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PATENTED JULY 9, 1907.

J. NATTERER.
UNIVERSAL ROLLING MACHINE.
APPLICATION FILED NOV. 27, 1906.

3 SHEETS—SHEET 1.

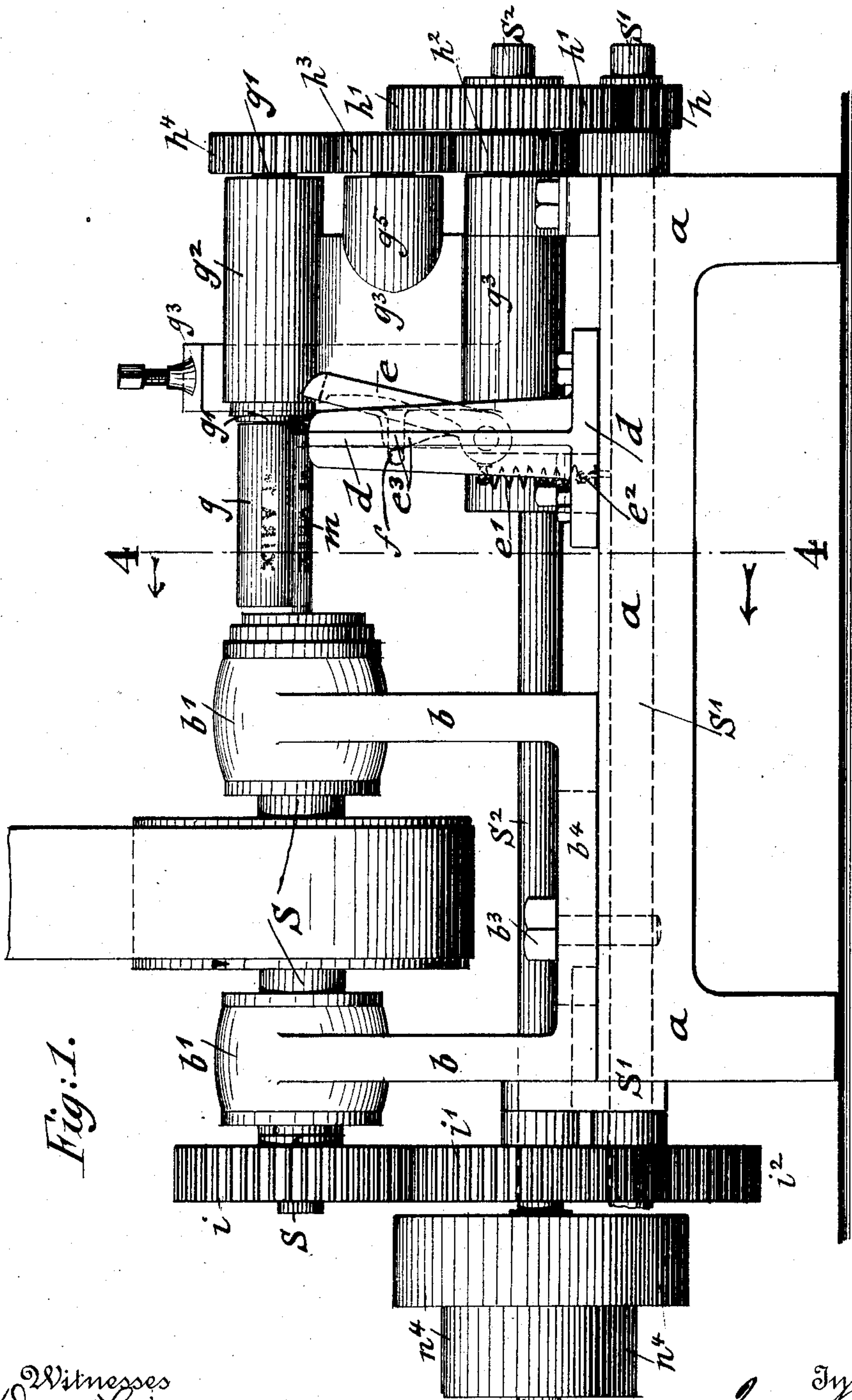


Fig. 1.

