

(No Model.)

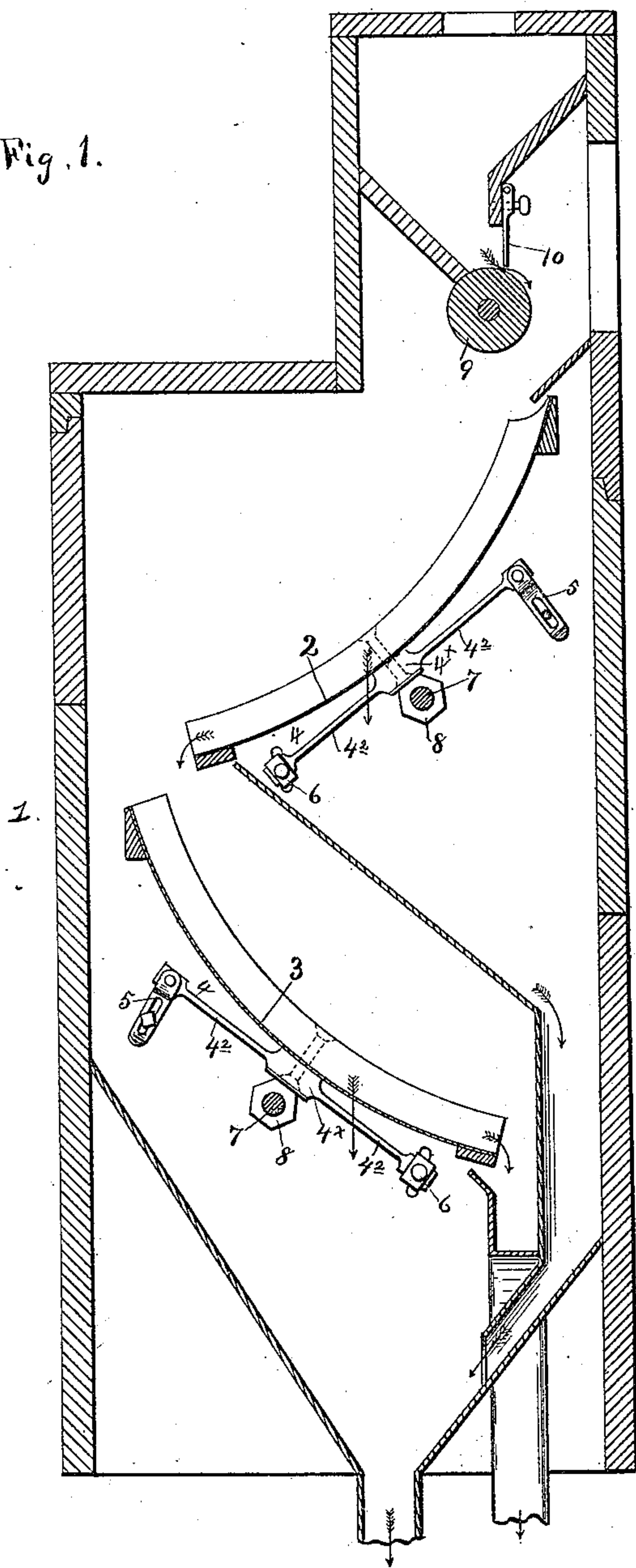
2 Sheets—Sheet 1.

F. NOBLE.
GRAVITY SCALPER.

No. 440,883.

Patented Nov. 18, 1890.

Fig. 1.



