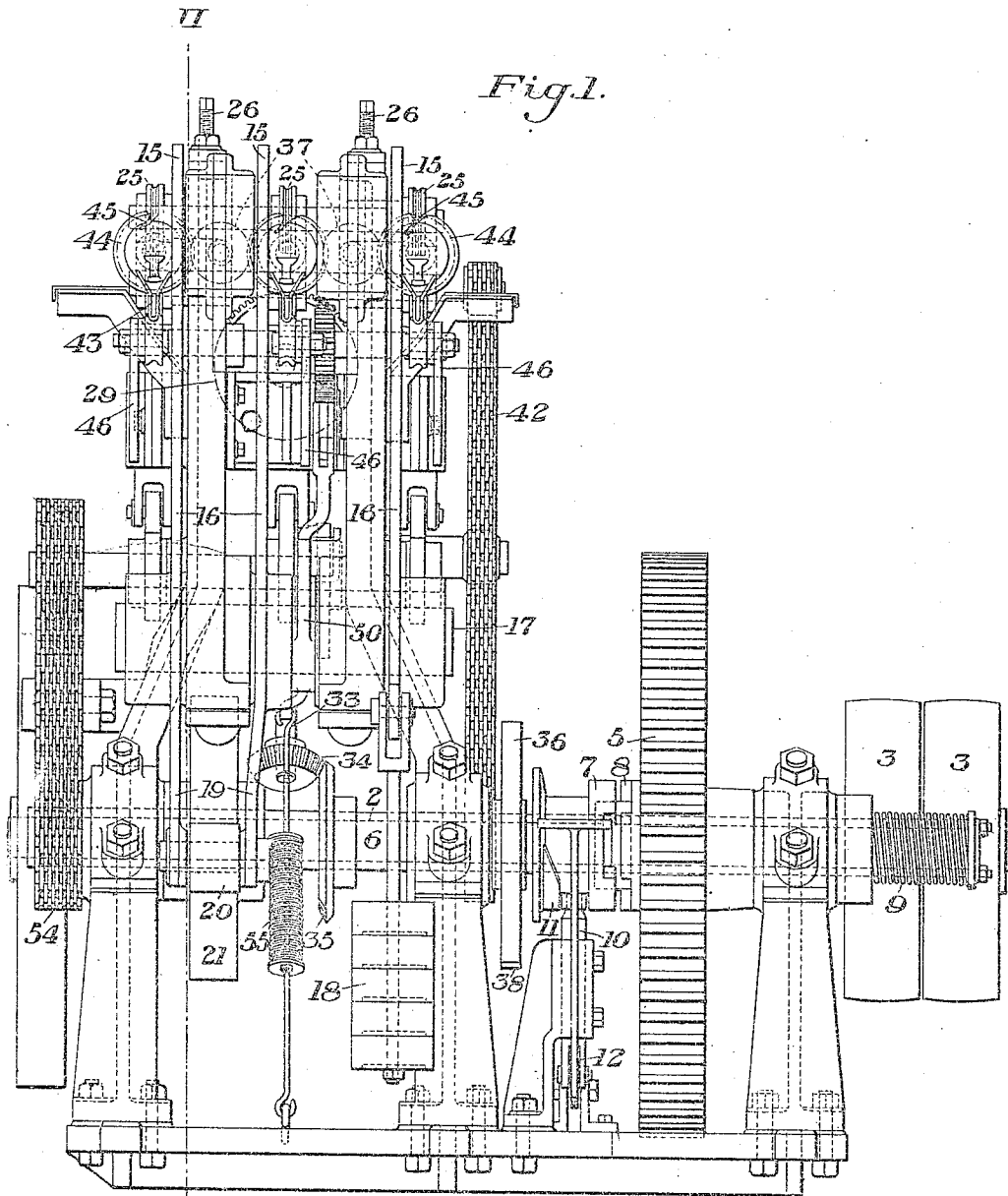


C. W. BENNETT.
MACHINE FOR BUNDLING SCRAP.
APPLICATION FILED MAY 17, 1909.

1,023,799.