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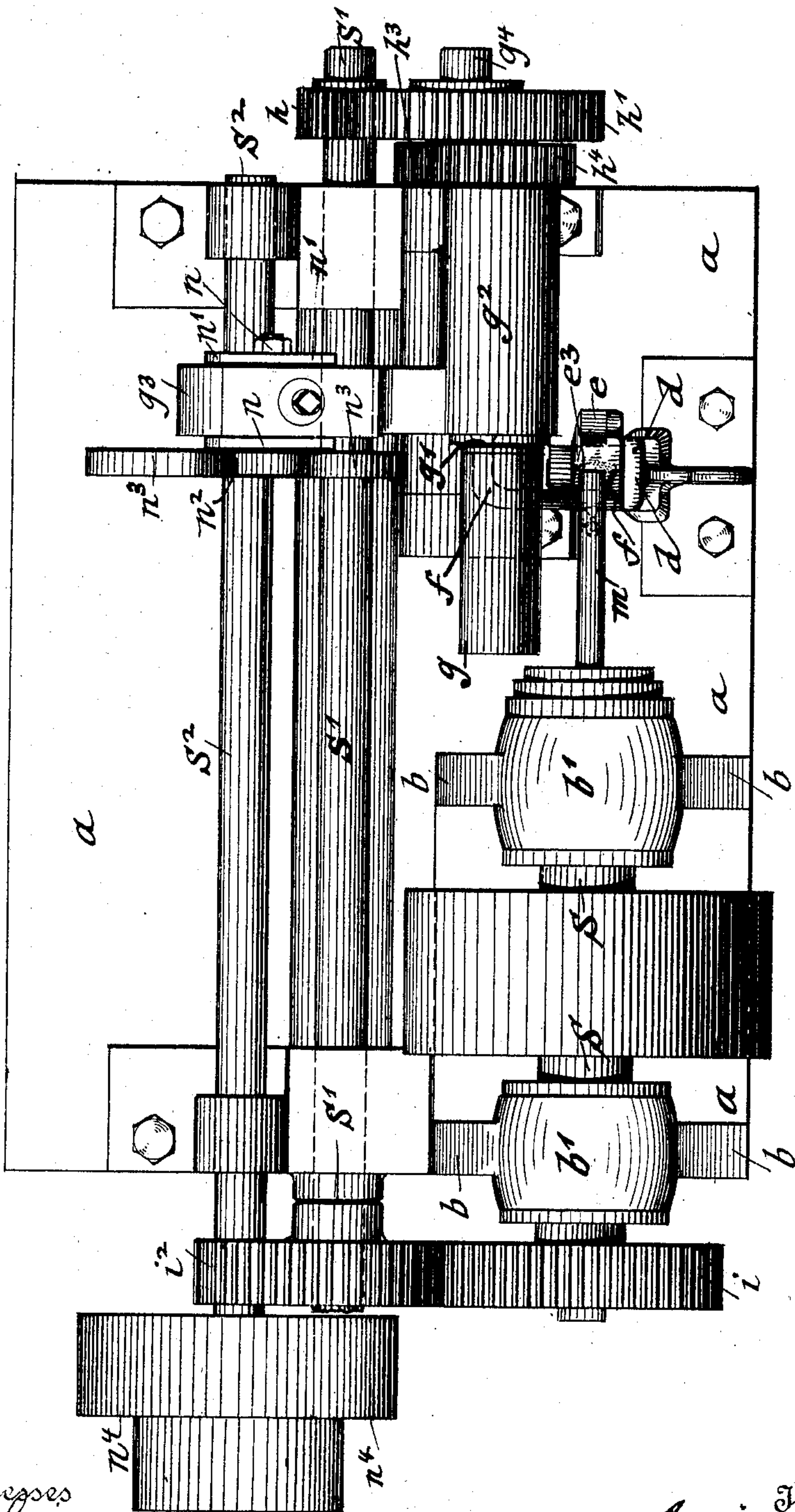
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig:4