Witnesses.
Wm. H. Blodgett
Frank D. Merchant

Inventor.
Frank Noble
By his Attorneys.
Williamson & Blodgett

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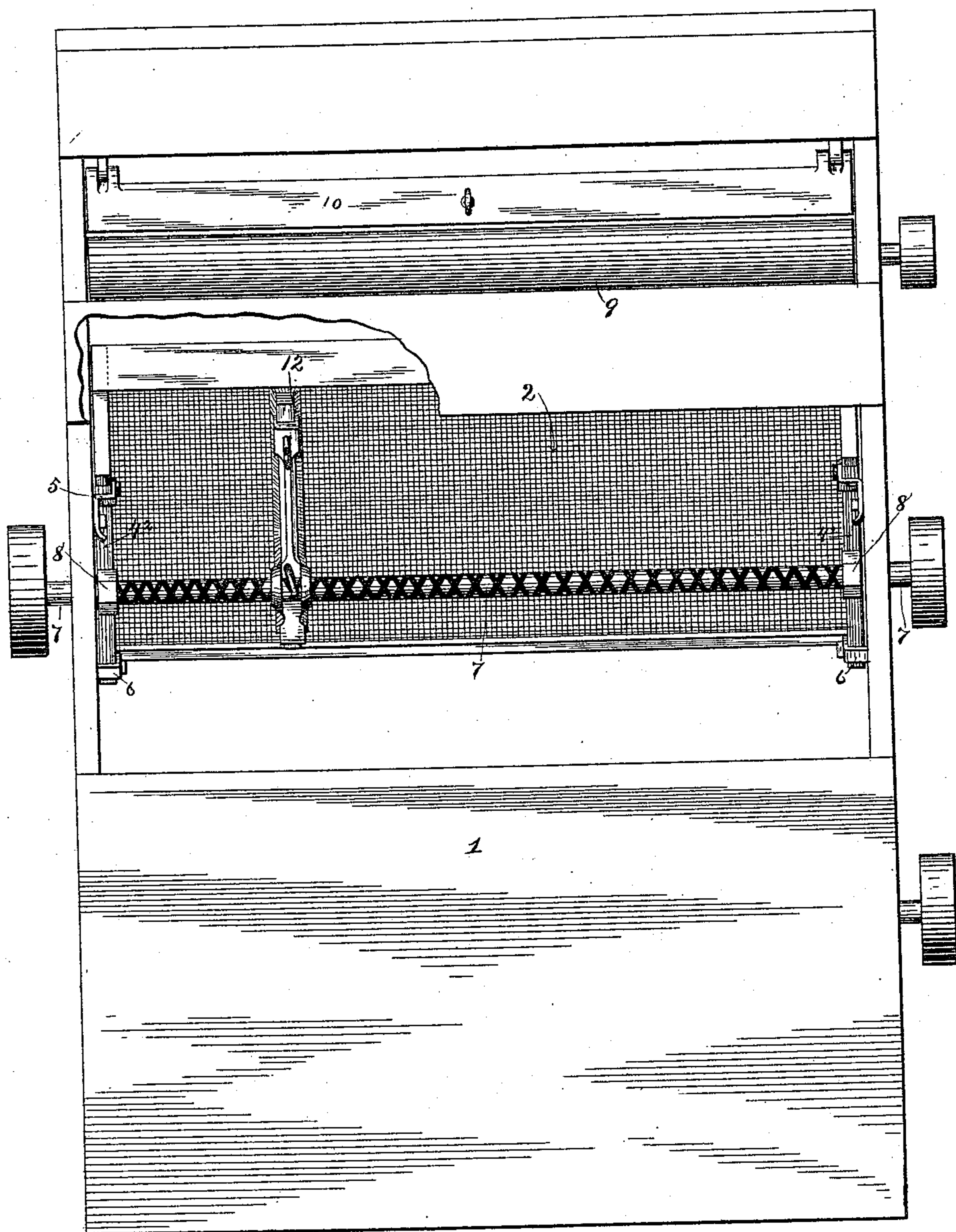
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Fig. 2.



Witnesses.

Wm. F. Blodgett,

Frank D. Merchant.

Inventor.

Frank Noble

By his Attorneys.

Williamson & Blodgett,

UNITED STATES PATENT OFFICE.

FRANK. NOBLE, OF MINNEAPOLIS, MINNESOTA.

GRAVITY-SCALPER.

SPECIFICATION forming part of Letters Patent No. 440,883, dated November 18, 1890.

Application filed April 14, 1890. Serial No. 347,846. (No model.)

To all whom it may concern:

Be it known that I, FRANK. NOBLE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Gravity-Scalpers; 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 invention relates to that class of grinding-mill appliances known as "gravity scalp-ers, graders, and bolters."

As is well known to those familiar with the art in modern milling, this class of devices are usually so constructed that the sieves stand at different levels, with the head of one adjacent to and adapted to receive the tail-ings from the foot of the other. In other words, the finer-meshed sieves or bolts are placed at the uppermost level and the coarsest at the bottom, and the different grades are drawn off in the same order.

