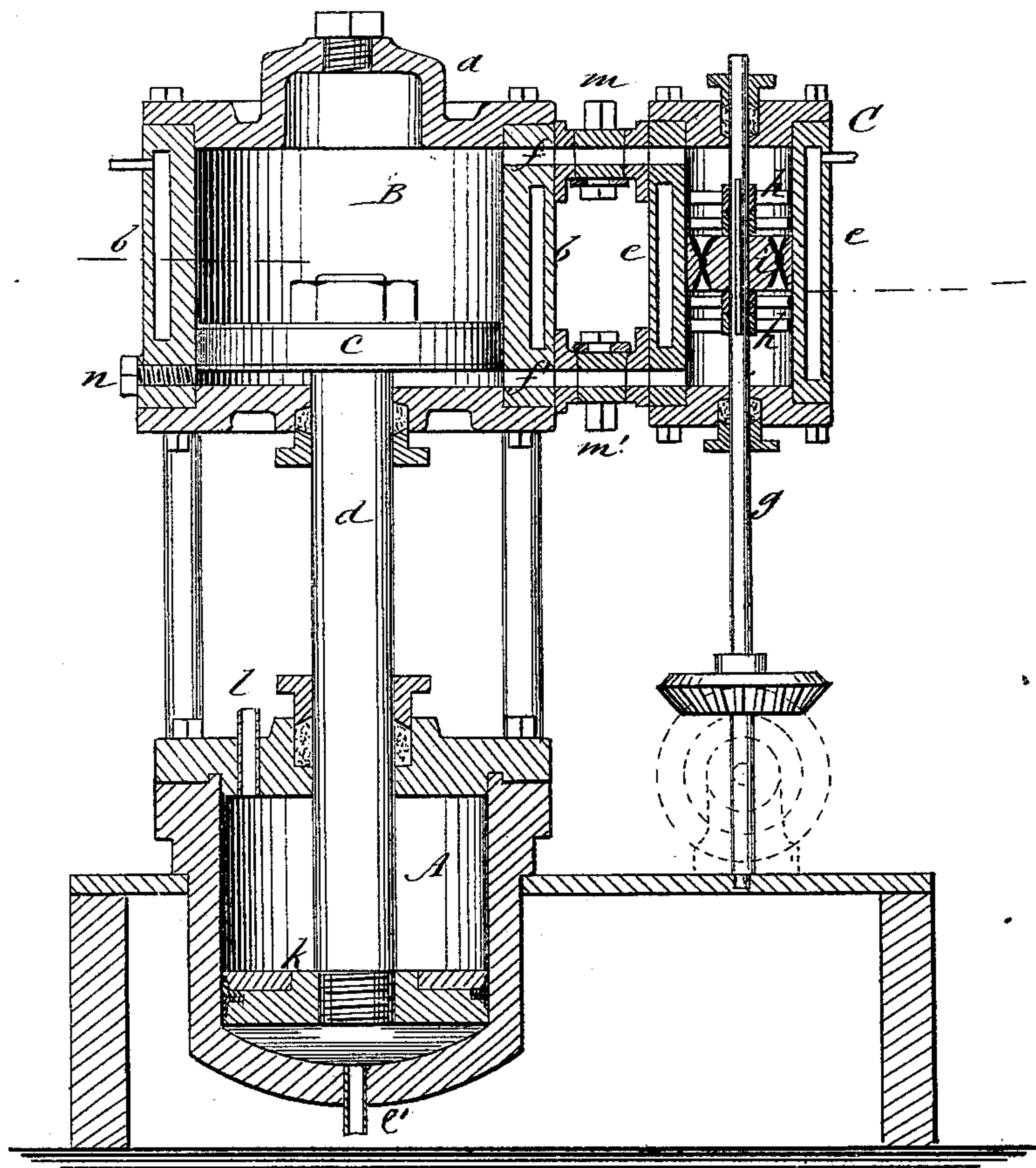


Fig. 2

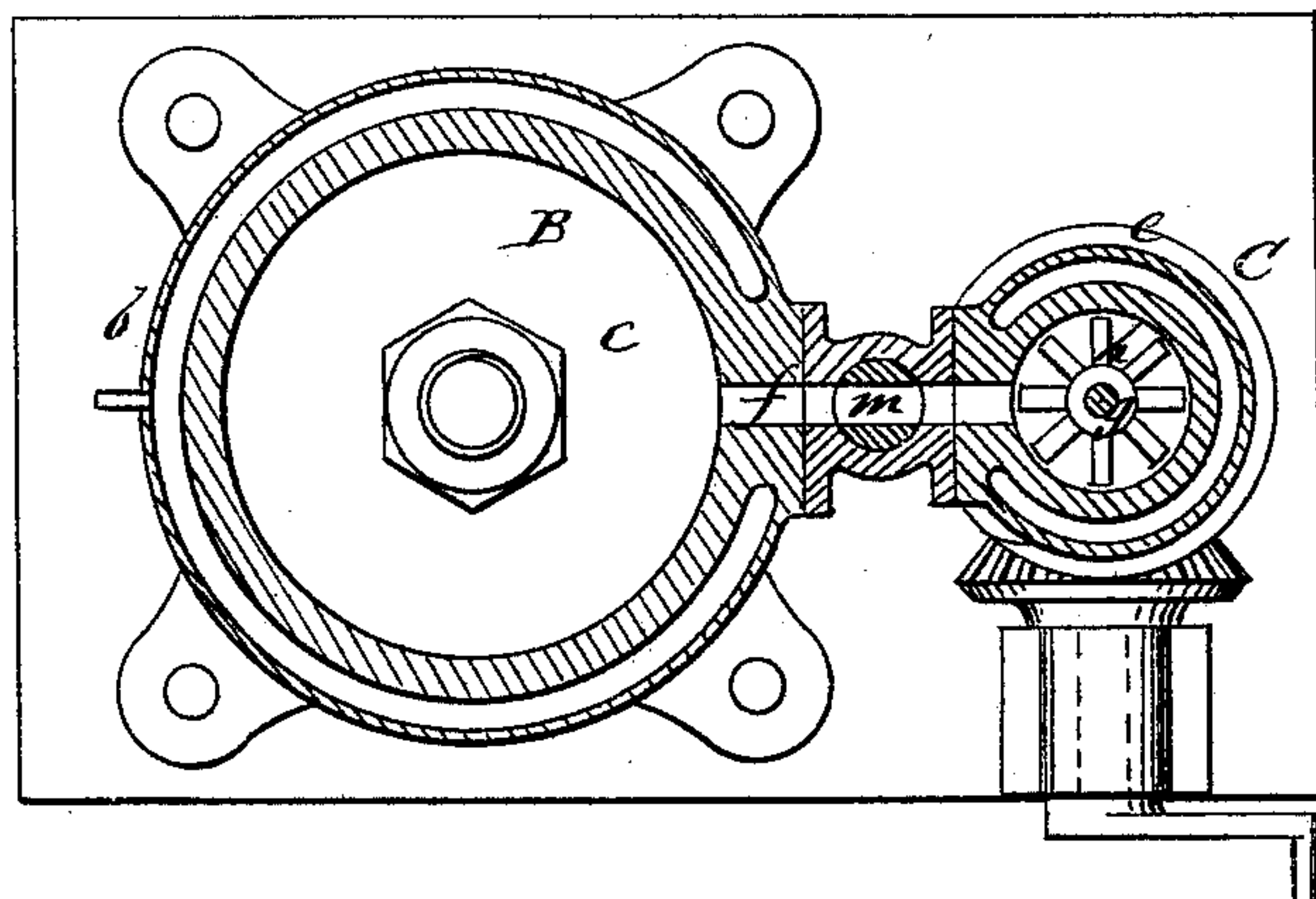


Fig. 3

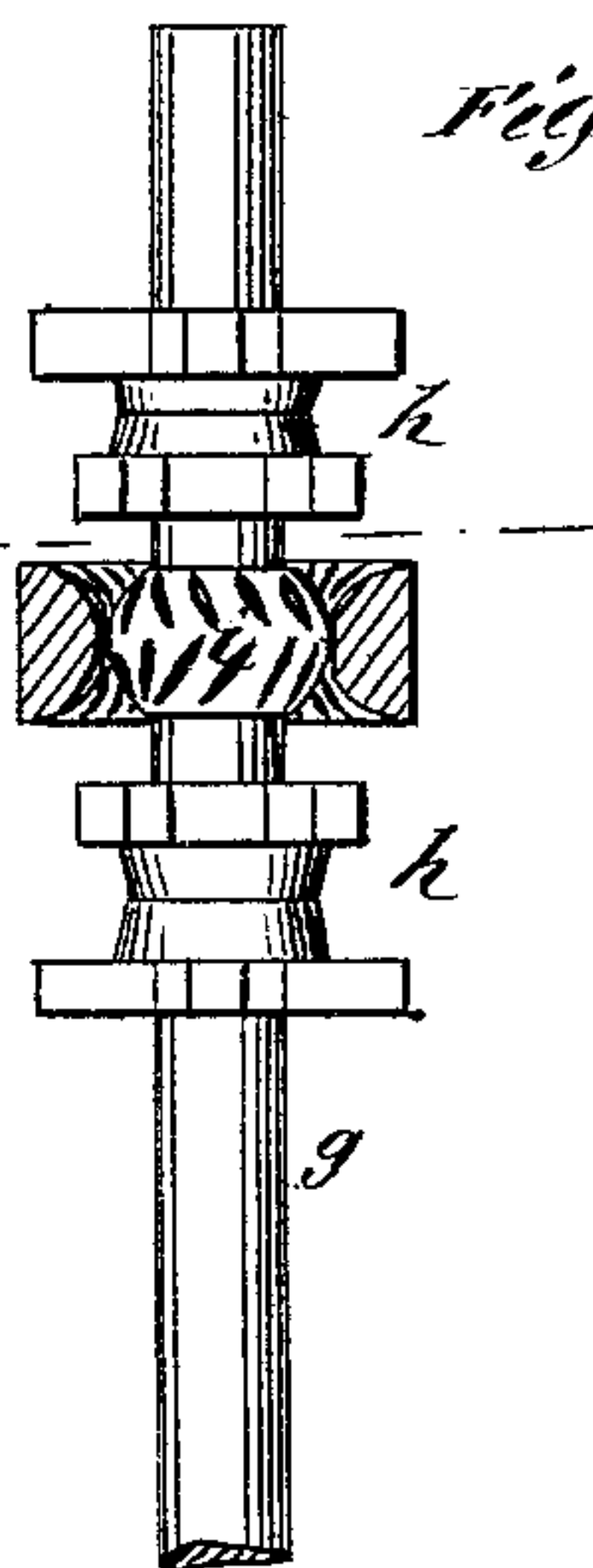


Fig. 4

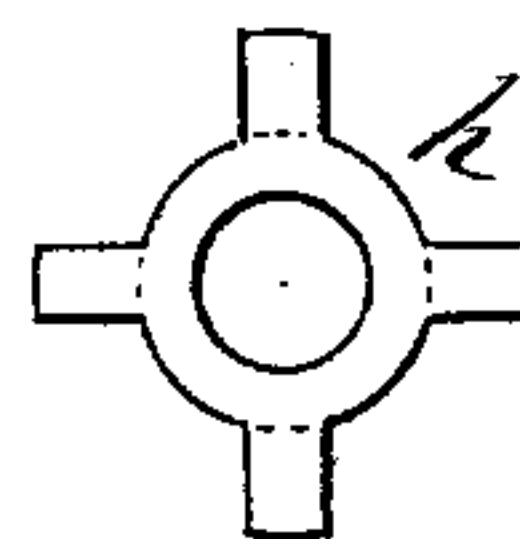
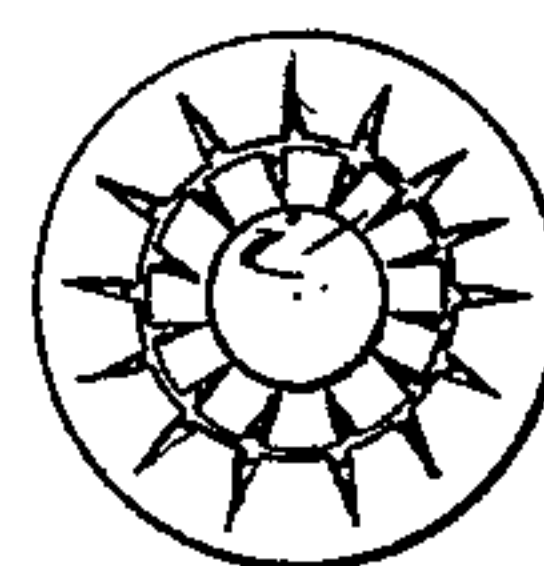


Fig. 5



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UNITED STATES PATENT OFFICE.

JULES SCHMERBER AND CHARLES SCHMERBER, OF PATERSON, NEW JERSEY, AND JULES A. ARRAULT, OF NEW YORK, N. Y.

MACHINE FOR GRINDING AND MIXING CELLULOID AND OTHER PLASTIC COMPOSITIONS OR SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 229,477, dated June 29, 1880.

Application filed November 17, 1879.

To all whom it may concern:

Be it known that we, JULES SCHMERBER and CHARLES SCHMERBER, of Paterson, in the county of Passaic and State of New Jersey, and JULES A. ARRAULT, of the city, county, and State of New York, have invented a new and useful Improvement in Machines for Grinding and Mixing Celluloid or other Plastic Compositions or Substances, of which
10 the following is a specification.