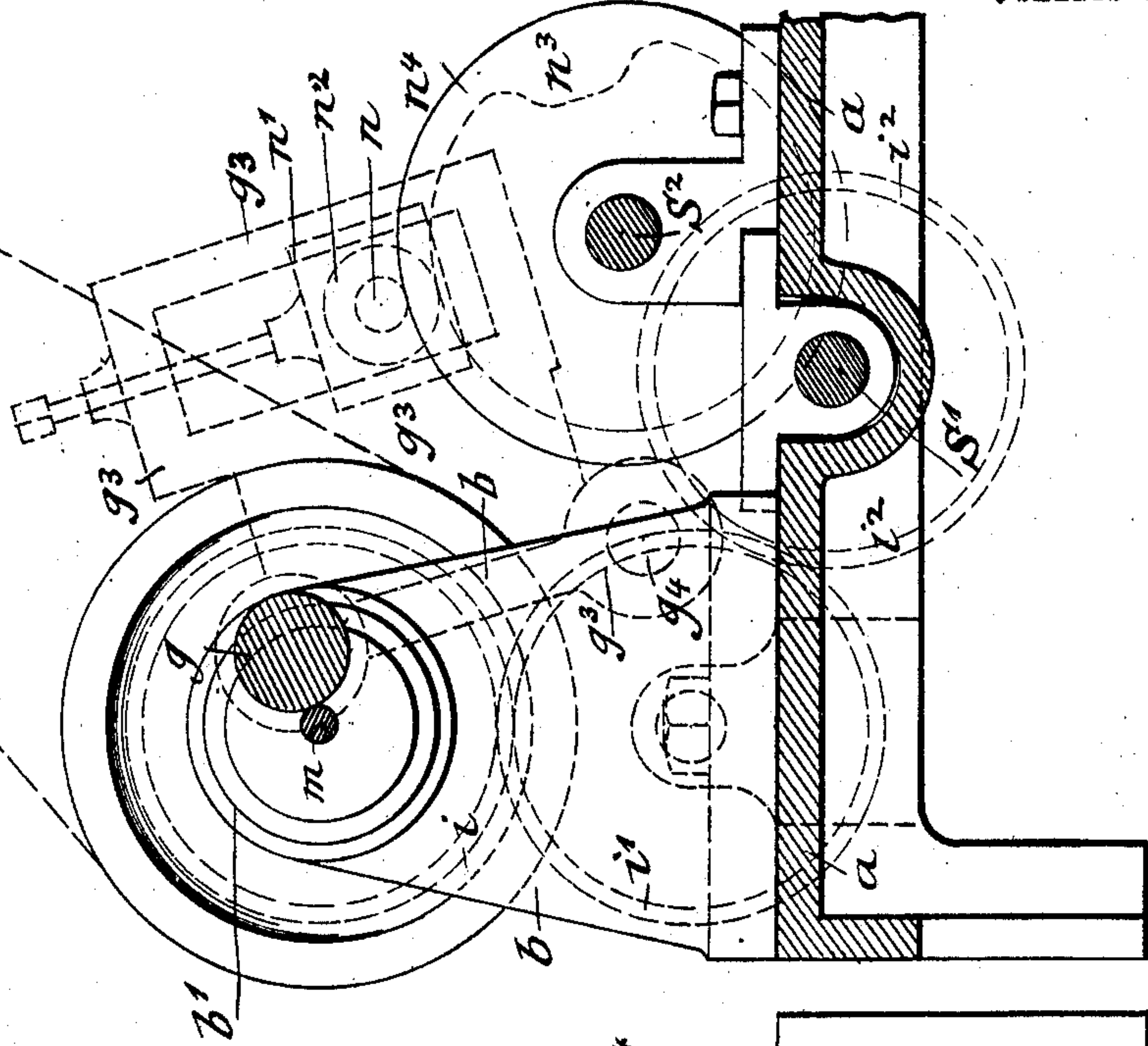