To obtain a machine which will do this work well and rapidly has so far been found extremely difficult. Hitherto straight sieves have been used for the purpose. In order to make this effective the sieve must stand at a very sharp angle, not less than forty-five degrees, in order to give the stock the requisite start at the head of the sieve. The result is to make imperfect contact with the sieve-surface at all other parts of the sieve on account of the accelerated motion of the stock. This point of difficulty I overcome in my preferred construction by making the sieve concave on its face. I can therefore start the stock at the proper angle and the concavity of the sieve will retard its progress enough to offset the acceleration due to gravity. Perfect contact is thus afforded over the entire surface of the sieve, giving a very remarkable difference in result and greatly increasing the capacity of the sieve.

Another point of difficulty with all kinds of sieves has hitherto been to impart exactly the right kind of shaking motion thereto. Hitherto, so far as I am aware, these motions have either been to-and-fro motions length-wise of the sieve or unevenly distributed ver-

tical motions, both of which are more or less imperfect in their effects. I overcome these limitations and obtain a uniformly-distributed vibratory motion by centrally mounting the sieves on spring-bars, the flexible ends of which are secured to some relatively fixed support. These spring-bars are constructed with a rigid central portion and flexible ends, and the sieve is entirely supported by the rigid portion of the bar. Knockers are arranged to strike the bar to impart vibration to the sieve, and inasmuch as the flexible arms are both secured in fixed supports and the sieve is rigidly secured to the rigid part of the arms a series of short vibrations are thus imparted to the sieve, which is uniformly distributed over its entire surface, which has been found to be most efficient in its action. This form of support is of course applicable either to a straight or a curved sieve; but I prefer to use therewith the curved sieve, as it gives the most serviceable combination. The flexible arms of the spring-bars are preferably secured to the fixed supports by adjustable devices, so that the angle of the sieve may be varied at will.

In the accompanying drawings, wherein like letters refer to like parts throughout, Figure 1 is a vertical section of a gravity-scalper built in accordance with my preferred construction. Fig. 2 is a front elevation of the same, some parts being broken away.

1 is the frame-case of the gravity-scalper, and 2 and 3 are sieves mounted therein, which have curved or concave faces.

4 4 are bars provided with thickened central portions 4^x and flexible or spring-like arms 4², one of said bars being attached to each of the side frames of the sieve.

5 6 are adjustable brackets connecting the ends of the spring-bars to the frame or case.

7 is a rapidly-revolving reversely-threaded shaft provided with two hexagonal cams 8, one of which bears against the thickened central portion of each spring-bar, and therefore forces the sieve upward against the action of the spring-arms of the bar, which by their resiliency yield to permit this movement, and immediately react and force the sieve downward. In this manner the sieve is given a series of short rapid vibrations. Should it

be desired to set the sieve at a different angle, the nuts on the bolts connecting the brackets with the sides of the inclosing-box are loosened, and the sieve is adjusted and again secured in position.

9 is the usual feed-roller found in this class of devices, and 10 is the adjustable gate therefor.

12 is the brush on the shaft 7.

The operation is evident from the description already given.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination, with a spring-bar having a rigid central portion and flexible ends secured to relatively fixed supports, of a sieve mounted on the rigid portion of said bar and solely supported thereby, and a knocker adapted to strike said bar and impart vibration to said sieve.

2. The combination, with a suitable frame, of a pair of spring-bars having rigid central portions and flexible ends, adjustable devices for adjustably securing the ends of said bars to said frame, a sieve mounted on the rigid portions of said bars and supported solely thereby, and knockers for striking the rigid

portions of said bars and imparting vibration thereto, substantially as described.

3. The combination, with a spring-bar having a rigid central portion and flexible ends secured to relatively-fixed supports, of a curved sieve centrally mounted on the rigid portion of said bar, and a knocker for striking said bar and imparting vibration to said sieve, substantially as and for the purpose set forth.

4. A gravity-scalper comprising a suitable frame, a series of sets of spring-bars, one pair for each sieve, having rigid central portions and flexible ends secured to relatively fixed supports, a series of curved sieves centrally mounted one on each set of said spring-bars and solely supported thereby, and knockers for striking the rigid portions of said bars and imparting vibration to the sieve, substantially as described.

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

FRANK. NOBLE.

Witnesses:

WM. H. BLODGETT,
FRANK D. MERCHANT.