Patented Apr. 23, 1912.

1 SHEETS-SHEET 1.



WITNESSES

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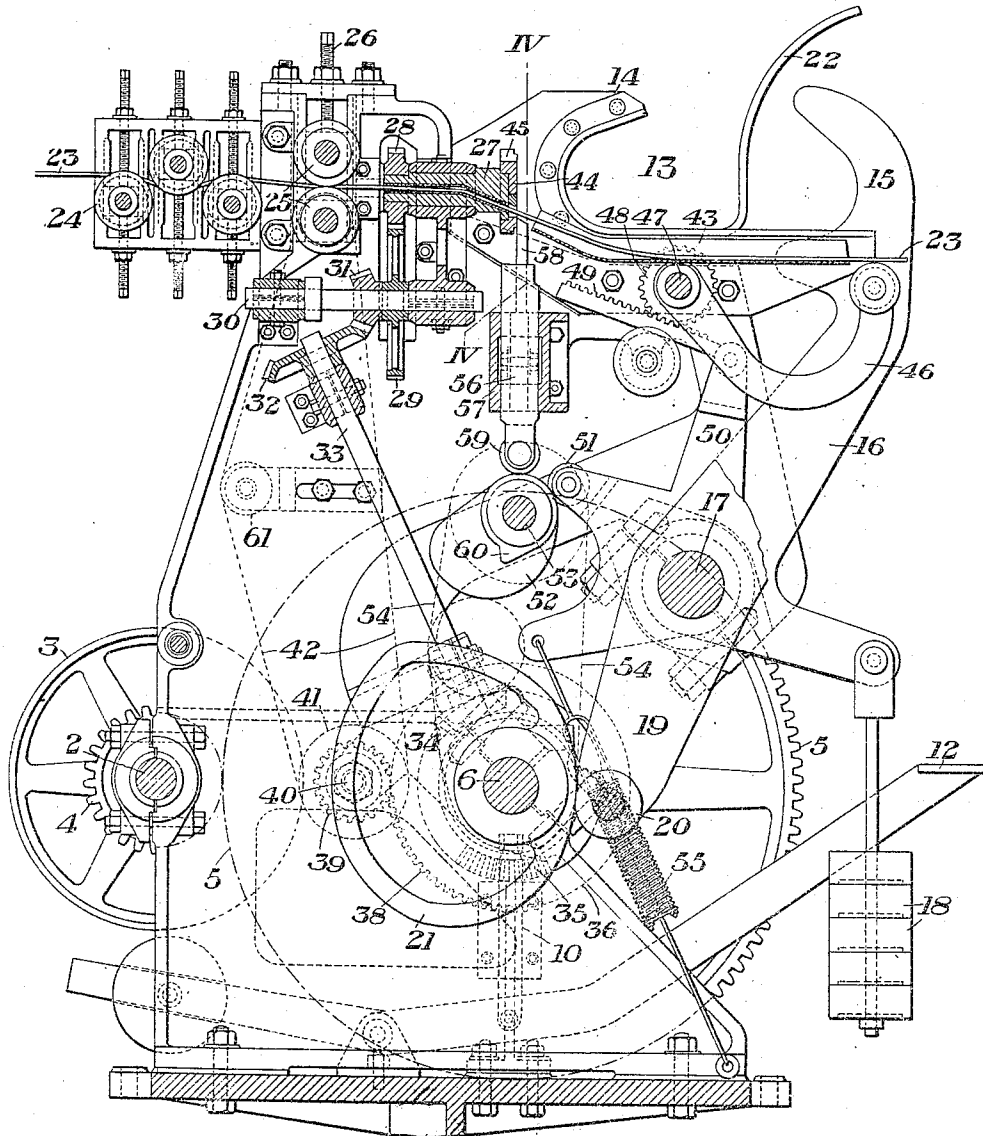
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4 SHEETS—SHEET 2.