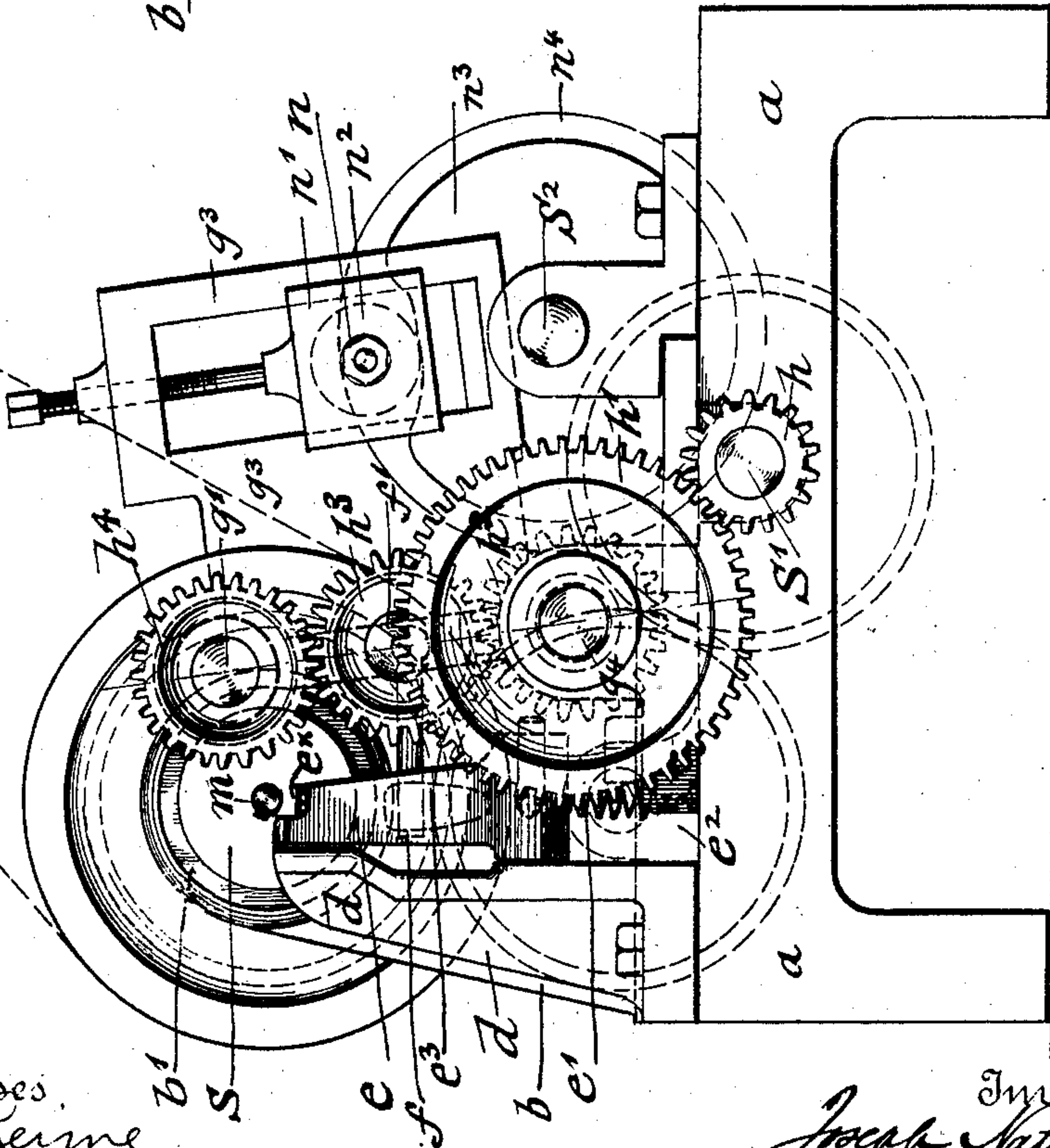


