

E. H. STRICKLER.
SODIUM SULFID.
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915,633.

Patented Mar. 16, 1909.

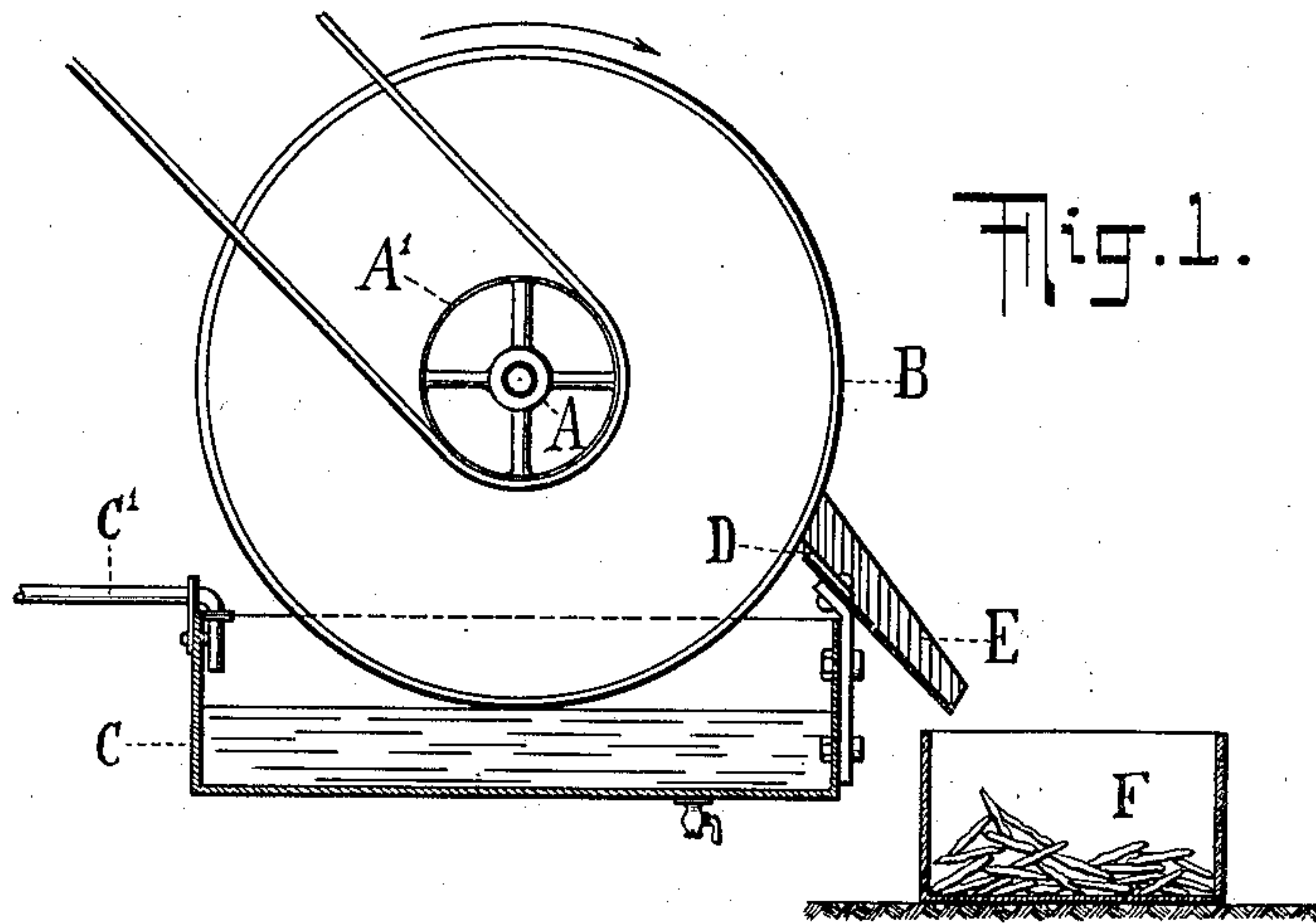


Fig. 1.