Fig. 2.



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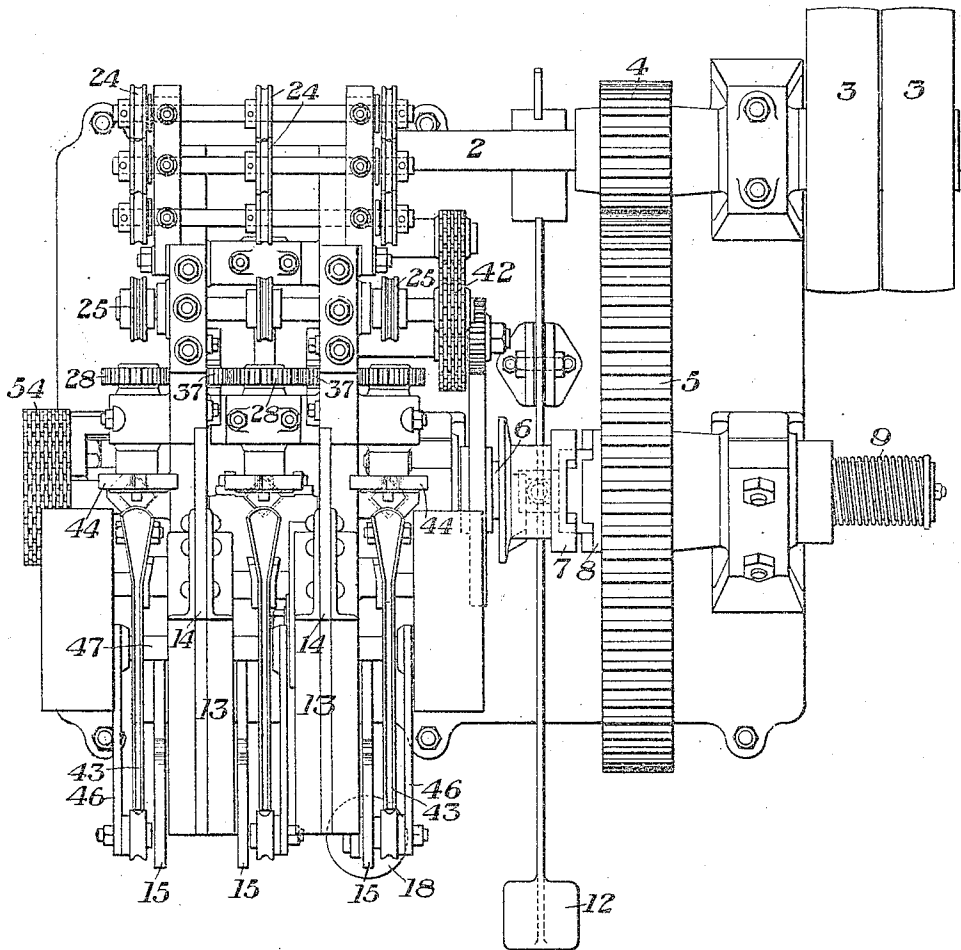
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4 SHEETS-SHEET 3.

Fig. 3.