Fig:3.



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UNITED STATES PATENT OFFICE.

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UNIVERSAL ROLLING-MACHINE.

No. 859,613.

Specification of Letters Patent.

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Application filed November 27, 1906. Serial No. 345,382.

To all whom it may concern:

Be it known that I, JOSEPH NATTERER, a citizen of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Universal Rolling-Machines, of which the following is a specification.

This invention relates to an improvement in rolling machines of that type by which shells and tubes of all kinds can be shaped and embossed with any suitable letters or characters.

In the rolling machines heretofore in use the embossing of sheet-metal shells and the like could only be accomplished when the same had a diameter of certain size. For shells and tubes of smaller diameters the machines could not be used.

The object of this invention is to furnish a machine for shaping and embossing shells and tubes of any diameter with the required letters and characters, so that the machine can be used equally well for large and small sizes of shells and be therefore of general application and universal use; and for this purpose the invention consists of a rolling machine for sheet-metal articles, which comprises a mandrel having raised letters or characters, means for rotating the same, a large roller provided with a plurality of letters or characters in intaglio corresponding to the raised letters or characters on the mandrel, an oscillating arm for supporting said roller, an embossing roller arranged in the frame connected with said arm, and means for imparting intermittent oscillatory motion to said arm and frame so as to permit the intermittent action of the embossing roller on the shell or tube placed on the mandrel.

The invention consists further of a stationary standard arranged sidewise of the rotary mandrel, and a pivoted and spring-actuated arm that is adapted to be moved between the standard and mandrel for supporting the end of the mandrel while the rolling and embossing action takes place, said arm being permitted to oscillate by the action of a curved arm that engages a cam on said oscillating arm for imparting oscillating motion at the proper time thereby; and the invention consists lastly of certain additional details of construction and combinations of parts which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a side-elevation of my improved universal rolling machine, Fig. 2 is a plan-view, Fig. 3 is an end-elevation, and Fig. 4 is a vertical transverse section on line 4, 4, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures of the drawings.

Referring to the drawings, *a* represents the supporting bed-plate of my improved universal rolling machine. On the bed-plate *a* are supported upright standards *b*, *b* which carry the journal-bearings *b*¹ for a shaft *S*, to which rotary motion is transmitted by a belt-and pulley-transmission from an overhead driving-shaft. Into the end of the shaft is screwed a mandrel *m* on which the letters or characters that are to be embossed into the sheet-metal shell or tube are arranged in relief, the engraved mandrel being of any desired diameter. Sidewise of the mandrel *m* is supported on the bed-plate *a* an upright standard *d* which is provided at its upper part with a straight face adjacent to the end of the mandrel *m*. Between the mandrel *m* and the upright standard *d* is interposed an oscillating arm *e* which is pivoted at its lower end to a short stud-shaft on the standard and connected by a helical spring *e*¹ at its lower end with a hook or eye *e*² on the bed-plate *a*, said spring exerting a tendency on the arm *e* to move it into position between the end of the mandrel and the stationary standard *d*.

The oscillating arm *e* carries a cam-shaped projection *e*³ which is acted upon by the straight end of a bent arm *f* that is inserted into the inner end of an intermediate shaft *f*¹, to which rotary motion is imparted by a series of transmitting gear-wheels, so that at each rotation of the intermediate shaft *f*¹ the end of the curved arm *f* engages the cam-shaped face *e*³ of the oscillating arm *e* and moves the same against the tension of the spring *e*¹ in sideways direction, so as to clear the mandrel and the upright standard and permit thereby the removing of the engraved shell or tube from the mandrel, and the replacing of a new shell or tube on the same. By the tension of the spring *e*¹, the cam-shaped projection *e*³ of the oscillating arm *e* is placed in intermittent contact with the straight end of the curved arms *f*, and thereby the oscillating motion of the arm *e* is controlled. The upper end of the oscillating arm *e* is recessed at *e*^x, the recessed end fitting under the end of the mandrel *m* and serving as a support for the same against the pressure of an embossing roller *g* which carries three or four female dies which correspond to the male dies on the mandrel said dies being arranged equidistantly from each other on the circumference of the embossing roller *g*. The roller *g* is located at the end of a shaft *g*¹ that is supported in suitable bearings *g*² of an oscillating frame *g*³ which is pivoted at its lower end to the shaft *g*⁴ of the gear-wheels *h*¹, *h*², said shaft turning in bearings supported on the bed-plate *a*.