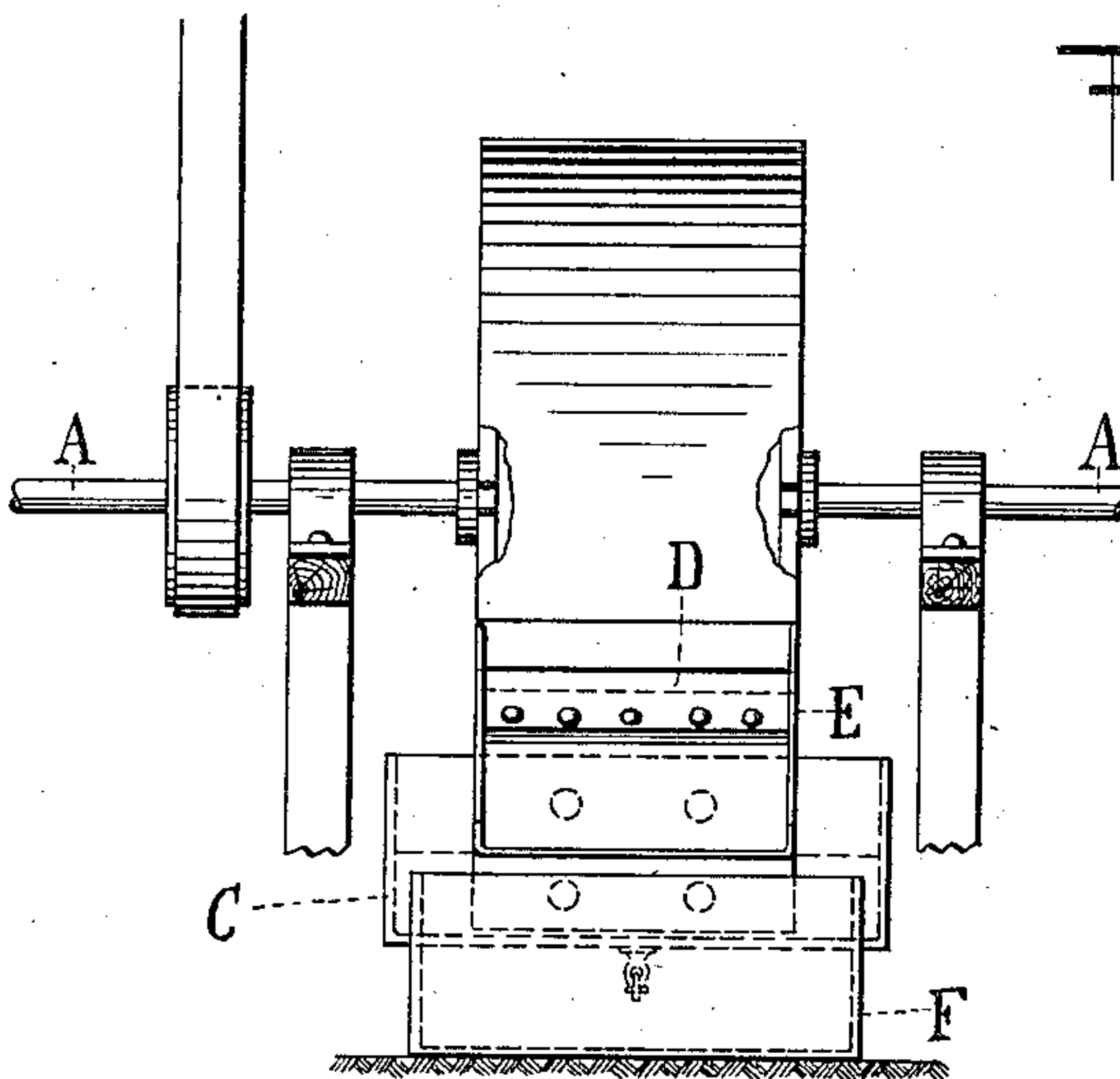


Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

EMERSON H. STRICKLER, OF WHITE PLAINS, NEW YORK, ASSIGNOR TO GENERAL CHEMICAL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SODIUM SULFID.