WITNESSES

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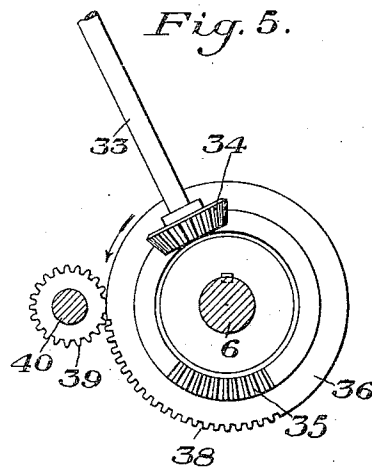
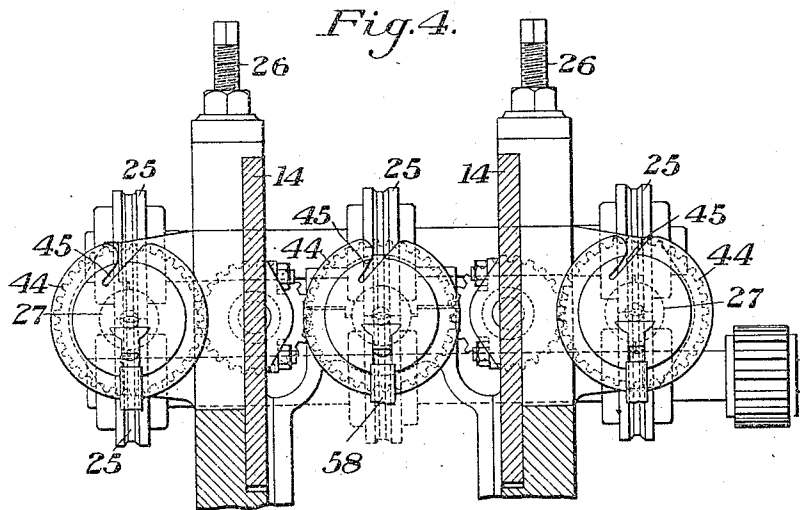
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4 SHEETS-SHEET 4.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR BUNDLING SCRAP.

1,023,799.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed May 17, 1909. Serial No. 496,468.

To all whom it may concern:

Be it known that I, CHARLES W. BENNETT, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Machine for Bundling Scrap, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of one form of machine embodying my invention; Fig. 2 is a section on the line II—II of Fig. 1; Fig. 3 is a top plan view; Fig. 4 is a detail section taken on the line IV—IV of Fig. 2 and showing the wire-twisting or tie devices; and Fig. 5 is a detail view of a portion of the gearing.

My invention has relation to machines for bundling metal scrap, and is designed to provide a simple and efficient machine of this character by means of which metal scrap may be rapidly bundled and the bundles properly tied or secured by the operation of the machine.

In these drawings, the numeral 2 designates the driving shaft of the machine, carrying the driving pulleys 3, and also a spur toothed pinion 4, which engages the large spur gear wheel 5 on the parallel shaft 6. The wheel 5 is rotatably mounted on the shaft 6, and is designed to be connected thereto through the medium of a clutch 7, which is arranged to slide into and out of engagement with a clutch hub 8 of the wheel 5. The clutch members are arranged to be thrown into clutching engagement by the action of a spring 9, and to be thrown out of engagement by means of a shifting rod 10, which coöperates with the cam surface 11 on the clutch 7. The shifting member 10 is connected to the foot lever 12.

13 designates a pocket or receptacle formed at the upper front portion of the machine, and into which the scrap to be bundled is to be placed. The rear wall of this pocket is formed by the overhung arms 14, and its front wall is formed by the series of fingers 15, which form extensions of the series of levers 16 rigidly secured to a rock shaft 17, one of said levers being counterweighted at 18, and another of said levers having a downwardly extending arm 19 provided with an antifriction roller 20 which is arranged to engage a cam 21 on the shaft 6.

I also preferably, although not necessarily, provide the pocket with one or more guide or guard fingers 22 for the purpose of preventing an undue amount of scrap from being placed in the pocket or receptacle at one time. The arms 14 and the fingers 15 have concave inner surfaces, for the purpose of shaping the scrap into a bundle of approximately cylindrical form.

23 designates one of the tie wires, a series of these wires being fed into the machine through a series of adjustable tension and straightening rollers 24 and between the upper and lower feed rollers 25, one of said rollers preferably being adjustably held in position by means of set screws 26. The tie wires then pass through the rotary twisting heads 27. In the machine shown in the drawings, three of these twisting heads are provided, as shown in Fig. 4, but it will be obvious that any suitable number may be employed. Each of the twisting heads is provided with a driving pinion 28, the pinion of the middle head being driven by a spur gear wheel 29 (see Fig. 2), on a shaft 30. The shaft 30 carries a bevel gear 31, which is driven by a bevel gear wheel 32 on an oblique shaft 33, whose lower end has a bevel pinion 34, which meshes with a mutilated or segmental bevel gear 35 on the shaft 6 (see Fig. 5). The pinions 28 on the side twisting heads are driven by the intermediate idle gears 37, as shown in dotted lines in Fig. 1.