Our improvements relate to machines used for mixing and grinding plastic compounds, such as pyroxyline compounds or others of which the solvents or part of the ingredients,
15 being volatile, require working in closed apparatus to prevent loss of the volatile portions. We make use of a hollow cylinder for receiving the plastic material, formed with a steam-jacket and fitted with a piston that is to be
20 reciprocated by suitable power, and the cylinder is connected by passages at its opposite ends with the grinding-machine, so that by the movement of the piston the material is forced back and forth through the grinder until the operation of mixing and grinding is
25 completed, all of which is set forth more particularly hereinafter, with reference to the accompanying drawings, wherein—

Figure 1 is a vertical longitudinal section of
30 the machine. Fig. 2 is a sectional plan view. Fig. 3 is an elevation of the cutters and grinders in larger size. Figs. 4 and 5 are plan views of the cutters and grinders separately.

Similar letters of reference indicate corresponding parts.

B is a cylinder of suitable size, fitted with a removable cap or head, *a*, and formed with a jacket, *b*, between which and the cylinder is a space for steam that is to be supplied by suitable pipes. Within the cylinder *b*, fitting
40 tightly, is the piston-head *c* on the end of the rod *d*.

C is a smaller cylinder, also formed with a steam-jacket, *e*, and connected by the pipes *f f'*
45 with cylinder B. A shaft, *g*, that is to be revolved by suitable power by any desired connections, passes through the cylinder C, and carries within the same the cutters *h* and grinding-cone *i*. These cutters and grinders
50 may be of any desired character. As shown,

the cutters are fixed radially on shaft *g*, above and below the grinder, and the grinder is made in double conical form, with a ribbed surface and surrounded by a fixed curb, between which and the cone the material will
55 pass. In the pipes *f f'* are cocks *m m'*, and in the lower part of cylinder B is a screw-plug, *n*.

The rod *d* and piston-head *c* are to be fitted for reciprocation by power in any desired manner. As shown, the rod enters the hydraulic cylinder A and carries therein a head, *k*. The cylinder is fitted at its opposite ends with pipes *l l'*, which will be connected to a force-pump, so that water can be injected at either
65 side of head to move the rod *d*.

The machine is operated as follows: The piston-head *c* being at the lowest point, head *a* of the cylinder is to be removed, the material to be worked placed in the cylinder, and
70 the head *a* then replaced and secured. Steam is then to be admitted to the jackets of the cylinders B C until the material is thoroughly heated to the required temperature—say from 100° to 220° Fahrenheit—and the force-pump
75 is then started for operating rod *d* and the shaft *g* also put in operation. As the piston-rod *d* moves upward the head *e* forces the material in the cylinder B, through the pipe *f* to the cylinder C, through the cutters *h* and grinders *i*, and by the pipe *f'* back to the cylinder B, beneath the head *e*. When the piston has finished its upward stroke the power is to be applied to carry it downward and force the plastic material back through the pipe *f'*, cylinder C, and pipe *f* to cylinder B. This operation is to be repeated until the material is thoroughly ground and mixed to a homogeneous mass. The piston is then to be stopped with the head *e* at the upper end of cylinder
90 B, the cocks *m m'* are to be closed, plug *n* removed, and the power then applied to bring the piston down and force the material out by the opening made by removal of plug *n*. The machine is then ready for a fresh supply. 95

It will be seen that the grinding and mixing operations are performed while the material is inclosed in air-tight spaces, and it is obvious that the machine may be used to great advantage with materials containing volatile 100

ingredients. The grinding and mixing will be thoroughly done and the operation kept up for the required length of time, according to the character of the material being worked.

5 Having thus described our invention, we claim as new and desire to secure by Letters Patent—

10 1. In machines for mixing and grinding plastic materials, the closed cylinder B, for receiving the material, fitted with a reciprocating piston, and the cylinder C, connected at top and bottom with cylinder B, and fitted with the cutters and grinders, combined substantially as described and shown.

15 2. In machines for mixing and grinding plastic materials, the closed cylinder B, for containing the material, surrounded by a steam-jacket, as and for the purposes set forth.

3. In machines for mixing and grinding plastic material, the closed cylinder C, fitted 20 with the shaft *g*, cutters *h*, and grinder *i*, and provided with inlet and outlet pipes for the passage of the material, substantially as described and shown.

4. In machines for grinding and mixing 25 plastic material, the combination, with a closed cylinder for receiving the material and the reciprocating piston, of a hydraulic cylinder fitted with pipes for the injection of liquid, substantially as and for the purposes set forth.

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