Rotary motion is transmitted to the shaft *g*¹ of the presser-roller *g* from the shaft *S*¹ by means of a series of transmitting gear-wheels *h*, *h*¹, *h*², *h*³ and *h*⁴, the auxiliary shaft *S*¹ receiving rotary motion from the

driving-shaft *S* by gear-wheels *i*, *i*¹, *i*², which are arranged at the opposite end of the bed-plate, as shown in Fig. 1. The gear-wheel *h* is keyed to the shaft *S*¹, the gear-wheels *h*¹ and *h*² to the short intermediate shaft *g*⁴ and the gear-wheels *h*³ and *h*⁴ to shafts in the bearings *g*⁵ and *g*² on the oscillating frame *g*³, the gear-wheels *h*³ and *h*⁴ oscillating with the frame *g*³. The gear-wheels *i*, *i*¹, *i*² are interchangeable, so as to impart different speeds to the shaft *S*¹. The rear-part of the oscillating frame *g*³ is provided with an oblong recess *r* in which are guided the adjustable bearings *n*¹ for a short shaft *n* which carries an antifriction-roller *n*² that moves in contact with a cam *n*³ on a shaft *S*², to which rotary motion is imparted by a cone-pulley *n*⁴ at the opposite end of the shaft *S*², by which the required speed is imparted to the cam *n*³. The speed at which the cam *n*³ is rotated has to be a multiple of the speed imparted to the mandrel *m*. The cam *n*³ imparts by the antifriction-roller *n*² oscillating motion to the frame *g*³ and embossing roller *g*, so that at each oscillating motion of the frame *g*³ one of the sets of letters and characters on the roller *g* is placed in contact with the shell or tube on the mandrel and embossed on the shell or tube in connection with the raised set of letters and characters on the mandrel.

The rotary motion of the mandrel and the rotary and oscillating motions of the embossing roller *g* are so timed that for each full rotation of the mandrel the embossing roller *g* makes one third of a rotation and three oscillating motions when three tubes or shells are to be successively embossed on the mandrel, while when four shells or tubes are to be embossed on the mandrel, the embossing roller has to make one fourth of a rotation for every rotation of the mandrel and four oscillating motions, one for every tube placed successively on the mandrel.—The supporting standards *b* for the bearings of the mandrel-shaft *S* are capable of longitudinal adjustment on the bed-frame *a* within certain limits, by a clamping-screw *b*³ which passes through a slot *b*⁴ in the connecting base of the standards into the bed-plate *a*, as shown in Fig. 1, so as to permit longer and shorter mandrels to be inserted into the shaft *S*. This requires also the adjustment of the motion-transmitting gears *i*, *i*¹, *i*² on the corresponding gear-shafts and in some cases the shifting of the cone-pulley *n*⁴.