36 is a mutilated or segmental spur gear on the shaft 6, which is arranged to drive a pinion 39 on a shaft 40. On the shaft 40 is a driving wheel 41, which is connected by a chain or other belt 42 with the shaft of one of the feed rolls 25.

The tie wires 23 pass obliquely through the front ends of the twisting heads, and thence downwardly through suitable guides 43 underneath the pocket or receptacle 13, as clearly shown in Fig. 2. On the forward end of each twisting head is a disk or plate 44 having a peripheral notch 45 into which the free end portion of the tie wire is adapted to be brought after it has been carried around and over the bundle of scrap to be tied. The tie wires are carried over and around the bundle of scrap by means of the pivoted swinging arms 46, which are secured to a shaft 47 underneath the pocket or recep-

tacle 13. This shaft is provided with a spur wheel 48, whose teeth are engaged by a toothed rack 49, connected to a bell crank lever 50, having an antifriction roller 51, which is in engagement with the cam 52 on the shaft 53 driven from the shaft 6 by a chain or belt 54, or other suitable means.

55 designates a tension spring connected to one arm of the bell crank 50 for the purpose of holding the antifriction roller 51 in engagement with the cam.

56 designates the cut-off slides, which are mounted to reciprocate vertically in suitable guides 57 (see Fig. 2), and each of which carries a cutter 58 at its upper end, which is for the purpose of cutting off the tie wire after each bundle has been tied. Each cut-off slide is provided with an antifriction roller 59, at its lower end, which contacts with a cam 60 on the shaft 53 before referred to.

61 designates an adjustable idler for taking up the slack of the belt 42.

The operation is as follows:—The scrap to be bundled is to be placed in the pocket or receptacle 13; and when a sufficient quantity to form a bundle has been placed therein, the operator depresses the foot lever or treadle 12; thereby throwing the clutch 7 into driving engagement with the hub of the gear wheel 5. This causes the shaft 6 to commence to rotate and the cam 21 to act upon the antifriction roller 20 to actuate the series of levers 16 to cause their fingers 15 to move rearwardly or inwardly toward the arms 14, thereby compressing the scrap into a compact approximately cylindrical bundle. At this time the cam 52 operates the bell crank lever 50 to actuate the rack 49 and thereby rotate the shaft 47 and swing the fingers 46 upwardly and over to carry the tie wires 23 around and over the formed bundle, these fingers depositing the free end portions of said wires in the notches 45 of the disk or plates 44 of the twisting heads. At this time the mutilated bevel gear 35 comes in engagement with the bevel gear wheel 34 and rotates the shaft 33, thereby rotating the series of twisting heads and forming the ties. The cams 60 now operate the slides 56, and thereby the cutters 58 to sever the tie wires 23 from the bundle. The toothed segment 38 of the wheel 36 then commences to rotate the pinion 39 to actuate the feed-in rollers to cause sufficient lengths of wires to be fed in to form the ties for the next bundle. As soon as one complete cycle of operations has been performed, if the operator removes his foot from the lever or treadle 12, the cam projection 11 of the clutch 7 will act to throw said clutch out of driving engagement with the clutch hub of the wheel 5.

The machine described forms simple and efficient means for bundling scrap, since ir-

regular pieces of scrap may be readily compressed into a compact bundle by the action of the fingers 15, and the formed bundles tied mechanically without the necessity for manual operations.