No. 915,633.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed January 7, 1908. Serial No. 409,634.

To all whom it may concern:

Be it known that I, EMERSON H. STRICKLER, a citizen of the United States, resident of White Plains, Westchester county, State of New York, have invented certain new and useful Improvements in Sodium Sulfid, of which the following is a specification.

My invention relates to the manufacture of sodium sulfid (Na_2S) and has for its object to produce it commercially at a low cost and of great purity, solubility and homogeneity.

At present sodium sulfid is sold in two forms for industrial purposes; as crystals, corresponding to the formula $\text{Na}_2\text{S} + 9\text{H}_2\text{O}$, and as a so-called concentrated product, which is one solid mass (usually contained in cans) containing less water than that required to form the crystals. Both of these forms are contaminated with impurities, especially the "concentrated" form, which moreover lacks homogeneity and ease of solution. The crystal form has the drawback of containing only a low proportion of sulfid (about 32½ %).

To obtain a new form of sodium sulfid which is just as rich in that chemical as the so-called "concentrated" sodium sulfid, and purer than either the concentrated or crystalline sodium sulfid, while just as soluble as the latter, I proceed as set forth hereinafter, making use, for instance, of an apparatus such as shown in the accompanying drawings in which—

Figure 1 is a side elevation of such apparatus, with parts in section, and Fig. 2 is an end elevation thereof, with parts in section.

To the shaft A which is driven by means of a belt pulley A' or otherwise is secured a metal roller or drum B, said drum being hollow and the shaft tubular with connections to circulate water or other cooling fluid through the drum, as indicated in Fig. 2. The lower portion of the drum dips into a hot melt of (impure) sodium sulfid (Na_2S) contained in a pan C to which the sulfid is supplied, preferably constantly, through a pipe C' or otherwise. At one side of the pan,

adjacent to the periphery of the drum B, is located a scraper D, and next to it a chute E leading to a receptacle F.

The drum B is rotated in the direction indicated by the arrow, so as to pick up the fused or molten sodium sulfid from the pan C and carry it toward the scraper D. The sodium sulfid should be concentrated to 60% or higher, such molten concentrated sulfid being supplied through the pipe C' at the same ratio as the drum removes it from the pan. If concentrated to 60% (by weight) the sulfid melts at about 183° F. A thin film of material is gathered on the surface of the drum, and by contact with the air and by the influence of the cooling fluid within the drum this material is rendered solid and brittle by the time it reaches the scraper D, it being understood that the rotary speed of the drum is adjusted accordingly. In this condition, the solidified material is easily peeled off the drum and broken by the scraper, so as to slide into the receptacle F through the chute E.

The product obtained consists of flat pieces (flakes) or laminæ, which contain 60% or more of Na_2S , are homogeneous in composition, and very readily soluble without requiring to be broken up for this purpose, the edges broken irregularly by the scraper affording a large surface to the solvent. As generally obtained, this product is distinguished by a uniform brick-red color.

The purity of the product is very high, and this is due to the fact that the drum B gathers material only from the top of the fused or molten sulfid, the upper layers being almost absolutely pure. The foreign matters present in the melt (chiefly oxidized salts, sodium thio sulfate, sodium sulfate, sodium carbonate, etc.,) gradually precipitate and settle out. They can be removed from time to time or continuously, through a valve G.

The rapid cooling of the material gathered by the drum, is an important feature, since segregation and oxidation are thus avoided, securing a pure product of uniform composition.

I claim as my invention:

The herein described new form of sodium
sulfid consisting of flakes or laminæ of great
purity and solubility, said laminæ being of
5 homogeneous composition and containing a
high percentage of Na_2S , with a smaller
amount of water than required for the crys-
tallization of said Na_2S as $\text{Na}_2\text{S} + 9\text{H}_2\text{O}$.

In witness whereof I have hereunto set my
hand in the presence of two witnesses, this 10
31st day of December 1907.

EMERSON H. STRICKLER.

Witnesses:

JOHN LOTKA,

JOHN A. KEHLENBECK.