The operation of my improved universal rolling machine is as follows: When the embossing roller *g* is moved away from the mandrel by the action of the depression in the cam *n*³, the oscillating arm *e* is simultaneously moved away from the same, as shown in Figs. 1 and 3. The shell or tube to be embossed can then be placed on the mandrel. The actuating cam *n*³ then engages the antifriction-roller *n*² of the oscillating frame *g*³ and moves the embossing roller in contact with the shell or tube on the mandrel, while simultaneously the curved arm *f* recedes and releases the cam on the face of the oscillating arm *e*, so that the latter enters with its recessed upper end between the upper end of the standard *d* and the end of the mandrel and holds the same rigidly in position for resisting the pressure of the embossing roller on the shell or tube on the mandrel, whereby a clear and accurate embossing on the shell or tube is obtained. The rotation of the

mandrel and the rotation and oscillating of the embossing roller are timed in such a manner that the engraved portions register with each other when the embossing action on the shells or tubes takes place. After the embossing of the shell or tube is accomplished, the embossing roller recedes from the mandrel when the antifriction-roller *n* drops into the recessed portion of the cam, while simultaneously the oscillating arm clears the mandrel under the influence of the pressure of the curved arm *f* on its cam, so that the engraved shell or tube can be removed and a new shell or tube placed on the mandrel. The embossing-roller is then turned for a third or fourth part of the rotation and then oscillated forward so as to act again on the next tube or shell on the mandrel, whereby the embossing action is repeated in the same manner as before and so on, the motion of the parts being accomplished automatically by the transmitting mechanism described, while the removing of the embossed shell or tube and the replacing of a new one on the mandrel are accomplished by the attendant or by automatic-feeding devices.

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

1. In a universal rolling machine, the combination of a rotary mandrel provided with raised letters or characters, an embossing roller, means for imparting rotary motion to said roller, an oscillating frame supporting said roller, means for imparting oscillating motion towards and away from said mandrel to said roller, and means for supporting the mandrel while the embossing action on the shell or tube on the mandrel takes place.
2. In a universal rolling machine, the combination, with a rotary mandrel provided with raised letters or characters, of an embossing roller provided with corresponding letters or characters in intaglio, means for imparting continuous rotary motion to said embossing roller, an oscillating frame supporting said roller provided with an antifriction roller, a cam for imparting oscillatory motion to said frame and embossing roller for intermittently forming contact with the shell or tube on the mandrel, and means for supporting said mandrel while the embossing action takes place.
3. In a universal rolling machine, the combination with a rotary mandrel provided with raised letters or characters, of an embossing roller provided with corresponding letters or characters in intaglio, means for imparting continuous rotary motion to said embossing roller, an upright standard, an oscillating arm pivoted to said standard, and means for moving said arm into position between the mandrel and standard so as to support the former while the embossing action on the shell or tube on the mandrel takes place.
4. In a universal rolling machine, the combination, with a rotary mandrel provided with raised letters or characters, of an embossing roller provided with corresponding letters or characters in intaglio, means for imparting continuous rotary motion to said embossing roller, a stationary upright standard, a spring-actuated arm pivoted to said stationary standard and provided with a cam at its face and a recessed upper end, means for intermittently moving said arm out of contact with the mandrel, and means for returning it in position between the mandrel and standard for supporting the former while the embossing action on the shell or tube on the mandrel takes place.
5. In a universal rolling machine, the combination, of a mandrel provided with raised letters or characters, an embossing roller provided with corresponding letters and characters in intaglio, means for imparting continuous rotary motion to said embossing roller at a speed which is a multiple of the speed of the mandrel, an upright standard sidewise of the mandrel, a spring-actuated arm pivoted to said standard, means for intermittently oscillating said arm into position between the mandrel and embossing roller, and means for supporting the mandrel while the embossing action on the shell or tube on the mandrel takes place.

lating said arm in and out of contact with the mandrel and standard for supporting the former while the embossing action on the shell or tube on the mandrel takes place.

5 6. In a universal rolling machine, the combination of a rotary mandrel provided with raised letters or characters, an embossing roller, interchangeable gear-wheels for imparting rotary motion to said roller at a speed which is a multiple of the speed of the mandrel, a frame for supporting said roller, means for imparting oscillating motion to
10 said frame and roller towards and away from the mandrel,

and means for supporting the mandrel while the embossing action on the shell or tube on the mandrel takes place.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

JOSEPH NATTERER.

Witnesses:

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