Various changes may be made in the details of construction and arrangement of the parts. Thus, the arrangement of the driving gear for the several mechanisms may be widely changed; different forms of twisting heads may be employed; the pocket or receptacle for the scrap to be bundled may be constructed in various ways, and numerous changes may be made within the scope of the claims.

I claim:—

1. In a machine for bundling scrap, a pocket or receptacle for the scrap to be bundled, mechanism for compressing or shaping the scrap into bundles, feed devices for feeding the forward end of a coil of tie wire around a formed bundle in said pocket, means for tying the bundle encircling wire into a loop and means for severing the formed loop from the coil; substantially as described.

2. In a machine for bundling scrap, a pocket or receptacle for the scrap to be bundled, members for compressing the scrap into a bundle, power means for actuating said compressing members, feed devices for passing the forward end of a coil of wire around the formed bundle, means for mechanically tying the end of the coil of tie wire around the formed bundles and mechanism for severing the tied wires from the coil; substantially as described.

3. In a machine for bundling scrap, a pocket or receptacle for the scrap to be bundled, means for compressing scrap placed in said pocket or receptacle into a bundle, tie wire feeding mechanism arranged to pass the forward end of a coil of wire around the formed bundles, means for tying the bundle encircling wires into loops and means for severing said loops from the coil; substantially as described.

4. In a machine for bundling scrap, a pocket or receptacle for the scrap to be bundled, a series of compressing and forming levers having fingers extending at the rear of the pocket or receptacle, means for actuating said levers, tie wire feeding mechanism, a movable finger or arm for carrying the tie wire around the formed bundle, and twisting devices for the tie wire; substantially as described.

5. In a machine for bundling scrap the combination with means for shaping the scrap into bundles, of a plurality of tie wire feeding devices having twister heads through which the wires are passed, said devices feeding the forward ends of the coils of wire around the formed bundles, means for rotating said heads to twist the wires

into bundle encircling loops or rings and means for severing the twisted wires from the coils; substantially as described.

6. In a machine for bundling scrap the combination with means for shaping the scrap into bundled form of means for feeding the forward ends of a plurality of coils of tie wire into the machine, a rotary twisting head for each tie wire, gearing for simultaneously actuating the twisting heads, means for carrying the forward ends of the tie wires around the formed bundles and engaging the free end portions with the twisting head, and means for severing the twisted wires from the coils; substantially as described.

7. In a machine for bundling scrap, a pocket or receptacle for the scrap to be bundled, a series of fingers for compressing the scrap and shaping it into a bundle in said pocket or receptacle, cam means for actuating the fingers, tie wire feeding devices, a series of fingers for carrying the tie wires over and around the formed bundles, gearing for actuating said fingers, a plurality of twisting heads through which the tie wires are fed, and gearing for rotating the heads, said fingers being arranged to engage the free ends of the tie wires with the twisting heads; substantially as described.

8. In a machine for bundling scrap, a pocket or receptacle for the scrap to be bundled, a series of fingers for compressing the

scrap and shaping it into a bundle in said pocket or receptacle, cam means for actuating the fingers, tie wire feeding devices, a series of fingers for carrying the tie wires over and around the formed bundles, gearing for actuating said fingers, a plurality of twisting heads through which the tie wires are fed, and gearing for rotating the heads, said fingers being arranged to engage the free ends of the tie wires with the twisting heads, together with cut-off devices and means for actuating the same; substantially as described.

9. Apparatus for bundling scrap having means for passing the forward end of a coil of tie wire around a formed bundle, mechanism for fastening the end of the bundle encircling wire to form a loop or ring, and means for cutting the formed loop from the coil; substantially as described.

10. Apparatus for binding bundled scrap comprising means for passing successive portions of a coil of tie wire around the successive bundles after the bundle forming operations, means for securing the end of the coil to form a bundle encircling ring or loop, and means for cutting the formed loop from the coil; substantially as described.

In testimony whereof, I have hereunto set my hand.

CHARLES W. BENNETT.

Witnesses:

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S. R. DETWILER.